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GREEN BUILDER[®]

March/April 2020 / www.greenbuildermedia.com



HOT50 PRODUCTS



As the COVID-19 crisis peaks, the need for energy-efficient products and resilient home design has never been more clear. Here's our annual selection.



ALSO IN THIS ISSUE: OUR FIRST ANNUAL BRAND INDEX RESULTS



Build with less waste. Create a cleaner world.

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.

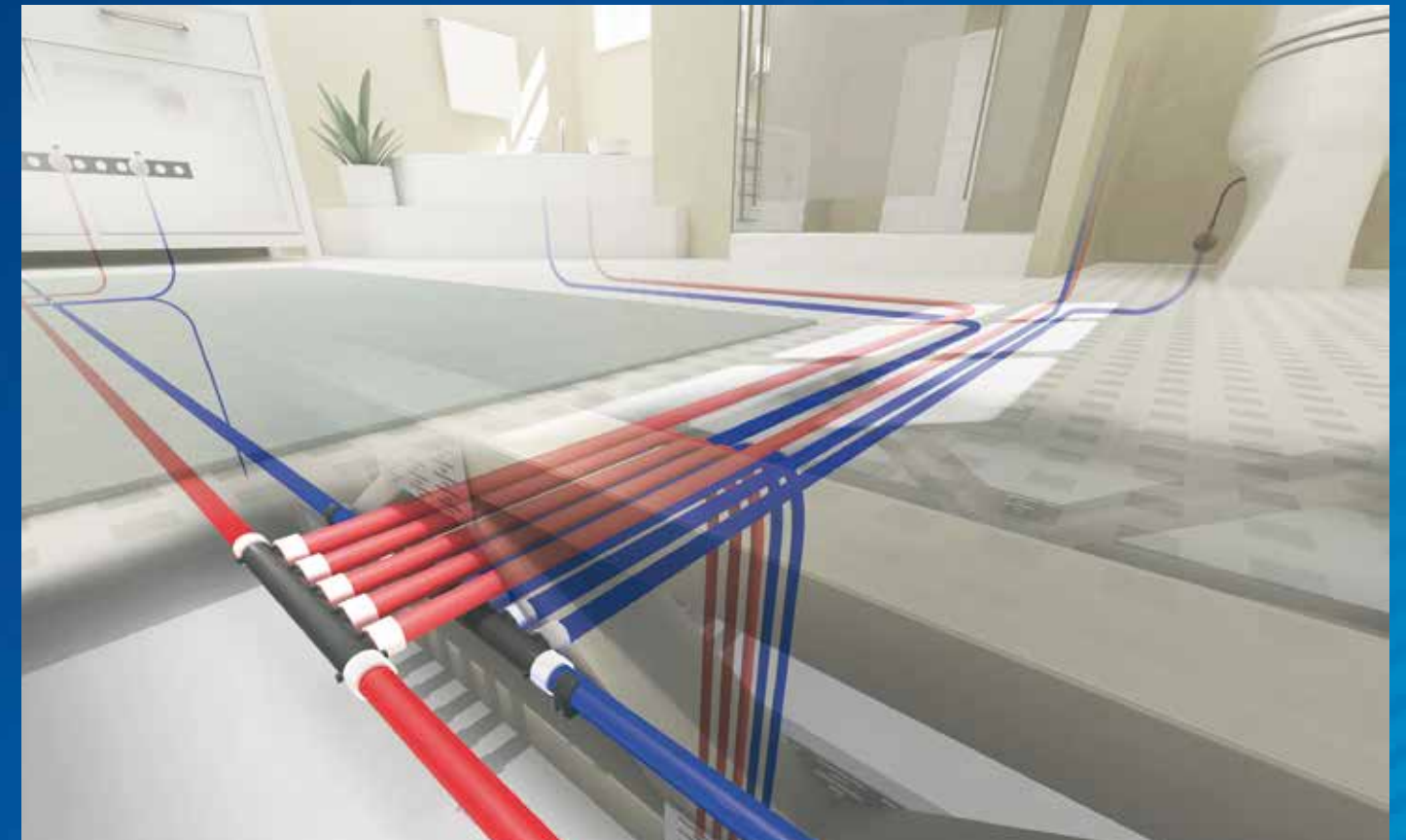
Located in Enumclaw, WA (the gateway to Mount Rainier National Park) the VISION House Seattle Cascades features the most advanced products, systems, and technologies to achieve extraordinary performance results – all at a reasonable price point. The net-zero, solar powered, high performance, resilient, 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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PROJECT SPONSORS:



Toilet Paper is Not the Answer

It's time to examine what resilience really means.

