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- Sustainable innovations that will transform the building industry
- Social justice issues as they pertain to the built environment on a local, national and global scale
- 2020 Sustainable Development Benchmarks: Where have we succeeded, where have we failed—and we go from here?
- The Built Environment Today: Are we designing and constructing properly for our changing climate and growing social and economic inequity issues?

SPEAKERS:

ANDREW WINSTON, globally recognized expert on how companies can navigate and profit from humanity's biggest challenges, and author of *Green to Gold*, *The Big Pivot*, and *Green Recovery*.

ED MAZRIA, founder of Architecture 2030 and internationally recognized architect, author, educator and visionary with a long and distinguished career.

RHIANA GUNN-WRIGHT, Policy Director for New Consensus, was one of the co-authors of the Green New Deal. A 2013 Rhodes Scholar, Gunn-Wright worked as the policy analyst for the Detroit Health Department and on the policy team for First Lady Michelle Obama.

GENE MYERS, CEO/founder of Thrive Home Builders, six-time winner of the Department of Energy's Grand Award for Innovation, and 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.

KALPANA KOTAGAL is a Civil Rights & Employment Litigation Partner at Cohen Milstein. She is also the co-author of the "Inclusion Rider," and is a highly-accomplished and award-winning plaintiffs' lawyer.

JAVON JOHNSON, Ph.D. is an Assistant Professor and Director of African American & African Diaspora studies at the University of Nevada, Las Vegas. Through performance poetry and the spoken word, Johnson creatively addresses crucial social justice issues.

HOME OF THE YEAR AWARDS DINNER : JANUARY 19

Green Builder® Media's annual Home of the Year Awards are recognized as one of the industry's most innovative and important programs that identify authentic, advanced, beautiful and sustainable projects and the professionals who design and construct them.

Green Builder® Media will celebrate our annual Home of the Year Awards winners at a special VIP dinner, held on January 19 at the elegant Zappos Bistro on Zappos Campus.

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EDITOR'S NOTE

The Inside Scoop

By Matt Power
Editor-in-Chief

Why Awards Still Matter

They're more than just a pat on the back—they steer the industry.

IT'S EASY TO BECOME CYNICAL in these times of information overload. Does anyone really care about awards anymore? Aren't we all so busy that we barely take time to look up from our phones and email and bills to applaud someone else's success?

If so, we're losing sight of the forest in exchange for studying the knots in a 2-by-4. It's not a good way to transfer knowledge. In fact, as Human Capital Media Vice President Mike Prokopeak points out,, the Association for Talent Development has found that 80 percent of knowledge transfer is forgotten. Worse, less than 15 percent of this knowledge is ever applied on the job.

This matters, he says, because the old model of learning things from a single teacher is outdated. We need peer collaboration, review and advice to really excel in our fields.

One way that we can still do that is with awards programs such as our annual Green Home of the Year Awards and Sustainability Awards. The nice part about these awards is that there's really no down side for entrants. If you win, your work is showcased and applauded in print and at our annual banquet. If you don't win, no one is going to call out your project for poor planning, lousy workmanship or bad taste.

The point is not to separate winners from losers, the way sports teams and corporations often do. Instead, our awards shine a spotlight on great projects that work, and let the judges—more peers from our industry—tell us how and why. Non-finalists can always come back next year, putting to work what they learned from this year's selected winners.

In other words, the whole process is designed to raise the bar overall for high-performance building professionals. Sure, there are other perks. A winner essentially get thousands of dollars' worth of print and online marketing clout for a couple hundred bucks to enter their project. They also get treated like royalty at our gala awards dinner in Las Vegas, and gain a little green credibility in their local market.

However, it's not just homes and developments we highlight with our awards. We also honor people. From the builders and architects themselves, to our "Sustainability Superhero" of the year, to outstanding product innovations and groundbreaking green cities, we honor and make public the hard work of dozens of sustainability leaders.

So yes, awards do still matter. In a time when getting someone's attention and holding it for a few seconds is the platinum standard of success, awards are one of the few ways to break through the chatter; to educate our peers without preaching. We need people to pay closer attention to what this year's winners are demonstrating: how to build more efficiently, reduce the footprint of our cities, and design shelter that's worthy of future generations. **GB**

CREDIT: GREEN BUILDER MEDIA

High style. Last year's winners enjoyed fine dining, networking and VIP treatment at *Green Builder*'s awards banquet in Las Vegas.

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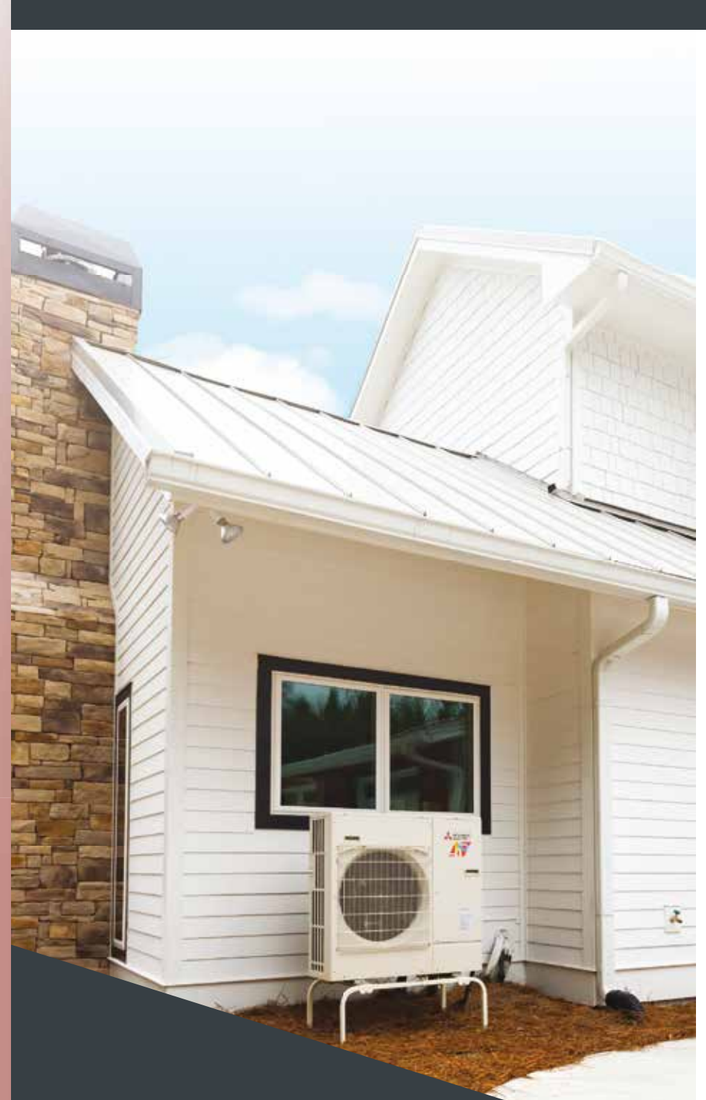

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Transition to Electric Living Will Supercharge Job Growth

The move away from fossil fuels will spur demand for about 100,000 skilled workers.

CALIFORNIA'S TRANSITION TO ALL-ELECTRIC HOMES and buildings could support more than 100,000 construction jobs and 4,900 manufacturing jobs annually for 25 years, according to a study by the UCLA Luskin Center for Innovation and Inclusive Economics on the employment impacts of building decarbonization. Upon 100 percent electrification, employment in the electricity industry will have increased by up to 12,400 workers while decreasing gas extraction and utility employment by a maximum of 14,400 workers.

In total, building electrification in California could support 64,200 to 104,100 jobs annually, after accounting for losses in the fossil fuel industry, according to "California's Building Decarbonization Workforce Needs and Recommendations." It is the first comprehensive study on jobs and decarbonization.

COURTESY OF ADOBE

Job prospects. Construction of all-electric buildings, such as the expansion of the Adobe headquarters currently underway in San Jose, will have major financial and public impacts on the California economy over the next 20 years.

Electrification is widely regarded as an effective way to cut climate pollution from homes and buildings, which are responsible for more than a quarter of the California's greenhouse gas emissions, Luskin researchers note.

"Modern electric induction stoves, water heaters and HVAC systems powered by clean electricity are more safe, efficient, reliable and higher-performing than gas," says Rachel Golden, deputy director of clean buildings at the Sierra Club, which commissioned the research. "But residents and businesses will not see these benefits unless California's skilled construction workforce is prepared for and engaged in this work over the next 25 years."

New Green Credentials for Talented Pros

Builders, architects and other construction experts now can earn a pair of competency ratings that demonstrate their commitment to the environment.

GREEN BUSINESS CERTIFICATION Inc. (GBCI) has unveiled two new reasons to seek out up-and-coming sustainability professionals. Originally developed by the International Society of Sustainability Professionals (ISSP), GBCI will maintain, promote and deliver the ISSP Sustainability Associate (ISSP-SA) and ISSP Certified Sustainability Professional (ISSP-CSP) credentials. Both provide third-party verification of competency in the field of sustainability and recognize individuals committed to making the world more economically, socially and environmentally sustainable.

According to Mahesh Ramanujam, president and CEO of GBCI and the U.S. Green Building Council (USGBC), the ISSP credentials identify professionals with the knowledge, skills and abilities needed to work in the field of sustainability in every industry and region.

ISSP-SA is designed for emerging sustainability professionals, including students, recent graduates or professionals looking to incorporate sustainability concepts into their career. ISSP-CSP designates an individual who has extensive experience in sustainability and who can demonstrate professional excellence in several key areas. Each credential is valid for two years and requires ongoing professional development.

CREDIT: ELVERT BARNES/FLICKR

Talent seeker. Persons with an interest in green building can gain recognition through a pair of new credentials from GBCI.

CREDIT: KMG664/ISTOCK

Bright spot. Skylights and the natural light they supply will be one of the top selling points for homes in 2020.

Wanted: Resilient Homes with a View

Tougher, more-unique and well-lit homes will be what potential buyers ask for in 2020.

COPING WITH CLIMATE EXTREMES, getting creative, and achieving better, longer-lasting performance that adds more return on investment (ROI) for home improvements are top of mind for U.S. and Canadian homeowners in 2020, according to the Metal Roofing Alliance (MRA). The Alliance has identified five key trends in North American housing construction for the new year:

SHOW OF STRENGTH. Toughening up a home's exterior to prepare for climate extremes is a very trending style for 2020. Instead of delicate detailing, heartier exterior features that offer a "fortress-like" feel and show off a home's rugged resiliency will be more popular than ever, MRA reports.

MIX AND MATCH. For a one-of-a-kind custom feel, homeowners are looking to their roofs as a canvas for creativity, MRA notes. The use of mixed metal color, styles and mixed mediums is trending. That includes metal roofing accents, and mixing and matching from among a huge range of shades available for metal.

SAVED BY ZERO. Net zero homes will continue to be all the rage. Their ability to produce energy savings isn't the only thing driving the demand; net zero homes are also typically designed to be more protected and durable, the association notes.

HI-FI CONTRAST. According to the latest MRA homeowner survey, metal is the second-most popular roofing choice, thanks to its style and design. Homeowners are highlighting those roofs with colors that call attention, rather than camouflage them.

SKY(LIGHT)'S THE LIMIT. Natural light is a major selling point for today's homes. Skylights will help further that trend, thanks to their ability to capture up to 30 percent more light than standard windows, and helping to keep rooms from feeling dark or cramped. **GB**

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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."

Seattle Cascades

VISION House® by Green Builder® Media

Imagine what your house would look like if the greatest minds in sustainability, performance, and design came together to build it – with the goal of remaining within your design parameters and budget.

THE EXPERIENCED PROFESSIONALS at Green Builder Media have joined forces with internationally-acclaimed building scientist and production builder CR Herro (VP Innovation, Meritage Homes) and pioneering green architect Stace McGee (Founder, Environmental Dynamics Inc) to create the VISION House Seattle Cascades: The House the Experts Built.

Located in Enumclaw, WA (the gateway to Mount Rainier National Park) the VISION House Seattle Cascades features the most advanced products, systems, and technologies to achieve extraordinary performance results – all at a reasonable price point. The net-zero, solar powered, high performance, resilient, healthy, and intelligent home boasts stunning design details, an open floor plan, and innovative materials.

Through meticulous planning, space is optimized to significantly reduce material use, jobsite waste, and cost. By deploying advanced building science and superior construction techniques, the home will exemplify resource efficiency and promote occupant well-being.

The result: a simple, replicable template that homeowners and builders can follow, based on decades of experience in the fields of green building, sustainable design, and building science.

FOR MORE INFORMATION:

Look for ongoing editorial coverage about the VISION House Seattle Cascades from Green Builder Media in the coming months. In the meantime, be sure to check out the project microsite at www.greenbuildermedia.com/vision-house-cascades for updated articles, videos, and news about the project.

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"As time goes by, more of the building product choices are being made, or at least heavily influenced, by other players in the transaction."

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ON THE COVER

Modern Design winner
Net Zero Retreat
Photo: James Leasure

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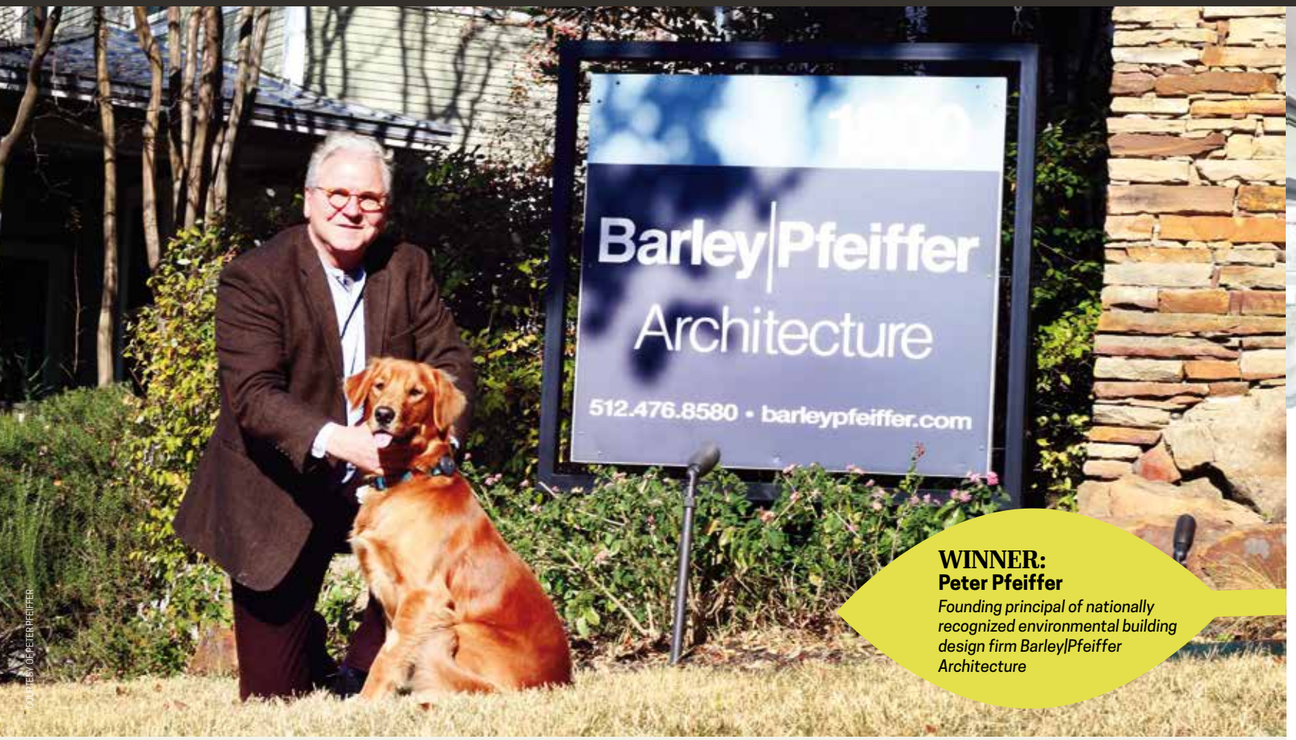
GREEN BUILDER®

Sustainability Awards 2020

BY GREEN BUILDER STAFF

Green Builder's annual Sustainability Awards recognizes people and companies that are leading by example when it comes to informing the public about why and how to go green. This year, we honor our Sustainability Superhero, Peter Pfeiffer; the cities of Austin, Santa Fe and San Luis Obispo as Sustainable Cities of the Year; and our nine Green Innovators of 2020. All are making huge strides in working toward solving environmental challenges. Congratulations to all of our winners.



CREDIT: COURTESY PETER PFEIFFER

WINNER:
Peter Pfeiffer
Founding principal of nationally recognized environmental building design firm Barley|Pfeiffer Architecture

All inclusive. Sustainability Superhero Peter Pfeiffer designs with nature, people and even canine friends in mind.

Industry Stalwart

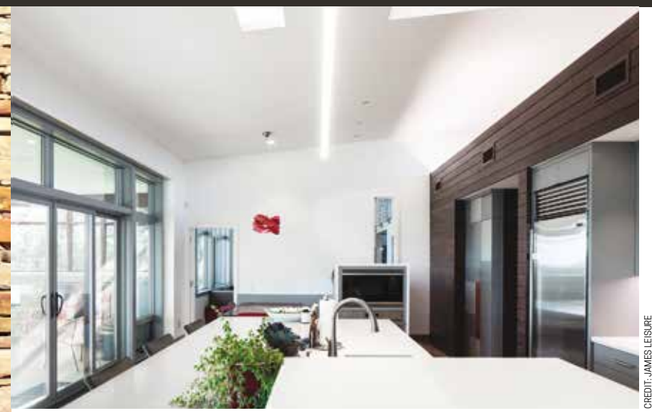
Peter Pfeiffer's four decades of building efficient, beautiful structures that are appropriate for their climates and locales has made an indelible mark on the industry.

WHEN IT COMES TO ARCHITECTURE, Peter Pfeiffer, Green Builder Media's 2020 Sustainability Superhero, is a purist. Serious about the fundamentals of sustainable design, his mantra is quite simple: "Design the built environment to be appropriate for its climate and location."

Not afraid to express his opinions—even if they're controversial, Pfeiffer openly laments that many building professionals and consumers have become so distracted by smart technology that they have forgotten about design essentials. "We've all become so attracted to the shiny nickel that we have abandoned the basics: building science and designing for environment."

Which leads him into a commentary on our social values. "We can't have sustainability without equality," he claims. "We can build the most visually stunning, functionally perfect, high-performance homes we want, but if people can't afford to buy and live in them, then what's the point?"

Indeed, buildings should provide opportunity, asserts Pfeiffer. He proudly points to one of his favorite projects designed by his firm, Barley|Pfeiffer Architecture: the Lost Pines Arts Center outside of Austin, Texas.



CREDIT: JAMES LEISURE

Zeroed in. The Net Zero Retreat (see story on page 36), designed by Pfeiffer, blends natural daylight, passive solar, energy efficiency, low maintenance finishes, excellent indoor air quality, and a harmonious response to the site's microclimate.

"The goal of this project was to revitalize the community spirit of a small Texas town where a quarter of its residents had lost their homes to devastating wildfires," says Pfeiffer. "We aspired to design a structure that would facilitate a vibrant arts community. We solved for energy efficiency, indoor air quality and daylighting, while reducing operating costs. We showed that good design can directly translate into cost savings for the building owners."

ROOM FOR IMPROVEMENT

While he recognizes that there are many excellent examples of sustainable design and construction across the nation, Pfeiffer implores the design and construction community to tackle climate action with a greater sense of urgency.

"We have to get serious about climate change," he avows. "We need to get back to teaching about climate sensitive design. It's fundamental, but it isn't taught in architecture schools anymore."

Instead, everyone has "jumped straight to green materials and smart technologies without reference to orientation, passive design and other key architecture elements that have a substantial impact on the performance of a structure."

He also bemoans the values of our throw-away society, and he is not afraid to pose some fairly provocative questions. "Our culture's massive overconsumption isn't actually making our lives better," he notes. "How much is enough? Do we really need 4,000-square-foot houses? Does every child need their own bedroom, bathroom and playroom? The way we live in our houses translates into our social values, and I'm not sure we're heading in the right direction."

He maintains that the design community needs to end its love affair with "options and shiny nickels" and get back to focusing on thoughtful, climate-sensitive design. He also wishes that organizations like the National Association of Home Builders (NAHB) would become more active in advocating for better building practices, codes, regulations and policy rather than "holding them back under the guise of affordability."

Like many other sustainable design and green building professionals, Pfeiffer struggles with the price per square foot valuation metric. "Lowest upfront cost doesn't lend itself to good sustainable design," he asserts. "We need to get appraisers, realtors and bankers onboard with promoting better design. But they're lazy—they want to base values and loans on lowest price, indicating that good design, efficiency and quality don't matter. That's just not right."

In contrast, Pfeiffer believes his business has the proper business attitude. "Homes should be designed to be lived in, not financed and sold," Pfeiffer proclaims. "We try to design from the perspective of how easy will it be for someone to own and operate home for the next 20, 30 or 40 years."

He also believes that the language of architecture can sometimes be supercilious, to the detriment of the public. "Let's speak in pain, forthright English," he says. "When we get too ostentatious about explaining what sustainable design means, people get confused. That's cruel, because it distracts people from the essence of good design, which, when done right, is indisputable."

A HERO IN THE MAKING

A Polish immigrant and product of the Great Depression, Pfeiffer was brought up with a "waste not, want not" approach to life. "I was taught at a young age to live efficiently, which has significantly

CREDIT: PAUL BARDAGJY

Night light. Instead of designing with climate change in mind—a mantra for Barley|Pfeiffer Architecture—today's designers focus too much on "options and shiny nickels," a trend that must be reversed for the sake of future generations, according to Pfeiffer.

SUSTAINABILITY SUPERHERO

Multi-purpose design. The super-efficient, sustainably designed Lost Pines Art Center boasts an art gallery, community gathering space, offices, studios, foundry, glass shop, ceramics kiln, coffee shop, artists' residences and gift shop.

CREDIT: PAUL BARDAGJY

impacted my approach to architecture," Pfeiffer says.

Pfeiffer, whose professional credentials in his 42-year career include architect, realtor, property manager and building scientist, has been committed to sustainability for most of his life. When he was in the eighth grade, he launched a newspaper recycling campaign and started studying passive solar design.

Soon thereafter, he immersed himself in the environmental movement. "It was an exciting time," he reminisces. "The Clean Air Act and Clean Water Act were being developed and environmentalism had a lot of momentum."

Early in his career, Pfeiffer served as an apprentice to the esteemed Paolo Soleri, a Frank Lloyd Wright disciple and pioneer of the sustainable architecture movement, who Pfeiffer heralds as his own hero.

Pfeiffer was instrumental in developing the Austin Energy Star program, America's first widely accepted community energy conservation program, and the Austin Energy Green Building Program. He also participated in the development of the NAHB's National Green Building Standard and the U.S. Green Building Council's LEED for Home rating system.

An accomplished author, speaker and educator, Pfeiffer spends much of his time teaching other building professionals about sustainable land development, environmentally appropriate design and green building.

He has also been instrumental in developing building science-based products that improve home performance, such as LP's *TechShield* and cool roof coatings.

Out of his esteemed body of work, Pfeiffer is most proud of being designated an American Institute of Architects (AIA) Fellow for "Mainstreaming Green Building in America"—a distinction only 1 percent of U.S. architects receive.

"I believe I was awarded this honor by my peers because they recognized my work to help normal people—with average budgets—take advantage of green building in a way that is meaningful," Pfeiffer reflects. "I have tried to strip away the lofty concepts of sustainable design, which are often beyond the reach of the average homeowner, and bring green to the mainstream."

His favorite project from his extensive portfolio is the Net Zero Retreat home, which just won a Home of the Year award from Green Builder Media (see story, page 24). "We blended the best of contemporary design and sustainability into a structure that is both cost-effective and works with the environment," he says.

But it's not all about work with this architect. When not designing, teaching, writing or observing building performance, you can catch Pfeiffer walking his dog, Tripp, or boating. **GB**

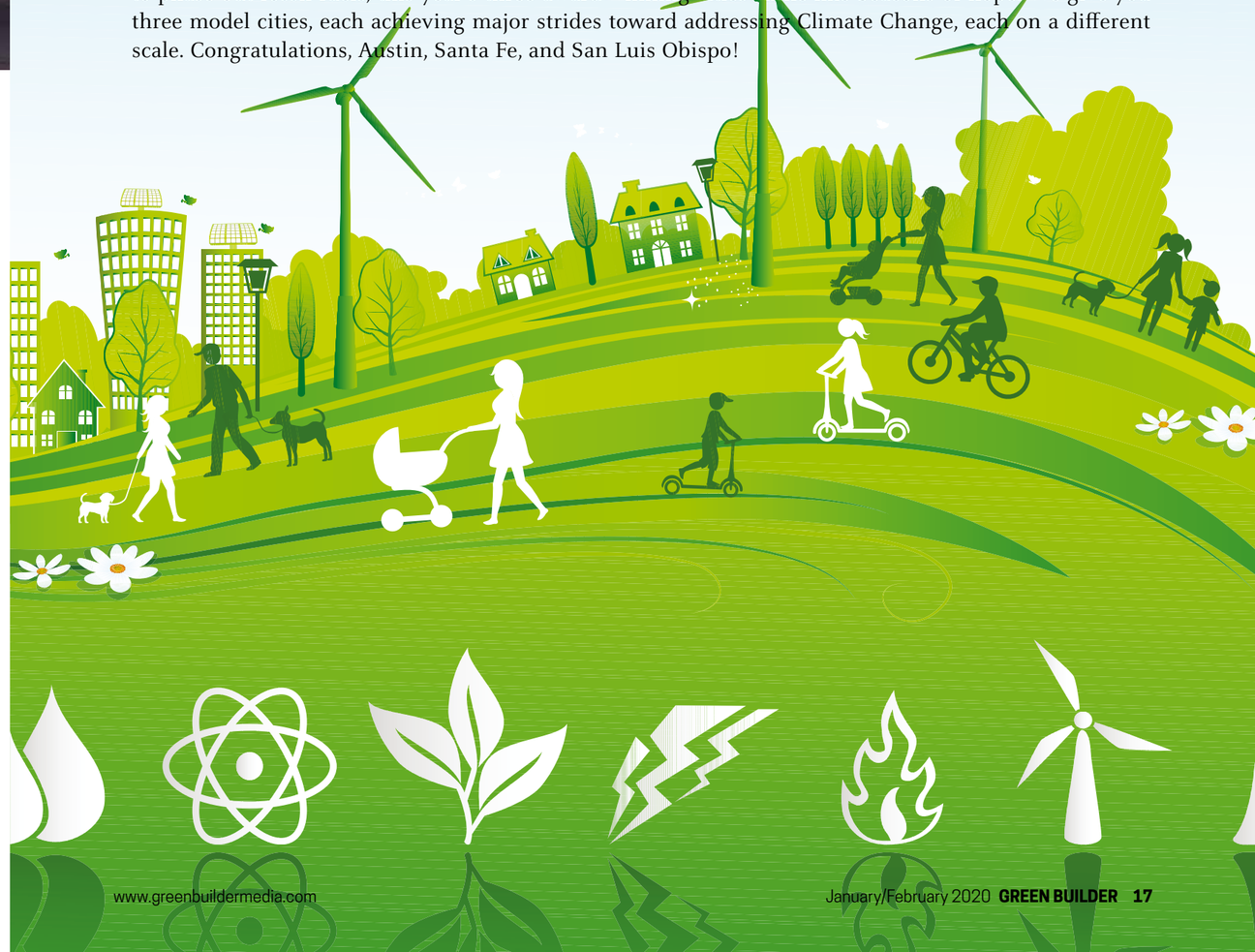
Superhero Stats

Some of Peter Pfeiffer's career accomplishments include:

- Being invited to be a Fellow of the American Institute of Architects (AIA) for "Mainstreaming Green Building in America"
- Being named "National Green Advocate of the Year" by the National Association of Home Builders (NAHB) for advancing the green/high performance land development.
- A citation in 2006 by *Residential Architect* as one of the "10 most influential residential architects of the decade."
- Developing *Kool Ply* radiant barrier decking in the 1980s, which later became *TechShield*.
- Developing the "Shading Umbrella metal roofing system," which Oak Ridge National Laboratories later determined to be "the second major advance in roofs for our century."
- Participating in the creation of Austin Energy Star, America's first widely accepted community energy conservation program.
- Continuing as a founding adviser to the nation's first green building program, Austin Energy Green Building.

Urban Oases

Although much of the world is actually losing ground in terms of CO_2 pollution and resource waste, some American cities are showing that a carbon neutral future can be achieved NOW. From simple steps such as EV charging stations and bike-friendly roads, to more-dramatic action such as changing building codes to phase out fossil fuels, this year's three award-winning cities shine like beacons of hope. We give you three model cities, each achieving major strides toward addressing Climate Change, each on a different scale. Congratulations, Austin, Santa Fe, and San Luis Obispo!



Big plans ahead. Austin gets a big thumbs up for taking action to address climate change on a large scale, while at the same time improving quality of life for all residents.
CREDIT: ROSCHETZKY PHOTOGRAPHY/SHUTTERSTOCK

Large Municipality: Austin, Texas POPULATION: 964,254

Thanks in large part to the efforts of Austin Energy, the city is well on target toward reaching net-zero by 2050.

THE CITY OF AUSTIN, not to mention its green-minded residents, has been out in front of most U.S. cities on sustainability issues for decades. Some on our staff remember showcasing the work of builder Ray Tonjes more than two decades ago, long before green building became the new normal.

It's no surprise, then, that Austin won this year's Sustainable City award in the category of Large Municipality. Part of what makes it exemplary is the way the local utility, Austin Energy (AE), has helped push the sustainability bar ever higher.

Electric vehicles (EVs) are a key example. "Our overall strategy regarding transportation electrification is to make it convenient, affordable, and green for Austinites to drive electric," notes Karl Popham, AE's manager of electric vehicles and emerging technologies. He cites a handful of examples: Unlimited access to 850-plus public charging stations; community-wide inclusive programs that include an educational curriculum, "EVs for Schools"; "The Electric Drive Showcase," which showcases the latest EV technology; an online EV buyer's guide; and an award-winning outreach campaign featuring stEVie, the "EV loving T-rex."

Sustainable city. A variety of forward-thinking educational and construction design programs has resulted in nearly one-fifth of Austin's residents now living or working in a green building.
CREDIT: STUART SEEGER/FLICKR

Taking the Lead

Efforts toward sustainability encompass almost every aspect of urban and suburban living in Austin, including:

- Bike lanes
- Bike sharing programs
- Residential composting
- Car-sharing programs
- Electric city vehicles
- EV charging stations
- LED street lighting
- Mixed recycling
- Noise abatement
- Renewable energy
- Stormwater catchments
- Traffic circles/roundabouts
- Water conservation
- Walkability
- Smart utilities
- Community gardens
- Green Building ratings and energy efficient buildings

More information: *City of Austin Green Building portal* **Austin Energy**

Austin's Community Climate Plan set a community-wide goal to reach net-zero carbon emissions by 2050. AE has taken the plan to heart with a series of initiatives, including:

Renewable power: AE has set its own goal of producing 65 percent renewable energy (90 percent carbon free) electricity to all customers by 2027, including 200MW of local solar. In fiscal year 2018, AE supplied 38 percent renewable energy to the general public. For customers looking for 100 percent renewable energy now, AE also offers GreenChoice®, the longest-running voluntary renewable energy program in Texas.

Over the course of the year, AE awarded 1,389 solar installation rebates, launched a shared solar pilot program and expanded its Community Solar program.

Energy efficiency: In 2018 alone, more than 800 homes were weatherized and another 840 homes participated in the city's home performance program with ENERGY STAR® rebates, thanks to AE programs and Energy Star coordination.

Green buildings: The City of Austin created the nation's first green building program in 1990. Austin Energy Green Building (AEGB) is now one of the nation's most-successful sustainable building programs, encouraging Central Texans to design and construct more-sustainable homes and buildings. In fiscal year 2018, AEGB rated 1,013 homes, 2,976 multifamily units, and more than 4.6 million square feet of commercial space.

In addition to promoting energy-efficient design and promoting AE's other programs and incentives, AEGB also supports and incentivizes a wide range of City sustainability initiatives such as its zero waste plan, the Complete Streets Policy, and water conservation and reuse.

The City of Austin, with the support of AE, pursues aggressive resiliency strategies, from stormwater management to wildfire-resistant construction, and encourages use of building materials and designs that improve occupant health and comfort. The program also plays a role in developing the City's energy code adoption process and providing support for code compliance efforts. More than 180,000 Austin residents—about 18 percent of its population—now lives, work, plays or learns in a green building.

Plugging customers into cleaner transportation: Austin also has adopted a Strategic Mobility plan. AE plays a key role, offering infrastructure rebates and services to improve convenience for drivers, businesses and developers interested in including EVs on their property. AE offers rebates for electric bikes, scooters, mopeds and motorcycles; the utility issued more than 1,200 rebates in 2018.

Drinking to success. Although Santa Fe restaurants already use less water than those in other cities nationally, they are now saving 120 million gallons per year through its pilot water reduction program.
CREDIT: CSFOTOIMAGES/ISTOCK

Mid-Sized Municipality: Santa Fe, New Mexico POPULATION: 84,612

Perhaps no city in the U.S. has a greater stake in water conservation than Santa Fe, and public officials have shown exceptional leadership on that front.