BY MATT POWER

STANDING IN LINE at the local discount store the other day, I watched a woman in her late 60s struggle to pile hundreds of rolls of toilet tissue onto her shopping cart. Terrified by the coronavirus, she didn't know what else to do.

She's in good company. Stores around the country report running out of toilet paper, cleaners, tissues and sanitizers—almost as fast as they're vacating their canned goods and powdered eggs.



But is this really the best we can do, faced with the first real test of our national courage since World War II?

Rather than freaking out at the midnight hour when a pandemic, wildfire, power outage or some other crisis strikes, we can create safe and secure homes that are easy to heat and cool, well ventilated, fire and storm resistant, with well stocked pantries and freezers. The resilient home has Net Zero performance, with on-site renewable power and a generator or battery backup to run critical systems such as well pumps, refrigeration and (in extreme climates) cooling or heating.

In keeping with this issue's collection of outstanding products, materials and brands, let me offer a few examples of how specific items and design elements in a resilient home might reduce crisis anxiety:

- The resilient home has toilets and appliances that use very little water or energy. It has a clothesline.
- The resilient home has bidets attached to every toilet. There's not a roll of toilet paper in the house.
- The resilient home captures the sun's energy with photovoltaic panels panels, or it has wind turbines. The power is stored in the electric car in the garage or other battery system. No gasoline available? No problem.
- The resilient home is Net Zero, with well-integrated ventilation, including self-contained solar attic vents and a sump pump with battery backup.
- The resilient home is heated and cooled by super-efficient, variable speed heat pump technology.
- The resilient home, if it has a pool, uses a variable speed filtration pump, capable of low-wattage operation.
- The resilient home has a metal roof, fiber cement siding, fire suppressing sprinklers indoor and out, and anti-ember soffits. It's virtually fireproof.

You get the picture. Add a greenhouse garden a food storage pantry and a couple of chickens, and this house promises a safe and comfortable haven, even during long periods of isolation. If that sounds eccentric or extreme, try the concept on your next clients. I'm betting that given the chance to do something more effective than hoard toilet paper, they'll thank you for your forward thinking. **GB**

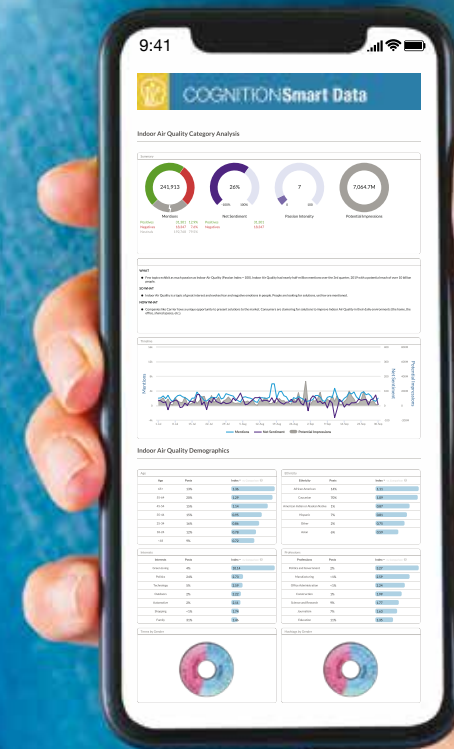
Panic purchase. Can't we give homeowners more resilience in their homes so that buying toilet paper (and every other paper product) isn't their first reaction to a crisis?