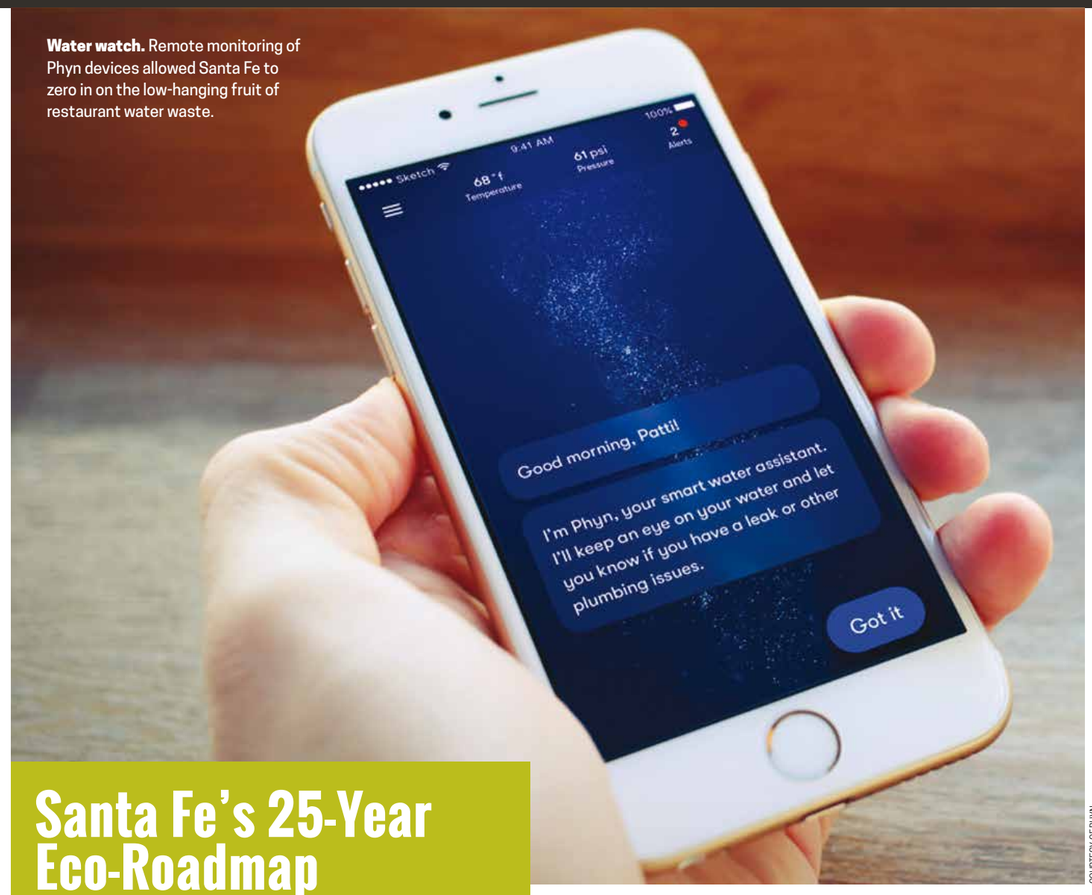
IT BEGAN WITH a California Energy Commission study. Researchers found that a restaurant will use, on average, 5,800 gallons a day or 2 million gallons a year. In an effort to change this, the City of Santa Fe conducted 30 restaurant audits in fall 2018.

The method was simple. Partnering with leak-detecting technology manufacturer Phyn, city officials were able to gather accurate and detailed information about the volume and frequency of water use from every appliance in each building.

The results were eye popping. Although Santa Fe restaurants use less water than the national average, at an average coffee shop the toilet is flushed 100 times a day, using more than 57,000 gallons of water per year. A busy restaurant sees up to 500 flushes per day, using more than 285,000 gallons of water each year. A single leak can waste 3,400 gallons of water annually if left undetected.

Restaurants were recruited by the Santa Fe Green Chamber of Commerce to make changes—and fast. The first pilot alone identified more than 1.5 million gallons of potential water savings, and directly resulted in annual usage reduction of 450,000 gallons, simply by

GREEN BUILDER Sustainability Awards 2020 SUSTAINABLE CITIES OF THE YEAR



Water watch. Remote monitoring of Phyn devices allowed Santa Fe to zero in on the low-hanging fruit of restaurant water waste.

COURTESY OF PHYN

Santa Fe's 25-Year Eco-Roadmap

Santa Fe has an ambitious 25-year sustainability plan in place. Among the many goals:

- Ensuring City government accountability, leadership and advocacy
- Coordinating education and outreach
- Maximizing energy efficiency
- Accelerating renewable energy
- Maximizing water conservation
- Developing/redeveloping in a more sustainable way
- Increasing options for affordable and workforce housing
- Transforming the transportation system
- Enhancing resiliency and regeneration of natural systems and processes
- Reinvesting in the local economy
- Empowering he next generation

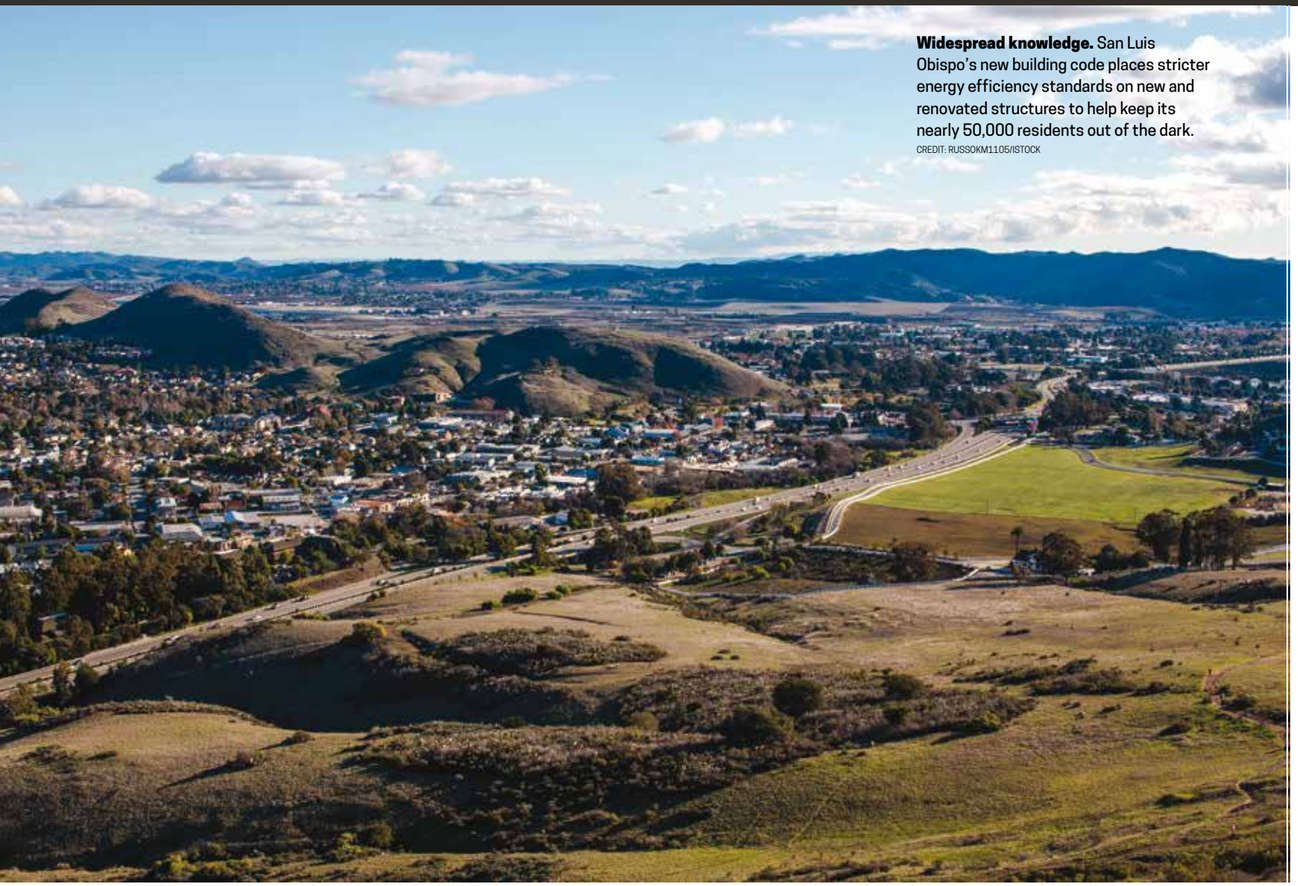
More information: City of Santa Fe

replacing aerators at each restaurant.

Having control over their water usage was a compelling reason for many of the restaurant owners to participate. "If we can't measure it, we can't control it," says Roland Richter, owner of Joe's Dining. "I'm glad they have finally provided us with a method for doing so."

The result? A reduction in the pilot restaurants' water usage of up to 20 percent, a rate expected to increase as the pilot program expands and additional data is captured. The implications can be huge: Santa Fe restaurants use more than 635 million gallons of water each year. A 20 percent reduction will save more than 120 million gallons of water in the first year alone, the City notes.

Following the pilot, the City of Santa Fe passed an ordinance to give a credit and full water audit to restaurants that install a *Phyn Plus* device. Phase 2 of this pilot is kicking off now, with focus on more restaurants and light commercial properties. The cost of the program will be offset in less than six months.



Widespread knowledge. San Luis Obispo's new building code places stricter energy efficiency standards on new and renovated structures to help keep its nearly 50,000 residents out of the dark.
CREDIT: RUSSOKM1105/ISTOCK

Small Municipality: San Luis Obispo, California POPULATION: 47,500

Bold action by the mayor and city council is just the latest of many progressive programs and actions that are raising the sustainability bar.

THE IDYLLIC CITY of San Luis Obispo could, like so many other towns across the country, go about business as usual, ignoring big-picture issues such as climate change. But thanks to a well-informed and active government, the coastal city is taking action now that will have positive implications for many generations.

What brought SLO to our attention was an (almost) unanimous decision by the city council to change building codes so that future homes would have to be built "all-electric." The benefits to this decision, for those unfamiliar with the concept, is that going forward, all buildings could be powered by renewable energy sources such as solar and wind, and break free from fossil fuel dependency.

According to the New Times, SLO's new code has three key components: "It requires mixed-fuel (natural gas) buildings to meet additional energy efficiency standards and be pre-wired for electric retrofitting; it introduces a "carbon offset program"—where a builder of a mixed-fuel building must complete an electric retrofit of an old building, or pay an in-lieu fee to the city to subsidize retrofits; and it mandates solar installations on nonresidential buildings.

"It exempts commercial kitchens, additions, attached accessory dwelling units and essential public safety buildings (such as a fire station)."

San Luis Obispo Mayor Heidi Harmon notes that the resolution is just one part of a larger plan for the city. "We're pursuing one of the most-aggressive decarbonization plans in the country," she says. "There are many more actions to come. GB

SUSTAINABLE CITIES OF THE YEAR GREEN BUILDER Sustainability Awards 2020

Free wheeling. The city hopes its community transportation policy will encourage at least 20 percent of residents to use a bike instead of a car to get around.
CREDIT: BIKE SLO COUNTY/FLICKR

Showing the Way

City officials in San Luis Obispo have already taken many steps toward hitting their goal of 100 percent carbon neutrality by 2035. Here are just some of their accomplishments so far:

- Identified climate action as a major City goal in 2017-2019
- Replaced all city street lights with LED bulbs
- Retrofitted the Water Resource Recovery Facility for energy efficiency, including a methane gas recapture plant to generate power
- Joined Monterey Bay Community Power to begin purchasing 100 percent carbon-free electricity in 2020
- Created a City staff "Green Team" to support implementation and collaboration
- Updated wastewater and water elements of the General Plan to include climate change impacts to supply
- Adopted new zoning to support EV chargers, tiny homes and infill development
- Purchased hybrid fleet vehicles and an electric bicycle fleet vehicle, and transitioned diesel fleet vehicles to renewable diesel
- Adopted a community transportation policy with the goal of taking 20 percent of trips on bicycle, 12 percent on transit and 18 percent walking, car pools and other forms of transport

More information: City of San Luis Obispo Clean Energy Choice

GREEN INNOVATIONS OF THE YEAR

Nine Worthies

This year's outstanding products demonstrate how sustainability can be enhanced when cloud-based apps and real-world engineering smarts converge.

Once again, we honor an elite group of manufacturers and products that are making real progress in reducing the impact of the built environment on our natural inheritance. They range from super-efficient heating equipment—easing the transition to renewable energy sources—to water-saving leak detection and responsive pool pumps. Our hope is that products like these, with help from smart technology, and durable, responsible choices in building materials, will steer us toward more-sustainable lifestyles in coming years. Let's take a look at this year's winners:

MANUFACTURER: Rheem

ULTRA LOW NOx GAS FURNACE

THE *ULTRA LOW NOx* gas furnace decreases nitrogen oxide (NOx) emissions by 65 percent, compared with the current standard offerings in the marketplace, and complies with the strict California mandate regulating stationary sources of air pollution.

In fact, Rheem's *Ultra Low NOx* is the first residential gas-fired furnace certified by the South Coast Air Quality Management District (SCAQMD) for Rule 1111. SCAQMD created the California mandate to reduce NOx in natural gas-fired, fan-type central furnaces from 40 nanograms per joule to 14 nanograms per joule.

Gas miser. The *Ultra Low NOx* from Rheem was engineered to provide energy savings and unmatched durability for users in the residential space.

The furnace was built with Rheem's exclusive direct spark ignition system, which is nine times more reliable than the industry standard hot surface igniters. This unique feature is the same ignition system used on commercial HVAC equipment and in gas home appliances, providing unmatched durability and years of worry-free operation.

More information: ***Rheem Classic Plus Series Ultra Low NOx Gas Furnace***

Manufacturer: Panasonic Life Solutions Company America

COSMOS HEALTHY HOME SYSTEM

WE FIRST ENCOUNTERED *COSMOS* at last year's Design & Construction Week (DCW) conference, when Star Trek-clad Panasonic staff gave us a starry-eyed tour of their vision for a new suite of indoor air quality (IAQ) products.

Cosmos rolls out this spring as a realignment of new and existing technology from Panasonic. This system's approach integrates indoor air filtration, pollution sensors and ventilation in new ways. Rather than a single product that meets "Healthy Home System" tests, *Cosmos* adjusts indoor air quality automatically and continuously.

Cosmos is a complete, professionally installed healthy home system. It continuously monitors four potentially harmful air quality problems: Volatile organic compounds (VOCs), 2.5 M. particulates, CO2, and relative humidity. When air quality is out of range, the unit will activate using Panasonic's *WhisperGreen Select*, *WhisperFresh Select* and *WhisperHood IAQ* to return air quality to normal levels. The *Cosmos* mobile app is loaded onto a smart device and is used to monitor system operation. The app can be also be used to control fan operation manually, when additional ventilation is needed.

The unit is fully customizable, adaptable to any size home.

More information:
Cosmos Healthy Home System
WhisperGreen Select
WhisperFresh Select
WhisperHood IAQ

Cloud control. Through a smart device app that communicates with sensors throughout the home, *Cosmos* offers consumers the ability to monitor their indoor air quality in real time.

Manufacturer: LG Air Conditioning Technologies

MULTI V 5 HEAT PUMP SYSTEM

HEATING AND COOLING represent the biggest energy users in most commercial buildings. For electric heating pump systems, the biggest technology hurdle has been performance in extremes of cold and heat.

The *Multi V 5* unit from LG, which includes the company's LGRED® (Reliable to Extreme Degrees) technology, can handle both scenarios. It also boasts an innovative system that allows for simultaneous heating and cooling in different zones. The space-saving design features higher-elevation piping technology, which expands the number of floors and piping distance runs allowed for installation. Moreover, with the help of sensors and adaptive programming, the *Multi V 5* fine tunes its processes automatically, further increasing energy efficiency. By enabling a building's HVAC system to function at optimal performance, the *Multi V 5* significantly contributes to the building's reduction of overall operational energy consumption, costs and, ultimately, environmental impact.

Extreme performer. With the ability to operate efficiently at extremes of cold and hot, this innovative HVAC unit from LG breaks new ground.

Unlike other variable refrigerant flow (VRF) products, the *Multi V 5* operates year-round in ambient conditions down to minus 22°F, yet also offers cooling capabilities for outdoor temperatures up to 122°F. Exclusive LG features such as Advanced Smart Load Control, Comfort Cooling Intelligence, and Smart Heating monitor real-time changing weather conditions. This enables it to make building load calculations to adjust operation and reduce energy consumption. Touting a 43 percent smaller average footprint than previous generations, the *Multi V 5*'s compact chassis utilizes a space-saving design that results in lower structural reinforcement costs.

More information: LG *Multi V 5* Heat Pump System

Manufacturer: Niagara Conservation

NANO SUPER-EFFICIENT TOILET

THE *NANO*, a high-efficiency dual-flush toilet, aims to vastly reduce the amount of water wasted by everyday users. With toilets making up 24 percent of a household's water use, reducing the flush volume easily allows for water savings. And, careful design innovations allow this unit to perform its essential feature without clogging.

With flush options of 0.5 and 0.8 gallons per flush (GPF)—much lower than the industry standard—the *Nano* beats even the 1 GPF models from competitors that have begun to show up in the marketplace. Niagara's secret is a flushing system they call *Stealth*. It's a well-tested and effective discharge system that pressurizes water to remove solids more efficiently. This reduces the risk of clogs, yet is not overly loud in the flush or the refill phase.

Both of the dual flush options of the product meet and exceed *WaterSense* standard, and save up to 82 percent more water than less-efficient products. Such a reduction in water use also assists properties in meeting standards required for green lending and net-zero building.

More information: *Nano* Dual Flush Elongated Toilet

Powerful boost. A vacuum assist and noise-absorbing chamber work in tandem, allowing the *Nano* to use less water per flush, yet still do the job.

Manufacturer: Noritz America

NRCR CONDENSING TANKLESS WATER HEATER

WE'VE MET SOME OF THE engineers from Noritz over the year, and they take their job as innovators and quality controllers seriously. When you remove the cover from one of their gas hot water heaters, it looks like the work of a talented watchmaker-turned-engineer.

The *NRCR* condensing tankless water heater reduces resource waste by combining the high efficiency of condensing technology hot water recirculation. A fully integrated circulating pump inside the *NRCR* keeps hot water close to even the most distant outlets in the home, minimizing waste of unused potable water. The *NRCR* heats water strictly on demand, saving energy by eliminating the need to constantly reheat a full storage tank, as with a conventional water heater.

Moreover, the *NRCR* condensing tankless water heater is made of longer-lasting materials. For example, the unit's two heat exchangers are high-grade stainless steel, so Noritz can offer a 15-year warranty and extend the life cycle of the product.

The *NRCR* also comes with a five-year warranty on parts, and one full year on labor.

More information: Noritz NCR-0919

Manufacturer: LeakSmart

LEAKSMART LEAK DETECTION TOOL

LEAKSMART is a leak detecting system designed to automatically prevent water leak disasters.

The innovation that brought *Protect by LeakSmart with Flow* to our attention is its auto-shutoff capabilities. The manufacturer says that when unwanted water is detected, the *LeakSmart* sensor springs into action, sounding an alarm, sending an alert and prompting the system's valve to shut off the main water supply. This fast response fits our "green" criteria, because exploded pipes can do rapid and costly damage, resulting in significant waste of resources for repairs and replacement of floors, walls and ceilings. About 40 percent of damaging leaks come from appliances, 40 percent from in-wall leaks and 20 percent from natural flooding.

Damage prevention. The *LeakSmart* system shuts off your main water supply when it detects a leak, and works with *Control4*, *Google Assistant*, Amazon *Alexa* and Google *Nest*, Samsung *SmartThings* and *Wink*.

Another innovative feature of this system is its ability to continue monitoring for leaks during a power outage, as long as you provide battery power for two key components: the hub and the shutoff valve. The shutoff valve requires four AA batteries, but you'll have to provide your own battery backup for the hub. An uninterruptible power supply (UPS) for a computer should work.

Home builders and homeowners alike are protected with *LeakSmart*'s five-year manufacturer's warranty when purchased and installed by a professional installer.

More information: LeakSmart

Manufacturer: Speck Pumps

A91-II VSP - 1.1 THP SELF-PRIMING POOL PUMP

SWIMMING POOLS WASTE a shocking amount of electricity in the U.S.—as much as $23 a week— for the simple reason that older pool pumps are far less efficient than modern ones such as the one highlighted here.

The *Speck A91-II* variable speed pump (VSP) operates at an efficiency of up to 95 percent above that required to qualify as an ENERGY STAR® product.

It accomplishes this feat through flexibility. The 1.1 THP variable speed motor has a built-in controller, LED screen and keypad that can be locked for safety. Most importantly, in terms of power use, it operates at three adjustable power levels. These levels can be set to range from 50 watts/1,000 RPM to 1,000 watts/3,500 RPM (in increments of 10 watts). Power is provided by a maintenance-free permanent magnet brushless 48 frame motor.

The typical pool pump motor is an induction motor with efficiencies of 35 percent to 70 percent. VSP motors such as this one operate at lower speeds, producing efficiencies in the 90 percent range. This innovation can cut daily energy consumption from 12 kwh to 2 kwh for the average pool pump.

Pool partner. This variable speed pool pump from Speck offers energy performance up to six times better than a typical single-speed pump.

More information: *Speck A91-II VSP* Dual Voltage Swimming Pool Pump

GREEN INNOVATIONS OF THE YEAR

Manufacturer: AMICO

HYDRODRY SELF-DRAINING VENTED WALL SYSTEM

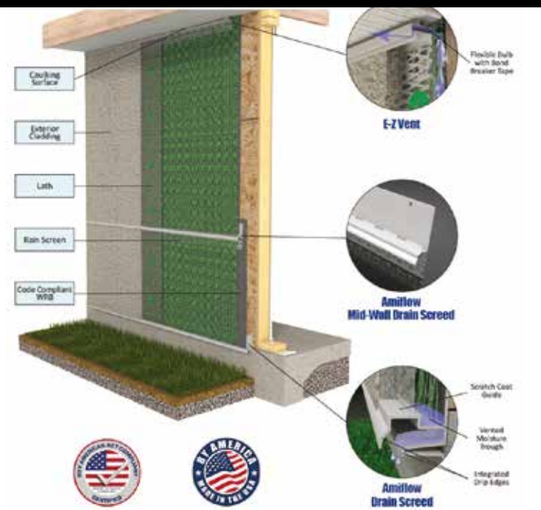
AMICO (Alabama Metal Industries Corporation) has just launched *Hydrodry*, a self-draining vented wall system for use behind veneer stone, stucco and masonry siding.

This innovative product creates a dedicated drainage and ventilation cavity behind exterior walls—with patented profiles that allow the wall to both vent and drain—extending its useful life by drying and creating continuous airflow throughout the wall cavity.

Moreover, *Hydrodry* accommodates draining over doorways, windows, sill stones, roof pitches and other detailing.

The best way to understand how the *Hydrodry* moisture management system works is to visit the product website and watch the brief intro video that shows various types of materials being used on top of the drainage materials.

More information: *Hydrodry* Moisture Management Solution



Separate by design. The *Hydrodry* moisture management system creates what is essentially a standalone chamber on the outside of the building, where materials such as stucco and stone encounter water and weather and manage it without involving the building envelope.

Manufacturer: A.O. Smith

PROLINE ELECTRIC TANKLESS WATER HEATER

FOR MANY YEARS, electric tankless hot water heaters could not find their niche in the U.S. market, due in part to their heavy demands on electrical circuits.

These technical challenges have been addressed, however, and new electric-on-demand products are now hitting the market. Among them is A.O. Smith's *ProLine Electric Tankless* water heater line. The company, known for its hybrid heat pumps, has added some smart features for its entry into on-demand electric hot water, including "Dry Fire Protection." Long overdue, this feature makes sure the heating element will not turn on unless the tank is full of water. Also, all models have Scale Reduction Technology. This feature reduces scale formation on the elements and on the chamber walls, extending durability of the unit. Further, the units do not contain any moving parts or screens—further reducing the likelihood of scale-related service problems.

Voltage control. With technology that gradually ramps up electricity demand, this new tankless product solves one of the major hurdles to on-demand electric hot water units in the U.S.

The *ProLine Electric Tankless* is available in three sizes, with 45 different models ranging from 2.4kW to 32kW, and Uniform Energy Factor up to 0.93. The units are available in a variety of voltage options: 120V, 208V, 240V, and 277V.

Key to this innovation is a preheat function that reduces the call for a large "surge" of electricity when water is called for. In the manufacturer's words, this "soft start power draw" makes sure that the lights in the home do not dim during a heavy power draw.

The largest unit in the family, the four-chamber model, can produce up to 4.25 gallons of hot water per minute—enough to support 2.5 baths in a whole-home or multi-family application. The two-chamber design is ideal for applications where the heater is close to where the hot water is being used, such as remote laundry rooms, guest houses or other accessory dwelling units (ADUs).

More information: A.O. Smith Hot Water Heaters

12TH ANNUAL

Green Home of the Year Awards

PREPARED FOR NATURE'S WORST.

The winners in this year's Green Home of the Year Awards share numerous traits–sustainability-focused construction materials, limited negative impact on the local environment, the latest ENERGY STAR® appliances. But the one trait stressed in every winning home is energy resilience. Whether it's to keep household bills low or ensure the lights stay on after a natural disaster, a green grid is the best grid.

Our expert panel of judges evaluated projects in terms of overall sustainability, resilience, synergy with the environment and surrounding neighborhood, affordability, creativity and the depth of science employed. Here are their choices for the six most exemplary and imaginative green homes.

THE JUDGES

NATHAN GOOD is a Fellow of the American Institute of Architects (AIA), a National Council of Architectural Registration Boards (NCARB)-registered architect, NCIDQ-certified interior designer, and LEED-accredited professional. He specializes in projects that bridge environmental performance with character and aesthetics. His firm has received design awards from AIA, the National Association of Home Builders and *Green Builder* magazine, among others.

GENE MYERS is CEO and Founder of Thrive Home Builders, six-time winner of the Department of Energy's Grand Award for Innovation, and 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.

TIM O'BRIEN is president of Tim O'Brien Homes. The company, which specializes in building green and energy-efficient housing, has received Silver and Gold National Housing Quality (NHQ) awards. In 2018, the company broke ground on Wisconsin's first net zero energy neighborhood, Red Fox Crossing, in New Berlin. O'Brien has also coordinated homebuilding projects with several Waukesha-area high school construction trades for the past nine years.

Empowered Perfection

The Monroe Farmhouse showcases outstanding attention to energy, ventilation and heat management.

BY GREEN BUILDER STAFF

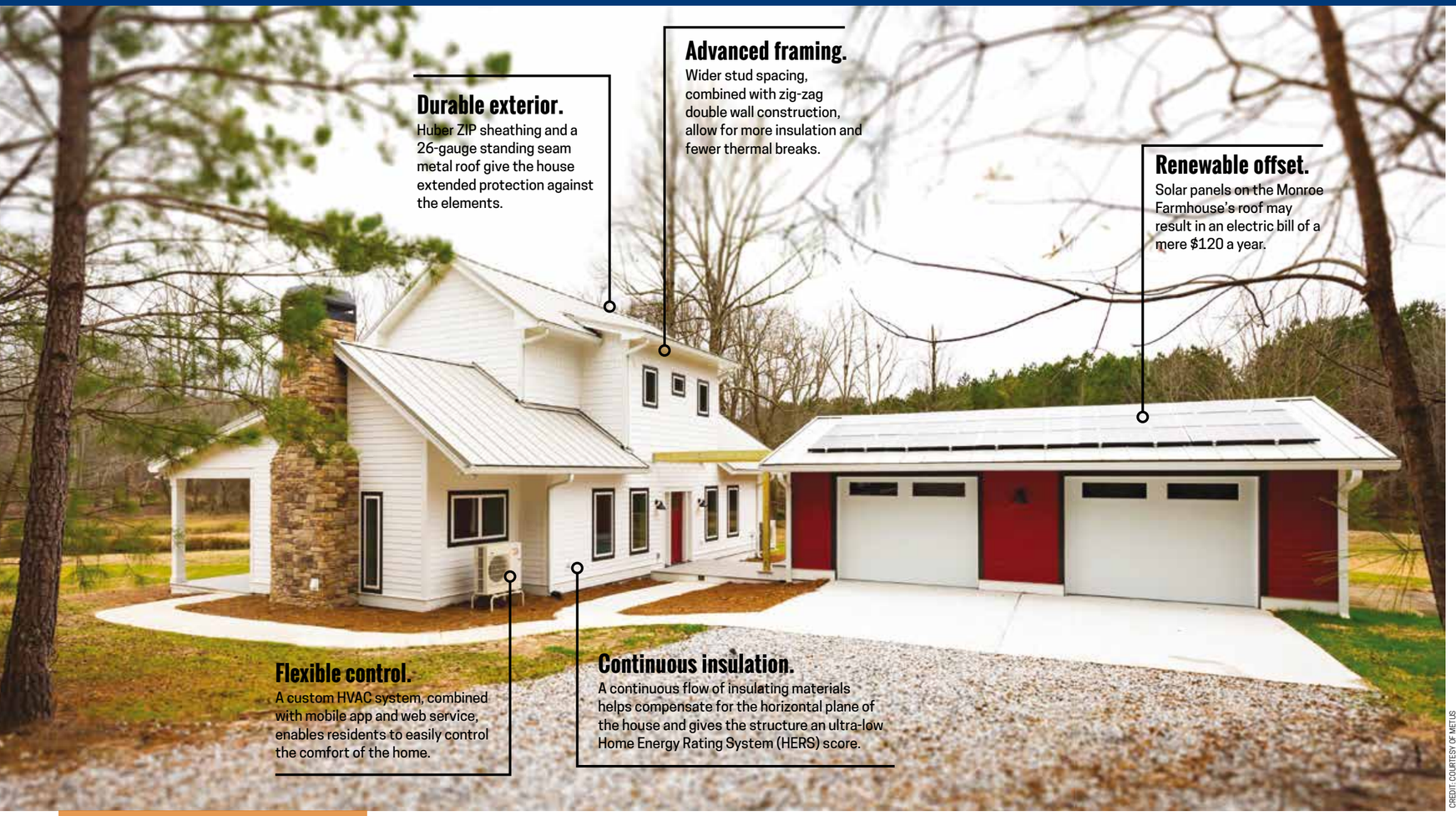
WHAT WOULD IT BE LIKE to never pay a power bill again? Mark Kuntz, chief executive officer of Mitsubishi Electric Trane HVAC US (METUS), wanted to find out. After buying an 11-acre property in Monroe, Ga., he wanted to meet three goals: build a house that consumes little energy; incur no debt; and utilize materials that are durable and relatively maintenance free.

Kuntz chose Imery Group as the builder. The Athens, Ga.-based company has been installing Mitsubishi Electric HVAC equipment since 2011 and is dedicated to the green building movement.

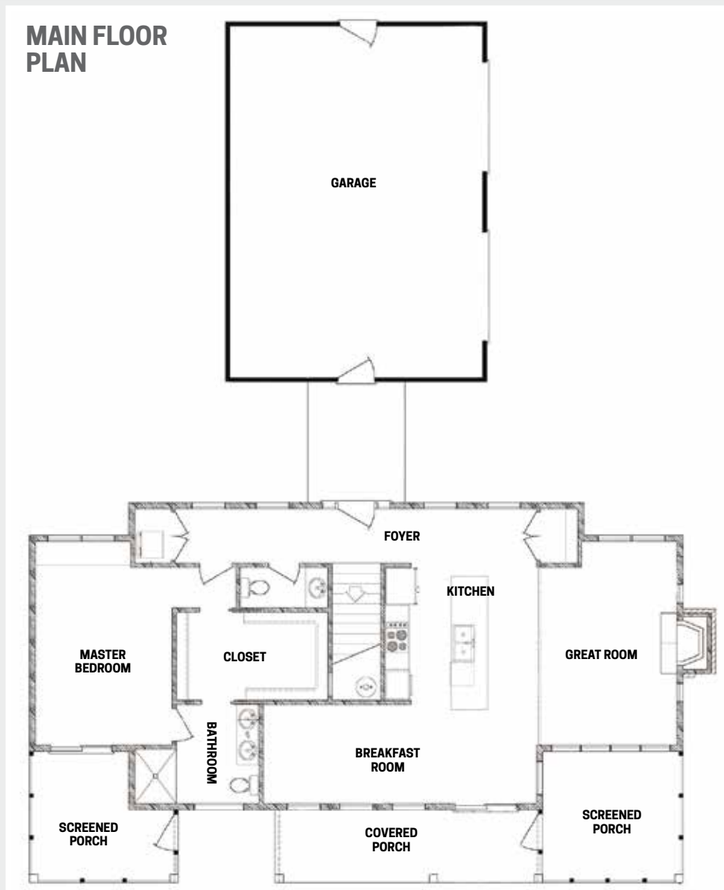
"Everything we do as a company focuses on value and quality," says Imery Group owner Luis Imery. "[We emphasize] the economic value of a high-performance building, as well as the social and environmental values to the greater community."

After assessing Kuntz's goals and the property, the team set its sights on building a U.S. Department of Energy (DOE) Zero Energy Ready Home. "This home recognition essentially means that we maximized our efforts and did everything we could to make the house as healthy and energy efficient as possible, prior to the incorporation of renewable energy," explains Imery.

CREDIT: COURTESY OF IMERY GROUP



CREDIT: COURTESY OF METUS



FROM THE JUDGES

"This home seems to be in its own world. With a great deal of natural vegetation remaining on the site, in Georgia's climate, this home will seem tucked into nature in just a few years."

A SEALED DEAL

With these criteria in mind, the project team planned the thermal envelope and mechanical system design for the 1,863-square-foot, two-story home. "For a home like this, you always start with the building envelope: the exterior walls, the roof and the foundation assembly," notes Imery. "For Mark's house, we wanted to have a continuous and airtight thermal envelope. That means insulation that goes around the foundation, the walls and the ceiling, all in a continuous form."

Imery Group installed below-grade slab insulation to accommodate the horizontal plane of the house. The walls are covered in *ZIP System*® R-sheathing from Huber Engineered Woods, and the studs are staggered in a zig-zag pattern.

The home was further insulated with spray cellulose, a recycled paper product. The combination of these materials effectively prevents air leakage, allowing the mechanicals to perform optimally.

"The less wood you have touch the exterior of the home, the more efficient it will be, which is why we used the insulated sheathing and staggered stud walls," notes Imery. "On a conventional 2-by-4 wall, you typically place studs 16 inches on center. In this case, we did 2-by-6 walls—allowing us more insulation—and staggered the studs 24 inches on center for the exterior and 24 inches on center for the interior, offset 12 inches apart."

Once assembled, the roof and walls were rated by an R-value, the rate by which a material's heat flow resistance is measured. The walls were rated at R-28 and the roof R-50, significantly higher than code requirements for new builds.

IN WITH THE GOOD AIR

Next up was the HVAC design. The METUS Performance Construction Team (PCT) and Imery Group brought in energy and HVAC consulting firm Energy Vanguard to collaborate on the layout and load calculations of the mechanicals.

"When you're building any new home, calculating the heating and cooling loads is important to do from the start," says Energy Vanguard President Allison Bailes III. "Room by room, you measure the loads so that you can then determine the total size of the equipment appropriate for the home. Then there's the ducting to factor in. Whether a system's ducted or ductless, you'll have to make sure air is distributed properly."

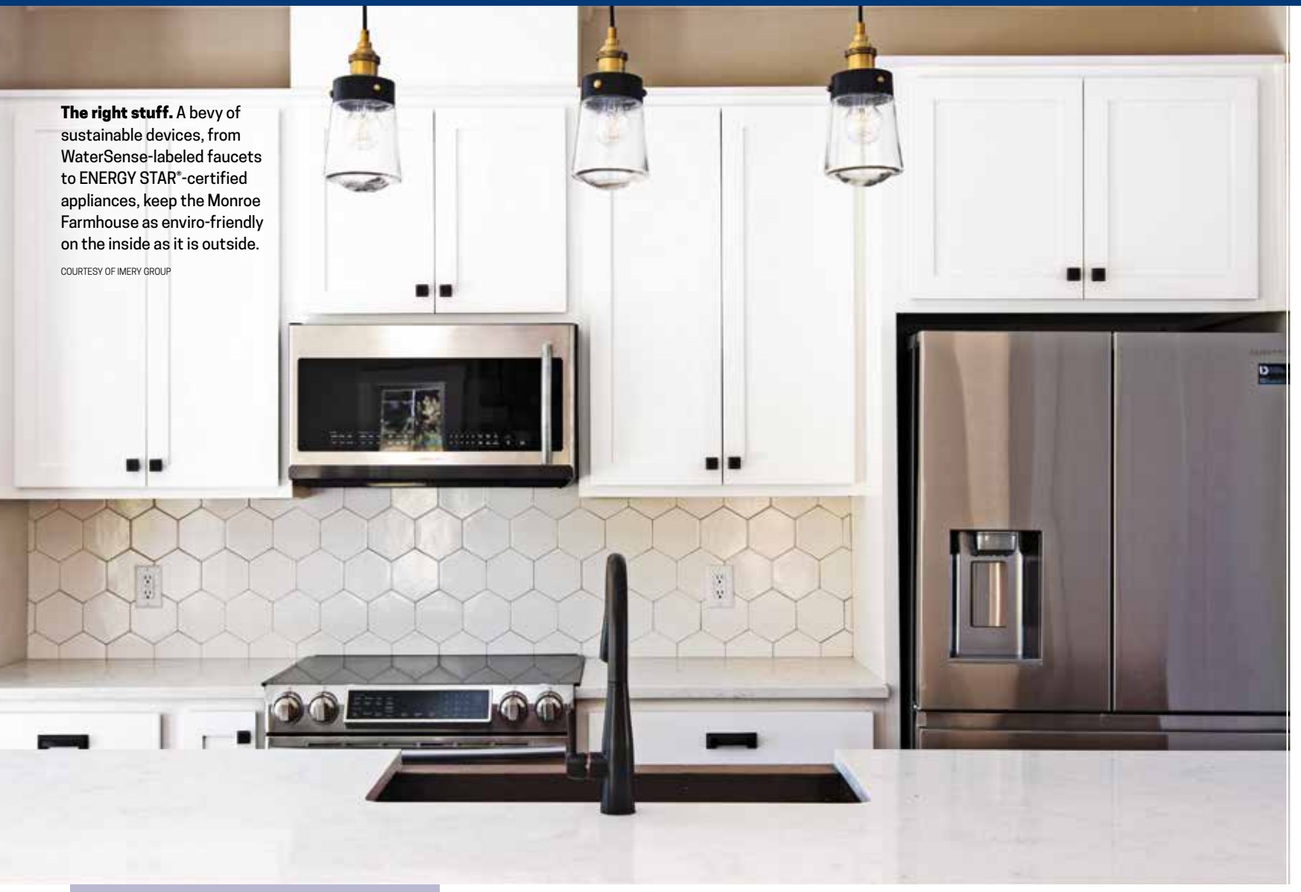
Ultimately, the team decided upon three *MSZ-FH* wall-mounted indoor units (one for each bedroom) and one *PEAD* horizontal-ducted indoor unit to condition the first level of the home. Mitsubishi Electric's mobile app and web service, *kumo cloud*®, was also installed so that Kuntz and his family can control the comfort of the home from their preferred smart devices.

Imery Group also installed a third-party energy recovery ventilator, a dehumidifier and photovoltaic solar panels based on their experience and recommendations from the METUS PCT.

A HOT PROSPECT

One other game-changing product was installed that further assists in making the home ultra-efficient: a prototype hot water heat pump from Mitsubishi Electric. The unit captures the heat from the outdoors, eliminating the need for the HVAC system to compensate for heat loss that might occur indoors.

"So far, we've been getting good performance results. We're hitting the energy factor level that a lot of utilities are looking for with hot water heat pumps," says Kuntz. "It's a split system, half outdoors—so



The right stuff. A bevy of sustainable devices, from WaterSense-labeled faucets to ENERGY STAR®-certified appliances, keep the Monroe Farmhouse as enviro-friendly on the inside as it is outside.

COURTESY OF IMERY GROUP

Project Stats

NAME: Monroe Farmhouse, Monroe, Ga.

BUILDER: Luis Imery, Imery Group

PHOTOGRAPHER: Imery Group; Mitsubishi Electric Trane HVAC US (METUS)

it's not cannibalizing heat—and half indoors to provide hot water, and heating and cooling to the rest of the downstairs space. When in air-conditioning mode, it's capturing heat inside the house and putting it in the water. It's essentially gathering free heat."

Extending the concept of free energy a bit further, Kuntz also had an electric car charging station installed in the garage and plans to one day add a bi-directional charger. "My expectation is to provide living and transportation energy on a net-zero basis," he says. "With the solar panels installed, the expectation is that my energy generation will offset my usage, including my electric vehicles."

EXTREME EFFICIENCY

Since the home's completion in December 2018 and review by a third-party green verifier, Home Performance Solutions, the residence has exceeded the entire project team's expectations. With the solar panels, the home has a confirmed Residential Energy Services Network (RESNET) Home Energy Rating System (HERS) Index score of minus 13. For a conventional, new build home, RESNET references a HERS score of 100. The Georgia Building Code goes even further, requiring a HERS index of 90.

The home also officially meets DOE Zero Energy Ready Home, ENERGY STAR®, EPA Indoor airPLUS and EarthCraft™ certifications, and exceeds the 2009 and 2012 International Energy Conservation Code® (IECC).

In addition, with the solar panels, Kuntz's projected energy costs per year total $120. That's an annual savings of $2,837 compared to the average, new U.S. home. According to the Zero Energy Project, the total cost of ownership of a zero-energy-ready home is less than that of a similarly sized, conventional new home—not to mention, an environmentally conscious decision.

With such great energy savings, Kuntz can't help but advocate for performance building. "The proof is in the results," he says. "The whole notion of creating a home like this is that you can reap the benefits of no energy costs, low maintenance and extremely comfortable conditions without giving up window space, airy rooms and nice design."

In October 2019, the home was recognized with a DOE Housing Innovation Award as a Grand Winner in the small custom home category. And, it's the Grand Winner in this year's Green Builder Home of the Year competition.

Smart monitoring. Devices and systems such as *Nexia*, *kumo cloud®*, *RedLINK*, and *Sense Home Monitor* keep tabs on already energy-conscious amenities, including lights, kitchen appliances and water fixtures.

COURTESY OF METUS

Key Components

APPLIANCES: Samsung ENERGY STAR® appliances

AUTOMOTIVE (ELECTRIC CAR CHARGING, ETC.): Mitsubishi Electric *INVERTER* Charging Station

BUILDING ENVELOPE: R-21 GreenFiber cellulose insulation, Huber R-3 ZIP sheathing, ZIP tape, MTI 3/8-inch rigid rainscreen, Allura Fiber Cement cladding

CABINETS, SHELVES, MILLWORK: Wellborn Cabinets

CAULKS AND SEALANTS: Huber floor adhesive, PPG *TOP GUN®*

COUNTERTOPS: Elements Quartz

EXTERIOR FINISHES: Allura Fiber Cement siding and cornice

FIREPLACE: Heatilator element 42-inch EL42

FLOORING: Stained concrete

GARAGE DOORS: LiftMaster

HOME CONTROLS: *kumo cloud®* from Mitsubishi Electric

HVAC/DUCTS: Mitsubishi Electric ductless and ducted minisplits with 3D *i-see Sensor™* technology

INSULATION: *ZIP System®* R-sheathing

LIGHTING: Progressive Lighting - Fixtures: Colton, Keeley

PAINTS AND STAINS: Sherwin Williams, Porter Paint

PLUMBING/PLUMBING FIXTURES: Delta faucets and fixtures; PEX pipe material for water distribution. All fixtures were low-flow with WaterSense labels

RENEWABLE ENERGY SYSTEMS (SOLAR, WIND, ETC.): Mitsubishi Electric photovoltaic panels connected to a SolarEdge *StorEdge* inverter, for a total rated output of 8.2 kW

ROOF: Blown in R-50 cellulose insulation; Huber *ZIP* sheathing as roof decking, *ZIP* tape and flashing, and 26-gauge standing seam metal roof

SPECIALTY PRODUCTS: Ultra Aire *MD33 In-Wall Dehumidifier*

VENTILATION: Broan ERV

WINDOWS, SKYLIGHTS, PATIO DOORS: Interstate Window and Door

OTHER:

- Exhaust fans by Panasonic
- *Nexia Home Automation* connecting Samsung appliances and water monitoring/shutoff system
- *kumo cloud®* (by Mitsubishi Electric) – remote monitoring, programming and control of bedroom HVAC systems.
- Honeywell *RedLINK Internet Gateway* and thermostat – remote monitoring, programming and control of living space HVAC system.
- *Sense Home Energy Monitor* – remote monitoring of all electrical usage by device, and solar production
- Ring – security and remote visual monitoring of premises
- SolarEdge – remote monitoring and control of PV system

CREDIT: J.JAMES LEADBITTER

Resilient Retreat

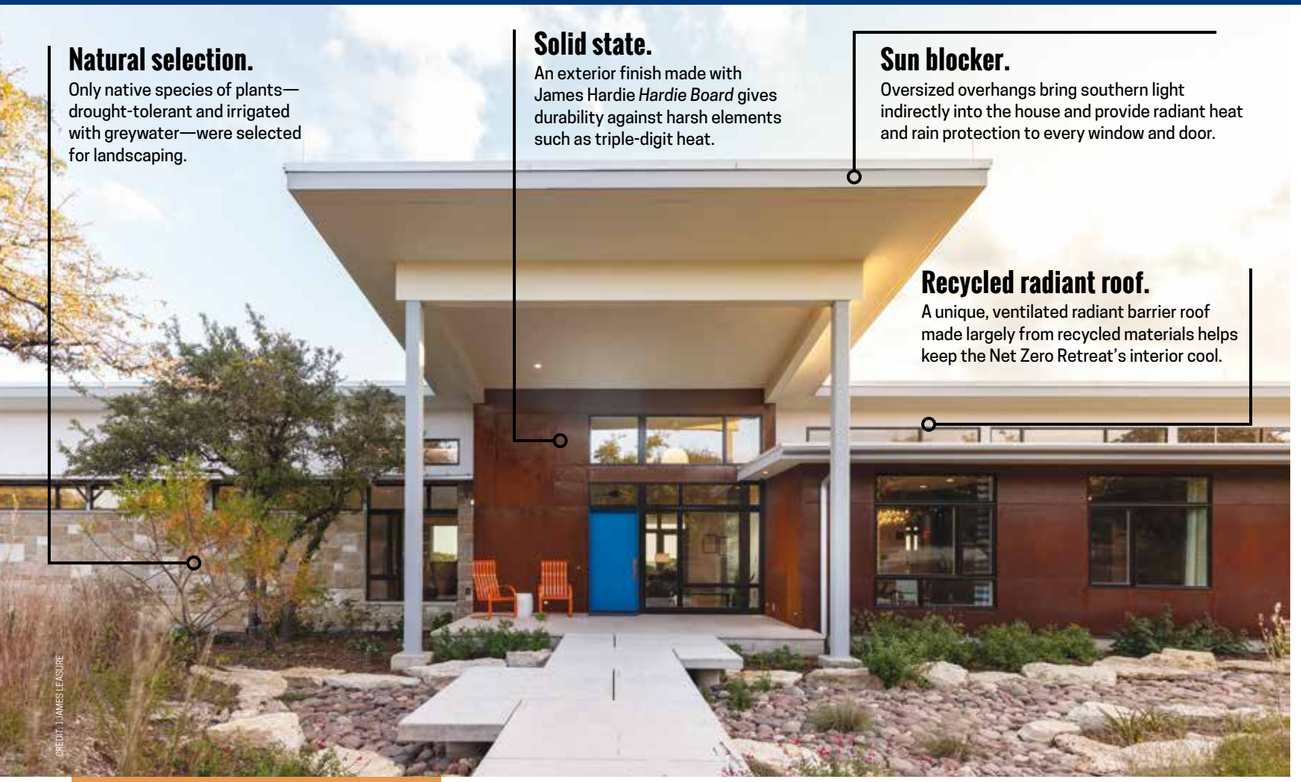
Prepared for the uncertainties of Climate Change, this home can weather almost any storm.

BY GREEN BUILDER STAFF

AS THE SUMMERS get hotter and the storms get bigger, it is not that far a stretch to think that at some point, many people will lose power for longer than a day or two. When that happens, will their current "green" home still work?

That's the question developers of the Net Zero Retreat in Austin, Texas, wanted to answer. Instead of relying on energy-efficient equipment and "green" technologies, the Net Zero Retreat was designed using climate-responsive, site-specific principles that help keep the home comfortable without relying solely on air conditioning. The orientation, organization and layout work as an ensemble to provide the home with soft, balanced daylighting, passive heating and cooling, and very good indoor air quality. Meanwhile, the low-maintenance exterior and drought-tolerant native landscaping provide resiliency by design—all while conforming to the "modern" aesthetic.

"While the design went through multiple iterations, the final version met all of our criteria, and then some," notes Peter Pfeiffer, principal of Barley|Pfeiffer Architecture. "Without the direct intention, we created what will become a net zero home!"



FROM THE JUDGES

"This is a gorgeous home of sophisticated contemporary design–quite possible the best architecture of any other applicant."

IN A NATURAL STATE

According to Pfeiffer, the homeowners were looking for the nexus of environmental stewardship, "high performance" comfort, and healthy living. That meant complete reliance on rainwater collection for indoor water use, a harmonious response to the site's micro-climate, the need for excellent indoor air quality (IAQ), enhanced natural ventilation strategies and a bug-free outdoor "living room" that comfortably connects one to the outdoors—while maintaining the indoor/outdoor spatial relationship.

The No. 1 goal by the architect, as well as builder Paul Oliver of Oliver Custom Homes and landscape architect Steve Domigan of SKDLA Landscape Architecture, was to create a tasteful addition to the area that worked in harmony with the existing, on-site ecosystem.

After reviewing their programming desires and visiting the area, a building site was chosen that maximized the ability to meet these goals, as well as ensure a wonderful view from each living space and the ability to preserve as much land as possible in its natural state.

Only areas that were to receive impervious cover such as the home, driveways, patios and cistern were cleared, and existing swales were preserved or enhanced for directing water around the home. New additions to the landscape included a dry creek created in front of the house. The rest of the site was protected and left as is.

GOING GREY(WATER)

Because water is somewhat of a commodity in Texas Hill Country, care was taken to select only native species of plants for landscaping. These drought-tolerant plants are watered only as needed, and almost entirely by greywater.

Rainwater is collected for 100 percent of indoor water use, including for pool and spa. A first-flush diverter and fine particle filter clean the water before it reaches a 60,000-gallon cistern capable of supplying a five-person household for almost six months. A UV light filter finalizes water purity.

Greywater is also diverted away from the septic field, and used to do most of the irrigation on site. There is also a backup well for outside water use, but with all of the plants being native and drought tolerant, the well's use is kept to a minimum.

BUILT TO LAST

Durability, embodied energy and occupant health were first priorities when selecting materials for this project. Many of the exterior materials were deemed acceptable based on their environmental product declarations, while the health product declarations were extensively reviewed for the interior materials so as to limit chemical and VOC off-gassing within the home. Materials were selected, in part, based on their recycled content as well as regional availability.

For example, the home's metal roofing contains steel coil stock from a regional source that has a high recycled content and is manufactured locally. It also has a Class 4 UL 2218 Impact Test storm rating, meaning far less panel replacement in the future, and therefore less potential waste.

Workers were also required to split the types of waste into separate bins for reuse or recycling, ultimately diverting more than 25 percent of project waste from the landfill.

Light-colored surface materials were chosen for the interior of the house to enhance the daylighting in every space, making them bright and welcoming without artificial lighting. Specifically placed operable windows provided advanced passive cooling strategies. Meanwhile, separating the garage from the main house and providing adequate ventilation for the carport, along with carefully sized mechanical equipment that positively pressurizes the home and MERV 10 air filtering, establish excellent IAQ.

"We also found that a combination of by-hand sun angle analysis and energy modeling allows us to be proactive in our design when it comes to the climate-specific features of the home," the firm Barley|Pfeiffer notes. "Since we use it not just to predict the overall energy usage but also as a design tool, our design adjusts as we identify places for potential savings."

SPEAKING OF SAVINGS...

Instead of relying on efficient mechanical systems and furnaces, builders took advantage of the site's available natural resources. The home's orientation and layout are driven by solar angles and predominant winds, resulting in shaping the building to have long faces on the north and south, and short faces on the east and west. The home has high windows on the northern side to take advantage of reflected northern light and is an integral part of the passive cooling system. The main living spaces and outdoor living areas are placed towards the southeast, taking advantage of the passive cooling winds they capture.

Oversized overhangs and awnings help balance out the natural southern light and allow it to be brought into the house indirectly, as well as provide radiant heat and rain protection for every window and door. Spray foam in the exterior walls and along the underside of the roof, along with continuous insulation on the exterior walls and a unique ventilated radiant barrier roof system—a "shading umbrella"—also provide protection from radiant heat.

By capturing prevailing breezes, energy consumption is reduced to where without mechanical air conditioning, the house can remain comfortable—under 80 degrees F—during a day where the peak outdoor temperature is 102 degrees F. Once a photovoltaic array and home battery are installed, the project will fulfill its design intent of being completely off grid, Pfeiffer notes.

The result? After analyzing a full year of bills, it's been determined that the home is consuming around 2,000 kWh per month. While that doesn't sound that energy efficient, Pfeiffer notes that when you take into account the amenity items such as the pool and spa, as well as the rainwater system, the house itself is actually using closer to 1,250 kWh per month. Considering its size, and that a family of five lives in the house full time, that's less than half of what a similar-sized home with one less person living in it typically uses.

"[Overall] the house is performing around 66 percent better than our energy modeling predicted it would," the company notes. "Simply put, by design, this home requires less energy to be comfortable year round."

Project Stats

NAME: Net Zero Retreat, Austin, Texas
ARCHITECT/DESIGNER: Alan Barley and Peter Pfeiffer, Barley|Pfeiffer Architecture
BUILDER: Paul Oliver, Oliver Custom Homes
LANDSCAPE ARCHITECT: Steve Domigan, SKDLA Landscape Architecture
INTERIOR DESIGNER: Sharon Radkovich, Panache Interiors
PHOTOGRAPHER: James Leasure

Bright idea. A lightly colored interior and strategically placed windows keep rooms bright and welcoming without use of artificial lighting.
CREDIT: JAMES LEASURE

Key Components

ALTERNATIVE BUILDING SYSTEMS: Passive Solar Design, *Rainwater Collection*, Solar panels
APPLIANCES: Expressions Home Gallery
BUILDING ENVELOPE: James Hardie *Hardie Board* via Eastside Lumber and McCoy's
CABINETS, SHELVES, MILLWORK: Russell O'Connor Construction, Inc. and Austin Wood Works
CENTRAL VAC: AIR-RITE by Design
COUNTERTOPS: Hill Country Granite, LLC
DECKS: San Gabriel Ornamental
DOORS AND HARDWARE: TriSupply and Builders Display
ELECTRICAL: RPE Enterprises, LLC
EXTERIOR FINISHES: James Hardie *Hardie Board* via Eastside Lumber and McCoy's
FLOORING: Mike's Hardwood Floor
HVAC/DUCTS: AIR-RITE by Design
INSULATION: Best Insulation
LANDSCAPING: SKDLA Landscape Architecture
LIGHTING: Lights Fantastic
PAINTS AND STAINS: Gamez Painting
PLUMBING/PLUMBING FIXTURES: Dahl Plumbing, Morrison Supply, Moore Supply
ROOF: Precision Roofing
STRUCTURAL COMPONENTS: Conrad Engineering
WINDOW COVERINGS: Panache Interiors
WINDOWS, SKYLIGHTS, PATIO DOORS: Mirror Gallery

CREDIT: TED L. CLINTON

Net Zero Times Three

The Anacortes Triple Zero Home covers all the bases when it comes to energy efficiency.

BY GREEN BUILDER STAFF

WHEN TED L. CLIFTON was asked to design a net zero home for clients in very Northwestern Wash., he already knew the goals he had to meet. This wasn't his first such dwelling; it wasn't even his first in the tight-knit city of Anacortes, population 18,000-plus.

After all, being net zero really means being exceptionally efficient with a home's components. In this case, the goal was triple zero, as in zero energy, zero water and zero carbon emissions. Again, not impossible if done right, he notes.

But this dynamic living quarters—dubbed "The Anacortes Triple Zero Home"—gave Clifton, founder and chief designer at Zero-Energy Home Plans, LLC, and his builder partner, David Wallace of CVH Inc./Clifton View Homes, a few things to think about. There wasn't much property to work with, and owners wanted a premium view of Lake Erie, one of Skagit County's lowland lakes.

"We needed to fit on a very tiny, narrow lot, while staying at least 100 feet back from Lake Erie, and not taking up the same space as the already-in-place on-site septic system," Clifton notes. '[Ultimately] we were able to fit a three-bedroom, three-bath luxury home into less than 1,900 square feet of conditioned living space, while minimizing exterior surface area with [a] rounded shape."

FROM THE JUDGES

"This home had to be shoehorned into a narrow site with constraining setbacks. The round form of the floor plan minimizes exterior walls and takes advantage of solar exposure for PV and passive gain in the winter while providing shade in the summer."

GREEN DESIGN IS IN THE DETAILS

The key starting point in the Triple Zero Home's construction came with the use of structured insulated panels (SIPs) and their composition: a structural insulating foam core sandwiched between two structural facings—typically a composite board such as oriented strand board (OSB).

Clifton View Homes notes that SIPs are manufactured under factory controlled conditions and can be fabricated to fit nearly any building design. The result is a building system that is extremely strong, energy efficient and cost effective. Building with SIPs can actually save time and money because the components come ready to install and don't require extra labor for each component, the company states. The large panel sizes also contribute to a very tight building envelope.

"The use of SIPs allowed us to go places with the design that would not have been possible using conventional framing methods," Clifton says.

NATURAL LIGHTING AND MORE

Solar power became another key component is the home's construction. Triple-pane high solar heat gain windows, combined with the Triple Zero Home's long south-facing overhangs, allows owners to collect lots of passive solar heat during the winter, while minimizing solar gains during the summer.

There were also internal atmospheric conditions to meet. With a blower-door test just over 1.0 ACH50, developers provided fresh air through a MERV 21-powered HEPA filter, which also serves to balance the range fan. A Panasonic *WhisperGreen* bath fan provides the ANSI/ASHRAE Standard 62.2 make-up air requirement, using a High-efficiency particulate air (HEPA) filter as its conduit for fresh air to enter the home. And the COP 3.92 Chiltrix *Air-to-Water CX34* heat pump reheats the incoming air more efficiently than it could be recovered using any currently available heat recovery ventilator (HRV), Clifton notes.

"The home was [also] built without any material containing volatile organic compounds (VOCs) inside the building envelope, possibly making this house a 'Quadruple-Zero' house, if anyone is counting," he notes.

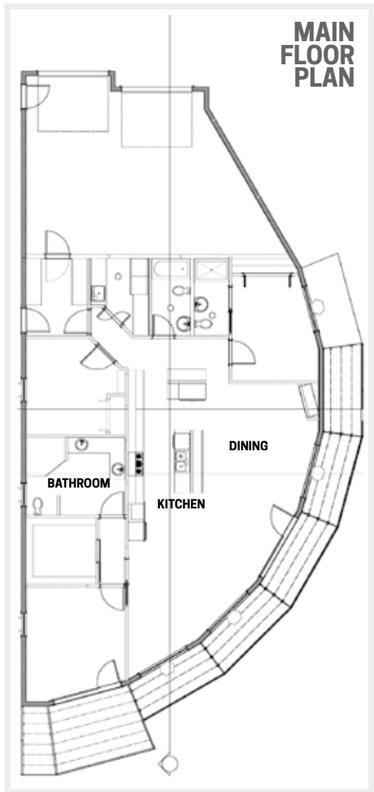
SECONDARY LIVING IMPROVEMENTS

Clifton and Wallace also tackled two key green areas that are outside the main living area.

In the basement, there is 20,000 gallons of fresh water storage, along with a rainwater treatment system.The basement also houses the buffer tanks and pumps for the hydronic air-to-water heating system, providing heat and hot water to the home at an efficiency of 392 percent.

And in the garage, two 240V, 40Acharge ports provide enough energy with only the first two-thirds of the photovoltaic system installed to power an electric car for about 6,000 miles per year.With the other one-third of the solar array installed, the home would power itself and two electric cars for more than 30,000 miles per year.It's a key point for anyone who wants a truly sustainable home, Clifton stresses. "In our opinion, you are not zero until your house *and* your car are zero," he says.

Overall, Anacortes Triple Zero Home showcases Zero Energy Home Plan's philosophy. "We get a kick from hearing customers stories about no energy costs," the company notes. "We hear how some homes have excess solar production and are 'fueling' their electric cars; they tell us how they love the floorplan, and the way the house 'lives.' This helps affirm that we are providing real value in our home designs."



Project Stats

NAME: Anacortes Triple Zero Home, Anacortes, Wash.
ARCHITECT/DESIGNER: Ted L. Clifton, Zero-Energy Home Plans, LLC
BUILDER: David Wallace, CVH, Inc. dba Clifton View Homes
PHOTOGRAPHER: Ted L. Clifton

Key Components

ALTERNATIVE BUILDING SYSTEMS: Graphite-infused structured insulated panel (SIP) construction for walls and roof

APPLIANCES: Bosch ovens, Samsung induction range, Bosch dishwasher, Sub-Zero refrigerator, Bosch laundry pair

AUTOMOTIVE: Two 40A electric car charging stations in garage

BUILDING ENVELOPE: James Hardie *Hardiplank* siding over Kimberly Clark *BLOCK-IT House Wrap;* 6 1/2-inch graphite-infused SIP walls; half-inch Gypsum Wall Board (GWB) interior; R-28 wall assembly; 10 1/4-inch graphite-infused SIPs roof; Grace *Ice & Watershield* underlayment; standing-seam roofing from Taylor Metal; 5/8-inch Type X GWB interior; R-46 assembly

CABINETS, SHELVES, MILLWORK: Custom cabinets from Woodhouse of Anacortes

CAULKS AND SEALANTS: SIP sealants from Premier Building Systems, Puyallup, Wash.; zero volatile organic compound (VOC) siding and interior sealants from GE.

CENTRAL VAC: Rough-in only.

COUNTERTOPS: Granite

DECKS: Sustainably harvested eucalyptus wood decking

DOORS AND HARDWARE: Vinyltek exterior *EuroTwist* glass doors; Codel *C6P* and *SF61* other exterior doors with Schlage hardware; Masonite interior doors with Schlage hardware

ELECTRICAL: 100 percent LED lighting; wireless repeaters in every room for optimal performance

EXTERIOR FINISHES: Sherwin-Williams zero-VOC exterior and interior paints

FIRE PROTECTION: Uponor fire sprinkler system

FLOORING: Finished concrete, surface ground finish.

GARAGE DOORS: Clopay R-18 panel doors

HOME CONTROLS: Integral to HVAC system

HVAC/DUCTS: In-floor radiant system, Chiltrix *CX34* air-to-water heat pump

INSULATION: R-38 closed-cell spray foam insulation under floor; the rest is SIP except for air-sealing of rim-joists and other minor areas also using closed-cell spray foam

LANDSCAPING: By owner, native trees or semi-dwarf fruit trees closer to house

LIGHTING: 100 percent LED, various manufacturers

PAINTS AND STAINS: Sherwin-Williams zero-VOC products (no stains)

PLUMBING/PLUMBING FIXTURES: Nebia shower valves and heads, Kohler wall-mounted toilets, Kohler sinks, Moen faucets

RENEWABLE ENERGY SYSTEMS (SOLAR, WIND, ETC.): 9.450 kW solar array, with room for another 4,725 watts for future car charging

ROOF: Taylor Metals standing seam steel

STRUCTURAL COMPONENTS: Boise Cascade *BCI* joists, *Glulam* beams

TELECOMMUNICATIONS: By owner, custom computerized system

VENTILATION: Fantech *CM200* HEPA filter, coupled to Fantech *RVF6* range fan for balance; Panasonic *WhisperGreen* bath fan; HEPA filter; Chiltrix *CX34*

WATER FILTRATION: Part of rain-water catchment system designed by RainBank of Seattle

WATER HEATING: Chiltrix *CX34*

WATER MANAGEMENT (INDOOR/OUTDOOR): Overflow water used for outside irrigation, with a 3,000-gallon tank for storage; indoor water is managed by low-flow faucets and short plumbing runs; hot water circulation system on timer to limit wasting of water while waiting for hot

WINDOWS, SKYLIGHTS, PATIO DOORS: Vinyltek triple-glazed Triple-Low-E glass, U-value average 0.16, high SHGC for optimum passive solar heating of concrete floor; large overhangs to limit excess summer solar gain and help with rain water collection.

Horizon House

This tiny house is designed to stay safe, even in the face of nature's fury.

BY GREEN BUILDER STAFF

THERE'S NOTHING QUITE LIKE a small house on a big setting. But "The House of the Horizon" in Puerto Rico meets that challenge just fine.

Horizon is a 480-square-foot tiny eco house on a mountaintop a mere 400 feet above sea level in Lajas, one of the driest but better dark sky municipalities still remaining in the Southwest coast of Puerto Rico.

The home is an indirect result of the damage caused by Hurricane Maria, which devastated the region in 2017, killing more than 3,000 people and leaving tens of thousands homeless. The Category 5 hurricane is the worst natural disaster in the area in recorded history, according to the United States National Hurricane Center.

During that storm, another project by architect firm Abruña & Musgrave, Casa Ausente—the "Silent House"—proved super resilient and lost a mere four solar panels (out of 25). The home was otherwise functional, but project architect Fernando Abruña had "survivor's guilt" because so many other people were suffering.

That led to construction of Casa Rescate—the "Rescue House"—a 650-square-foot, zero energy home for anyone who was off the grid due to distance or disaster. Abruña made the architectural plans free to the public.

CREDIT: LUIS ROCA-IGLINA

CREDIT: LUIS ROCA-IGUINA

FROM THE JUDGES

"A very efficient design, and concrete is site- and climate-appropriate–albeit with high embedded energy."

A CARIBBEAN JEWEL

Which brings him to House of the Horizon, a very simple 12-foot by 40-foot volume built with core insulated concrete panels to minimize solar heat gains. It is water- and energy-independent by means of a well and a photovoltaic system with batteries. Gray water is used at the site for plant irrigation. Composting toilets convert excrement into fertilizer.

A basic floor plan highlights the central location of the kitchen/bathroom volume to organize the interior space with a sleeping area on one end, and a living room—with a sofa bed for occasional visitors—on the other. The kitchen incorporates two corner closets for a compact clothes washer on one, and a microwave oven and compact refrigerator in the other. The concrete countertop is fitted with a two-burner gas stove.

An outdoor barbecue/roaster north of the site next to the photovoltaic battery room and water cistern, completes the site composition.

LUNAR LANDING

Horizon is blessed with a magnificent view of the Caribbean Sea on the South and beautiful mountains on the North. The South-East main façade opens completely to a roofed area facing the beautiful seascape, making the house one big longitudinal porch with spectacular views. Coastal breezes allow for thermal comfort most of the year. A 5kBtuh air conditioner (SEER 28) uses only 25 percent of its capacity thanks to an energy-saving curtain system that isolates the bed area from the rest of the space, Abruña notes.


CREDIT: LUIS ROCA-IGUINA

Fortress-like backup. A compact photovoltaic system with batteries is still large enough to supply all of the home's energy needs in case it ever goes off the area's power grid.

Project Stats

NAME: House of the Horizon, Lajas, Puerto Rico

ARCHITECT/DESIGNER: Abruña & Musgrave, Architects

BUILDER: Peter Torres Rios, Professional Home Builders

PHOTOGRAPHER: Luis Roca-Iguina

A lunar terrace with site-sourced cyclopean stones and a small personal pond for four is the protagonist of the design scheme, he adds. It is located on the Southwest part of the site providing the setting for a "Moon Lamp" consisting of a white stones mandala that reflects moonlight, and a concentric circle of luminous stones that releases collected sunlight at night. The white stones turn "on" with an ethereal luminosity on full moon nights and the luminous stones on New Moon nights.

All in all, there's nothing be unhappy about, Abruña notes. "All is tranquil," he says. "The sun is warm, the breeze is cool and the moon proudly shines at night."


CREDIT: LUIS ROCA-IGUINA

A fresh outlook. Coastal breezes from the Caribbean Sea keep the Horizon's thermal comfort constant throughout the year.

Key Components

ALTERNATIVE BUILDING SYSTEMS: M2 core insulated structural concrete panels by Carmelo, PR

APPLIANCES: Della compact washing machine; 3.3 CF refrigerator and 0.07 CF microwave oven by Magic Chef; stainless steel kitchen sink by Elkay; kitchen faucet by American Standard

BUILDING ENVELOPE: M2 core insulated structural concrete panels

CABINETS, SHELVES, MILLWORK: Custom made with no lead content, 1/2-inch PVC panels from Home Depot

CAULKS AND SEALANTS: DAP *Alex Plus*

COUNTERTOPS: Exposed Cemex concrete

CONCRETE DECKS: Broom finish Cemex concrete

DOORS AND HARDWARE: Valco, PR hardware by Best Locks

ELECTRICAL: Roger Electric and Home Depot

EXTERIOR FINISHES: Paint by BEHR

FIREPLACE: Barbecue with firebrick by Bloques Carmelo, PR

FLOORING: Exposed Cemex polished concrete

FURNITURE: Capri Furniture, PR

HVAC/DUCTS: Frigidaire 5 Kbtuh window unit with remote control

INSULATION: 4-foot R-15, EPS (inside M2 panels by Bloque Carmelo, PR)

LANDSCAPING: Site sourced

LIGHTING: Exterior LED down lights by Progress Lighting; LED ceiling fan by Hampton Bay; ceiling lights by EGLO

PAINTS AND STAINS: Paint by BEHR

PLUMBING/PLUMBING FIXTURES: Lavatory and kitchen sink by Elkay, Biolet NE; composting toilet at main bathroom; and EZ-Loo air composting toilet at visitor's bathroom

RENEWABLE ENERGY SYSTEMS (SOLAR, WIND, ETC.): 2 kW photovoltaic system w Li-Ion battery by Maximo Solar, PR

ROOF: Cool Roof – BULL-BOND liquid membrane

SPECIALTY PRODUCTS: Bed perimeter curtain by Bright Inc.

STRUCTURAL COMPONENTS: M2 core-insulated structural concrete panels

VENTILATION: Natural ventilation

WATER FILTRATION: 36 GPD-6 stage home reverse osmosis system with solar pump by AMI *AA Series* system

WATER HEATING: Heliatos solar modular solar water heater

WINDOWS, SKYLIGHTS, PATIO DOORS: Flat slat aluminum doors; *Operable Aluminum Jalousie Window* and *BrightShade* aluminum window by Valcor, PR

CREDIT: DAVID SOLNICK

One for All

It's the same shade of green living, no matter where you reside in this upscale, multi-lifestyle complex.

BY GREEN BUILDER STAFF

IF ONE GREEN HOME is good, multiple green structures must be great. That's the crux of the housing at 430 Forest Avenue—a.k.a. "The Palo Alto Apartments"—a series of net zero residences in the heart of downtown Palo Alto, Calif.

All 13 dwellings—a penthouse, two townhouses and 10 apartments—were designed to provide a positive impact on residence health while promoting renewable, clean energy, according to project developers.

The 430 Forest Avenue project was designed and constructed by Shell Building Systems, architect David Solnick and developer Prabhas Kejriwal of Sageleaf Forest, LLC.

The client, meanwhile, wanted zero-energy and sustainable design elements to gain LEED Platinum certification (which it ultimately did). This commitment is also exampled by the project team employing CA Green Building Code Tier 2 Compliance, according to Palo Alto Apartments builders.

"Environmental and energy modeling was critical given the building's design with massive floor to ceiling windows in many units," notes James Hodgson, general manager of Premier Building Systems, the provider of structural insulated panels (SIPs) used in the project.

The end result was a very green series of apartments, indoors and out.

CREDIT: DAVID SOLNICK


CREDIT: DAVID SOLNICK

Room with a view. Dining areas are naturally lit as much as possible, courtesy of numerous extra large, high-efficiency glazed windows and a brightly colored interior.

FROM THE JUDGES

"This gorgeous project shows that efficiency can be beautiful. The high design of this project didn't get in the way of lofty LEED Platinum goals."

GREEN ON THE INSIDE

Multi-story building and extreme sustainability throughout every component required extensive planning and systems design. In addition, programmable smart home and a wide array of sustainable elements are central to the project's luxurious living, comfort and day-to-day conservation.

The Palo Alto Apartments' green status starts with its six-inch SIPs, which Shell Building Systems President Greg Koepf says are "the foundation for the project's efficiency and structural integrity."

From there, there is a micro-zoning high efficiency HVAC system with heat pump, all-LED high-efficiency lighting when needed—the natural day variety is emphasized as much as possible—high-efficiency glazed windows, and video monitoring in common areas throughout the all-electric home.

GREENER ON THE OUTSIDE

Meanwhile, the structure's Modern California exterior character, and transitions of scale and materials are compatible with the area's diverse design and historical nature.

A subterranean garage enabled design of a low-profile building mass that mitigates loss of natural light on adjacent neighbors' properties. It also frees up space to create building undulation for architectural interest and give room for design that embraces ample natural light, developers note. Also, each unit has its own Level 2 electric vehicle (EV) charger if—and when—it is needed.

A long-lasting PVC white reflective roof includes a photovoltaic system that produces 100 percent of the structure's projected energy use.

Permeable Calstone pavers allow movement of storm water through the surface, reducing runoff and filtering contaminants before it enters groundwater.

And, greywater plays a large role in the building's green status. Recycled content is used for landscaping; toilets will soon be plumbed for its use during flushes.

Project Stats

NAME: Palo Alto Apartments, Palo Alto, Calif.
BUILDER: Greg Koepf, Shell Building Systems
ARCHITECT/DESIGNER: David Solnick, Architect
DEVELOPER: Prabhas Kejriwal, Sageleaf Forest, LLC
PHOTOGRAPHER: David Solnick, Architect

Neighborly appeal. Developers designed the Palo Alto Apartments to minimize loss of natural light on neighbors' properties while enhancing their own.
CREDIT: DAVID SOLNICK

Key Components

APPLIANCES: Heat pump water heaters and clothes dryers
BUILDING ENVELOPE: Shell Building Systems
ELECTRICAL: All-electric appliances; a Level 2 electric vehicle (EV) charger for every unit to fully power electric cars
EXTERIOR FINISHES: Wood grain, high-definition, digital inkjet-printed recycled aluminum siding; *Stuc-O-Flex* elastomeric acrylic finish
HOME CONTROLS: Samsung *SmartThings* controller; occupant-controlled lighting in all common areas and inside units
HVAC/DUCTS: Micro-zoning, high-efficiency HVAC system with heat pump (locked out when windows open)
INSULATION: Structural insulated panels (SIPs) by Premier Building Systems
LANDSCAPING: Recycled greywater used for landscaping
LIGHTING: All-LED high-efficiency lighting; occupant-controlled lighting in all common areas and inside units
PAVERS: Permeable Calstone pavers
PLUMBING/PLUMBING FIXTURES: Plumbed for toilet flushing using greywater (addition in the future)
RENEWABLE ENERGY SYSTEMS (SOLAR, WIND, ETC.): Photovoltaic system produces 100 percent of projected energy
ROOF: Long-lasting PVC, white reflective roof
TELECOMMUNICATIONS: Video monitoring in common areas
WATER FILTRATION: Permeable Calstone pavers allow movement of stormwater through the surface
WATER HEATING: Heat pump water heaters and clothes dryers
WINDOWS, SKYLIGHTS, PATIO DOORS: High-efficiency glazed windows
OTHER:
- Stuc-O-Flex *Water Way Rainscreen Drainage Mats* to facilitate drainage/air flow induction cooking
- Cellular PVC trim (recyclable)

Multifamily Masterpiece

It's elegant, it's efficient, and it's a sign of things to come, according to these Seattle developers.

BY GREEN BUILDER STAFF

SITKA SURPASSES EXPECTATIONS about the possibilities afforded by sustainable design. The seven-story, 384-unit building in Seattle uses innovative technology and design techniques to achieve a level of energy efficiency previously not seen at this scale, making it one of the most-sustainable multifamily buildings in the region.

The building's design evokes the ethos of Northwest modernism and the landscapes of the surrounding area. Three cabin-like buildings are slightly angled to create a concave backdrop to the adjacent park, while the south wing's sloped green roof reflects regional forms and allows light into the courtyard.

The design team—which included architect Brian Runberg, founder of Runberg Architecture Group, builder Sean Stimac of Exxel Pacific, and landscape architect Jason Henry of Berger Partnership PS—wanted to create a property with a strong sense of place. "We wanted to infuse Sitka with regional identity," Runberg says. "We didn't want it to look identical to all the other midrise multifamily buildings that are springing up across the city."

HOME OF THE YEAR AWARDS
GREEN BUILDER
2020
Sustainable Community

CREDIT: © CHRISTOPHE SERVRANX

CREDIT: © MICHAEL WALMSLEY

FROM THE JUDGES

"Ultimately economic success and great design will make this project a strong example for others to follow."

POWERING UP

Sitka's energy design began by analyzing the energy needs in multifamily buildings and then applying a series of efficiency measures.

As the largest source of energy use in new multifamily buildings, hot water was the design team's No. 1 focus. The *Wastewater Heat Recovery System*, the first in the U.S. for this application, captures heat from outgoing wastewater and reuses it for domestic hot water heating. This process effectively recycles heat in the hot water system by using water-to-water heat pumps to capture and move heat from outgoing wastewater to the next day's hot water supply, according to Runberg. Also, the project also utilizes a greywater harvesting system that diverts water from showers and laundry for on-site irrigation.

Heating and cooling are relatively low demands for compact apartments in Seattle that are built to the new energy code. But the design team looked for ways to improve energy performance and reduce energy consumption even further.

Sitka's system offsets any energy needs during the winter and summer. All of the building's west- and south-facing units—and roughly one third of the project's remaining units—feature ductless heating pumps, which provide cooling in the summer and reduce heating needs in the winter by a factor of three. The reduction in heating energy use more than makes up for the increase in cooling energy use in the summer. Ductless heat pumps and heat recovery ventilation systems are also present in Sitka's amenity spaces.

By breaking up the building massing at the west and south points, direct sunlight is able to filter into the courtyard at midday and afternoon. The sloped green roof on the south building allows more sunlight into the courtyard-facing units, reducing the need for artificial lighting during the day.

For the interior, the corridors were designed with large windows at each end to allow natural light and ventilation into the hallways. The project's exterior elevator reduces the amount of energy lost via air leakage from the repeated opening and closing of the doors. Additionally, the lobby staircase was designed to be visible from the main elevator to encourage residents to travel by foot instead.


Easy flow. ENERGY STAR®-rated appliances, LED lighting and a corridor-styled ayout enhance air circulation with minimal mechanical intervention.
CREDIT: © CHRISTOPHE SERVIERES

Project Stats

NAME: Sitka, Seattle, Wash.
ARCHITECT/DESIGNER: Brian Runberg, Runberg Architecture Group
BUILDER: Sean Stimac, Exxel Pacific
DEVELOPER: Alicia Stedman, Vulcan Real Estate
LANDSCAPE ARCHITECT: Jason Henry, Berger Partnership PS
INTERIOR DESIGNER: Christiane Pein, Lair Design, LLC
PHOTOGRAPHER: ©Christophe Servieres; ©Michael Walmsley

MORE KEY COMPONENTS

Additional energy-efficient elements include LED lighting throughout, ENERGY STAR® appliances and a high-efficiency 14-foot-diameter fan in the fitness center. Sustainable features include a green roof with drought-tolerant plants; bioretention planters to capture roof runoff, and provide detention and some filtration prior to discharge to the city storm sewer; use of recycled and locally sourced materials; and low-flow toilets and fixtures.

Vulcan Real Estate also provided street front access to the city of Seattle for its "Swale on Yale," a large, man-made wetland designed to treat the majority of street runoff from the Capitol Hill neighborhood before it is discharged into Lake Union. The swale will significantly improve the water quality in the lake while providing an attractive amenity for pedestrians, the company notes.

These energy-efficient elements combined helped Sitka achieve LEED for Homes Platinum certification. Sitka is also on track to achieve ambitious local 2030 targets for reductions in water and energy use, as well as receive an Energy Star energy use intensity (EUI) score of 16—way below the multifamily housing average of 59. The property uses nearly 28 percent less energy than a typical baseline design. "These savings aren't just beneficial for the environment," Runberg Architecture Group notes. "They represent a considerable reduction in the property owner's overhead costs and in residents' monthly utility expenses."

Overall, Sitka's development was a success, according to Runberg. "People are drawn to Seattle not just for jobs, but for the lifestyle, the landscape and the chance to immerse themselves in nature," he notes. "Washington is a beautiful state, and we wanted to bring some of that Pacific Northwest magic to our design." GB

Key Components

ALTERNATIVE BUILDING SYSTEMS: *Wastewater Heat Pump System*, greywater irrigation system
APPLIANCES: Whirlpool
AUTOMOTIVE (ELECTRIC CAR CHARGING, ETC.): ClipperCreek
BUILDING ENVELOPE: DuPont *Tyvek® CommercialWrap*
CABINETS, SHELVES, MILLWORK: Lanz Cabinets
CAULKS AND SEALANTS: Dow
COUNTERTOPS: Basix Surfaces, Caesarstone
DECKS: Skyline Decking
DOORS AND HARDWARE: Steelcraft, Cox, Lynden
ELECTRICAL: Unity Electric
EXTERIOR FINISHES: James Hardie, Woodtone, AEP Span, Citadel, Trespa
FIRE PROTECTION: Wolfe Fire
FIREPLACE: Montigo
FLOORING: TAS, Pental, Armstrong, Daltile, Patcraft
FURNITURE: Specified by Lair Design, LLC
GARAGE DOORS: Rytec
HOME CONTROLS: Cadet programmable thermostat
HVAC/DUCTS: Panasonic, Mitsubishi
INSULATION: Knauf, Roxul, Dow
LANDSCAPING: Green Effects
LIGHTING: Lutron, Marset, Contech
PAINTS AND STAINS: Sherwin Williams, Cabot
PAVERS: Stepstone, Bison, Vancouver Bay
PLUMBING/PLUMBING FIXTURES: Moen, Elkay, Niagara
RENEWABLE ENERGY SYSTEMS (SOLAR, WIND, ETC.): *Wastewater Heat Pump System*
ROOF: American Hydrotech, Carlisle SynTec, Columbia Green Technologies
STRUCTURAL COMPONENTS: Weyerhaeuser *Trus Joist*
TELECOMMUNICATIONS: WaveNet
VENTILATION: Panasonic, Mitsubishi
WATER HEATING: Custom wastewater heat recovery system (WWHR)
WATER MANAGEMENT (INDOOR/OUTDOOR): Wahaso greywater irrigation system
WINDOW COVERINGS: Draper
WINDOWS, SKYLIGHTS, PATIO DOORS: VPI Quality Windows, NanaWall, Arcadia Storefront

A Global Green Makeover for Construction

Demand for green building is vast, but the industry needs structural change.

BY TERRY BEAUBOIS

AS GREEN BUILDING BECOMES even more important and popular in 2020, and as it continues to include additional aspects of "green" such as sustainability, Internet of Things, healthy, and safety, the designing and building of green buildings will become even more important locally, nationally and globally.

Driving the opportunities in green building are the overall economic indicators of the global construction industry. The PwC-sponsored report *Global Construction 2030* forecasts that the volume of construction globally will grow by 85 percent, to $15.5 trillion worldwide by 2030. Three countries, China, the U.S. and India, will lead the way with 57 percent of all global growth.

It is within that scenario that green building has the potential to experience its share of that projected growth in the next 10 years. It is also the situation in which building product manufacturers, financial institutions and technology companies will be responding to greater global opportunities within the green building market over the next decade.

National Association of Home Builders (NAHB) economists continue to provide insight into the various U.S. regional outlooks through **short- and long-term forecasts**. The association gives a presentation at the International Builders Show each year.

These reports and projections are helpful guides, but even economists joke about the search for a "one hand economist" because so many economic projections tell us one thing and then say, "on the other hand...." and go on to mention that the exact opposite could also happen. But these outlooks are good to consider in planning your own business strategies for 2020 and beyond.

GREEN BUILDINGS ARE 'SYSTEMS'

Many green building elements have been around for a long time, and new ones are constantly being developed. As the demand for buildings increases and new people enter the design and construction professions each year, the need to emphasize how these various components work together is an increasingly important factor. Understanding the system of green building is needed to continue to improve the overall efficiency and effectiveness of the building industry in general and specifically.

All buildings are complex systems. Green buildings are no exception. There is the challenging need to balance cost and budget issues, and time schedules. As the awareness of green building increases among clients, designers, architects, builders, subcontractors and consultants, the need for a systems-thinking approach will become necessary.

Air quality awareness. With indoor and outdoor air pollution becoming more of a problem, builders will need to continually study the latest techniques in improving household air quality.
CREDIT: KENTARO IEMOTO/FLICKR

To successfully design and build a green building requires knowledge of how all of the pieces work together. Aesthetics, architecture, structural, mechanical, electrical and lighting, plumbing, safety and fire protection, audiovisual equipment, appliances and equipment, health, and how to meet local codes and requirements are all part of the challenge of any building. They are certainly a significant factor in successful green building projects.

Endless demand? Green construction is expected to grow to $15.5 trillion worldwide by 2030.
CREDIT: JAY THOMPSON/FLICKR

Because we rely on a team of consultants and subcontractors to provide the specialized knowledge of each of the trades and each piece of equipment, the best situation would be if everyone, including our clients, knew as much as possible as to how their specialty, selections and decisions fit in with all of the others. But often, that is not the case. So, it falls on someone to know about how they all work together.

In many cases, that might be you. Because each project is a variation on the overall themes involved in green building and is also affected by our clients—and their interests and knowledge, the marketplace, and local geographic and climate conditions—the availability of products, materials and talent for the team you build for each of your projects can be a considerable challenge.

Even how we do our business and how we communicate within the building team continues to change and evolve as the internet, smartphones, software and online conferencing are more frequently used in attempts to make our projects more efficient and manageable. This will also continue to evolve in 2020 and beyond.

NEW PRODUCTS AND MATERIALS

Being able to rely on proven products and materials that we have used before, as well as methods and procedures of doing work that have worked in the past, is great. The challenge is doing so in an industry that continues to change.

As many trade shows and conferences demonstrate, there are more products and materials every year. In the area of custom home design, it's often clients who suggest these new products and materials for their projects. Remaining aware of product availability as manufacturers discontinue some older items and introduce newer ones can reduce projects delays.

SAFETY, ACCESS TO ENERGY AND INNOVATIONS IN THE BUILDING INDUSTRY

Wildfires, flooding and other weather-related events can change priorities in your area. Some of these devastating issues need to be addressed before the disasters occur, through design and construction. This is an important part of being a green builder.

The wildfires in Western states have resulted in the shutdown of utility company-provided power in many communities. This has increased the need for reliable sources of energy before, during and after any catastrophe. New solutions are being developed and will be introduced and further written about in 2020.

The offsite construction of trusses that can be shipped to the site and installed, have been around for decades. Additional building components are being developed, such as cross-laminated timber (CLT) and steel components created offsite in factories, to entirely

Dangerous times. Natural disasters such as wildfires will lead to additional advances in reliable power production, and related safe construction programs for builders.
CREDIT: GLENN BELTZ/FLICKR

steel-framed, furnished modules for hotel projects. There is also the use of 3D printing, but that's still in the developmental stage and we'll have to wait to hear more.

HEALTHY BUILDINGS AND DESIGN FOR HUMAN HEALTH

Aesthetics, safety and health are now among the top elements that homeowners and building owners desire and expect in their structures. Green builders can take a leading role in these areas in the coming years.

As the focus of healthcare, nationally and locally, expands to not just being about "sick-care" treatment but to also to include an increased focus on reducing health problems before they occur, the role of architects and builders as providers of healthy environments becomes even more clear.

Each year, more health issues are being connected to environmental or functional matters. As we increase our ability to provide healthy, green homes, we contribute to the overall health of the people living in our buildings. This is an important component of the healthcare system for any nation. Healthcare professionals and agencies in the U.S. and other countries agree that anything that can be done to reduce accidents in the home, and environmental causes of poor health, will help significantly.

Related to injuries is the issue of "Designing for All." Accommodating all ages, those with short-term and long-term disabilities in a family, or any limitation that visitors to a family may have, can also extend the value of the buildings we create by increasing the length of time that people can remain in their homes.

Throughout 2020 I will continue to cover examples of what to consider for your projects. From updates on what exterior building products meet the new fire regulations that are being developed and implemented, to new products that can provide power when the utility company shuts down their supply of energy, to other ideas and products for new homes, communities and non-residential buildings, for you to consider.

Throughout the year, *Green Builder* provides a great, broad overview of green building, as well as focused information, conferences and awards programs that recognize efforts of green builders. Continue to remain informed and increase your own knowledge for your own success in the green building industry in 2020 and beyond. **GB**

Terry Beaubois is the CEO of Building Knowledge Systems, LLC, in Palo Alto, Calif. He is involved in research projects, articles, speaking engagements, and guest lecturing on issues related to the building industry, with a specialty in advancing technologies and green building. He is also a consultant to the U.S. Department of Energy's Office of Building Technology, a consultant to NASA, and a guest lecturer at Stanford University. He can be reached at tbeaubois@gmail.com. A complete list of articles that Beaubois has written for Green Builder magazine, as well as a video of his presentation at the January 2019 Sustainability Conference in Orlando, is available at www.BKSco.com/GBarticles.

CODE ARENA

The Latest Rules, Regulations and Codes Impacting Sustainable Construction

Three Steps Forward, Two Steps Back

The new year will bring changes to laws impacting farmers, public housing—and light bulbs.

BY MIKE COLLIGNON

HERE ARE A FEW updates that are applicable to the entire United States:

UNITED STATES (PART 1) – The controversial "Waters of the United States" rule has been repealed. As of Dec. 23, 2019, the definition of "the waters of the United States" no longer aligns with the 2015 version. Instead, that phrase will revert back to its 1986 definition. There are four reasons for the repeal, all of which can be read in the Oct. 22, 2019 report in the Federal Register, "Waters of the United States —Recodification of Pre-Existing Rules." (https://bit.ly/34t9cC4).

This rule has been held up in the courts since its inception. The Trump Administration is looking to create its own definition that would favor developers and farmers, by allowing them to pave over wetlands that only exist during certain portions of the year. The Environmental Protection Agency (EPA) and the Army Corps of Engineers have been tasked with developing the new definition.

While it is true that waters of the United States are protected, the definition remains unsettled because neither Congress nor the Supreme Court have been able to clearly define it. It is expected that, like the 2015 rule, the soon-to-be devised rule will face immediate legal challenges.

UNITED STATES (PART 2) – In early September, the U.S. Department of Energy (DoE) announced the rollback of energy-efficient light bulb standards ("Trump Administration Reverses Standards for Energy-Efficient Light Bulbs," NPR, Sept. 4, 2019, https://n.pr/2ZotXUL) initiated by President Bush and finalized under President Obama. They were set to go into place in January 2020, and they aimed to gradually phase out incandescent and halogen bulbs in favor of LED lights. DoE claims the new lightbulb standards were established in 2017 "in a manner that is not consistent with the best reading of the statute". The rollback is likely to face legal challenges from many environmental groups, which vowed to sue if the bi-partisan standards were reversed. To read the 60-page DoE rollback justification, justification, visit https://bit.ly/2YTdamu.

UNITED STATES (PART 3) – On Sept. 10, 2019, the House passed HB 1690, also known as the CO ALERTS Act of 2019. It calls for each public housing agency to ensure that carbon monoxide alarms or detectors are installed in each dwelling unit in public housing owned or operated by the public housing agency. The implementation of this bill by the applicable agencies must meet or exceed the standards described in chapters 9 and 11 of the 2018 International Fire Code (IFC), or any other standards that the Secretary of Housing and Urban Development might adopt. The bill also requires detectors in rural rental properties that fall under the purview of the U.S. Department of Agriculture.

Should it pass the Senate, it goes into effect two years after that date. The Senate dealt with companion legislation, legislation, SB 2160 (https://bit.ly/36LOX47o), in early November, in early November 2019, so there appears to be some traction behind this very common sense idea. The House is proposing to appropriate $304 million to help make this retrofit occur. To read through the House's bill, please visit https://bit.ly/2rJLTXJ.

RESNET – After years of development and public review work, Addendum 30 has finally been adopted. This quality assurance update to the Home Energy Rating System (HERS) Program includes the elimination of QA delegates, and it revises procedures around QA reviews. To read the entire 42-page document, please visit https://bit.ly/34wgCEF. The transition period for the new policies began on Jan. 1, 2020, but the mandatory compliance date isn't until July 1.

In related news, Addendum A was approved for use with ANSI/RESNET/ICC 301-2019. It revises the criteria of the standard to correlate with current DOE testing and calculation requirements and FTC labeling requirements for clothes washers, dryers and dishwashers. Voluntary compliance went into effect on Oct. 1, 2019, and like Addendum 30, mandatory compliance goes into effect on July 1, 2020 You can read the eight-page addendum at https://bit.ly/36BtkUa. **GB**

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

IAQ: Breathe Easier

Products, Research and Advice for Improving Indoor Air Quality

Air Pollution Causes Hide in Plain Sight

Getting rid of pollution improves public health a lot faster than you'd think.

BY EMILY PONTECORVO

AFTER DECADES OF STEADILY DECLINING, air pollution is once again on the rise in the United States. Between 2016 and 2018, pollution of fine particulate matter—tiny particles that are emitted whenever we burn anything—rose by more than 5 percent.

That news from the National Bureau of Economic Research is terrible for Americans' health. The researchers who identified the increase in pollution calculated that it was linked to 9,700 additional premature deaths in 2018. Worldwide, outdoor air pollution is responsible for an estimated 4.2 million deaths per year. It affects nearly every organ in the body, and can cause or contribute to stroke, heart disease, lung cancer and chronic respiratory diseases.

The good news is that scientists have repeatedly found that improving air quality has quick and significant benefits for public health. A new analysis of the literature on pollution reduction published in the *Annals of the American Thoracic Society* shows that as soon as two weeks after a source of pollution is removed, many respiratory symptoms experienced by the surrounding community disappear and hospital visits are reduced. Within as little as two months, mortality drops as well.

The paper looks at several cases where a temporary reduction in pollution was the only change in a community that could account for major differences in health outcomes. For example, when a steel mill in the Utah Valley closed for just 13 months from 1986 to 1987, hospitalizations for pneumonia, bronchitis, and asthma went down, especially for children. School absences were reduced by 40 percent. Women who were pregnant during the year the mill was closed were less likely to have premature births than those who were pregnant before or after. And there was a 16 percent decrease in overall mortality.

When the Summer Olympics were held in Atlanta, Ga., in 1996, the city closed the downtown area to private vehicles and upped its public transportation system to run 24 hours a day, with additional bus services. The closure lasted only 17 days, but peak daily ozone concentrations went down 28 percent. Over the next month, children sought care for their asthma 42 percent less frequently, pediatric emergency room visits went down by 11 percent, and overall hospitalizations for asthma went down by 19 percent.

These numbers make a powerful case for reducing air pollution—especially because there's next to nothing people can do personally to avoid it. That's especially true for vulnerable populations who live near industrial zones, highways, and power plants because the real estate is affordable there, or because those big polluters set up shop in their neighborhoods because of structural racism.

Asthma improvement. Reducing traffic in popular areas for just a few weeks leads to fewer asthma cases among children just a month later, researchers note.

Burning bright. Cities worldwide are taking clean air actions, including updating transits and school buses to run on cleaner-burning fuel.

There's a range of interventions that can help, and some of them are already being implemented on a local scale, like car-free streets. San Francisco recently voted to shut down the central artery of Market Street to private cars. New York City is experimenting with doing the same to Manhattan's 14th St. In Oslo, Norway, the entire downtown is now basically car-free. Smoking bans, cleaner fuels for school buses, and switching out fossil-fuel burning home heating systems for electric ones have also been proven to improve health outcomes.

The federal government could help by enforcing the Clean Air Act stringently (instead of, you know, rolling parts of it back). The researchers who identified the recent reversal in air pollution found that the Environmental Protection Agency's actions against polluters have been falling since 2009. They also attribute the increase in pollution to the rise of natural gas and an increase in driving. So developing a national climate policy to use more renewable energy and electrify buildings and cars won't just slow global warming, it will literally save lives—and fast. GB

This story originally appeared in the Dec. 6, 2019 issue of Grist. Emily Pontecorvo is the publication's news and politics reporter.

CREDIT: MAVERICK PHOTO AGENCY/FLICKR

Breathing uneasily. As pollution levels rise again, clean air is becoming a bigger concern by the public—and a greater priority for governments and scientists.

AD INDEX

COMING NEXT ISSUE

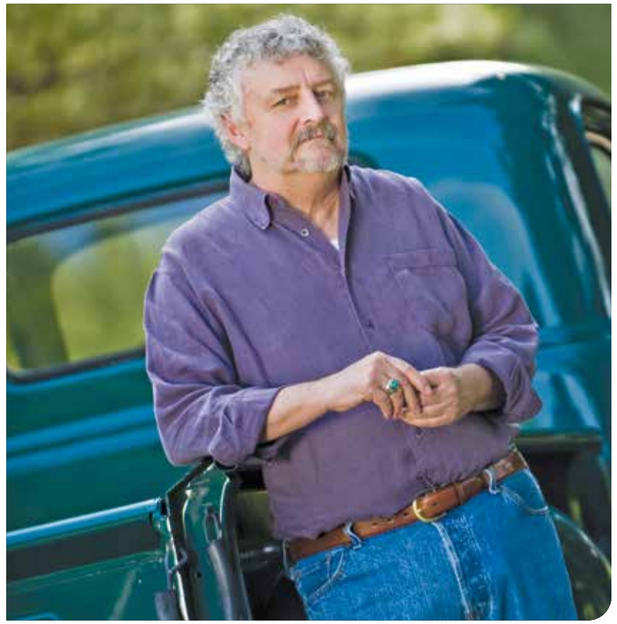
GREEN BUILDER®
The Hot 50

In *Green Builder*'s annual Hot 50 Products roundup, we highlight upgrades and innovations in product design. And in our Readers Choice survey, you tell us which companies are the greenest of them all.

2020 Editors' Choice
GREEN BUILDER® HOT50 PRODUCTS

By Ron Jones

Use a Sensible, not Senseless Marketing Strategy



THEY SAY IT MAY BE the most overused cliché of all. You know it well: "The definition of insanity is doing the same thing over and over again and expecting a different result." Although the quote is generally attributed to Albert Einstein, there is no proof that he really said it. But whether it indicates actual insanity or merely foolishness, the act itself makes little sense.

I'll give you an example. I have long been confounded by the willingness of building product manufacturers who repeatedly swallow the notion—hook, line and sinker—that the golden fleece of success they're pursuing is theirs for the taking if they can just get "access to builders." This is a myth that is wickedly perpetuated by trade associations and a vast array of snake oil salesmen, each pandering their own secret sauce with promises that builders will find it irresistible.

I can't begin to remember all the gifts that were showered on me by salespeople and others representing various building product brands over the course of my decades-long building career in hopes I would be persuaded to purchase their goods. I have long since lost count of the nice work jackets, fleeces, shirts, caps and other workwear that I've donated to shelters and social services organizations in hopes that someone could find them valuable and useful.

Sorry to break the news, but I never made a specification or buying decision based on the swag somebody was handing out—no matter how nice it was—nor the free lunch or beer that flows at industry events and promos. But even if I had, and even if some builders do, you're barking up the wrong tree to begin with. The truth is that as time goes by, more of the building product choices are being made, or at least heavily influenced, by other players in the transaction.

I think we can agree that the most-disruptive force in the building industry in the last few decades is the easy access consumers have to infinite information via the internet. Buyers are increasingly savvier than ever and are oftentimes armed with more and better facts than the builders they're talking with. Additionally, the building business evolves at such a breakneck pace with new technologies, systems, products and building science that builders can't possibly keep up with all the new developments. They have been forced to depend on their suppliers and subcontractors to provide critical assistance in decision making and selections, just to attempt to keep up.

Yet, it's amazing how many marketing departments and outside agencies still swallow the Kool-Aid and believe that the Holy Grail is within reach if they can only outflank the competition by capturing the attention and imagination of their elusive traditional quarry. They'll try almost anything to differentiate their offering, but sadly, there is very little originality—just the same old tired exercises that haven't been working up to now.

Think about who your true customer is. Who is ultimately going to use whatever it is you have to offer? Hint: It's not some mythical, one-size-fits-all character out of the previous century.

Not sure who said it, but "hope is not a strategy." You can't repeat the same ineffective messages and employ worn out techniques if you realistically expect to change the outcome. It doesn't take Einstein to figure that out. GB

Panasonic

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