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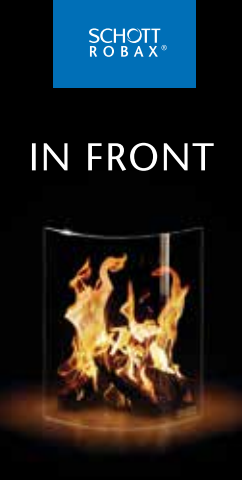
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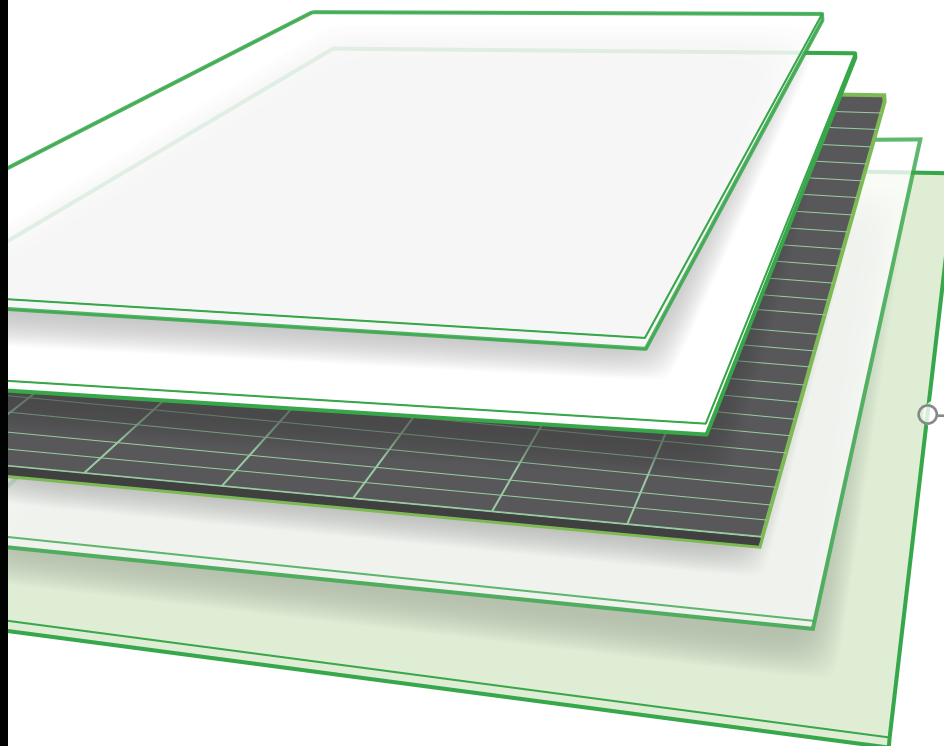


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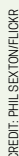
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A little good news: Green projects excelled in 2019.

The report is available at <https://bit.ly/3dDvg2J>



As living costs go up, and the economy tumbles, the odds of home ownership are going down.



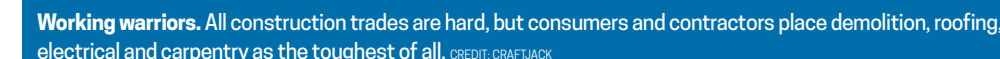
The report is available at <https://bit.ly/2UK11Pg>

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No matter what the trade or specialty, most construction work requires intense physical labor.

Twenty-three percent of electricians believe their jobs to be the hardest to learn, as did 38 percent of consumers. Various other occupations (21 percent each by contractors and consumers) and carpenters (13 percent and 12 percent, respectively) were also deemed “Most Difficult to Master.”

The survey can be found at www.craftjack.com.



The polyurethane-eating bacteria could offer a better way to deal with Earth's plastic overload.

PHOTO BY ADRIAN WARD

The institute's study appears in the journal *Frontiers in Microbiology*.

GREEN BUILDER®

Volume 15, Issue 2
March/April 2020
Published by Green Builder® Media

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ISSN 1559-4971

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These are the “go-to” companies our readers trust to do the right thing with product performance, durability, clean manufacturing and environmental stewardship.

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“There is a growing movement towards increasing renewable energy portfolios, net-zero energy and net-zero carbon emissions...they’re still on the books, and people are working towards those goals as you read this.” **PAGE 59**

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2020 Editors' Choice GREEN BUILDER® HOT 50 PRODUCTS

In a time of anxiety and change, innovations that promise resilience still matter.

BY GREEN BUILDER STAFF

R

EMEMBER A FEW MONTHS AGO, when we seemed to have different priorities? When things that now seem trivial seemed to matter so much? Our team at *Green Builder* intends to keep moving forward, to inspire the shelter industry prepare for its inevitable recovery. One way to do that is to highlight product innovation that makes homes more energy efficient; more water-efficient; in short, more resilient. Our role in society—providing safe, affordable shelter—is essential. Here are 50 products that can help jump start and improve the post-pandemic building industry.



▲ Bocchi *Classico 30* Fireclay Kitchen Sink

Want a cast iron sink without limited design? Take a look at Bocchi's *Classico 30*, an apparent stylish twin to the ever-faithful dark metal basin found in many homes. But there's more than meets the eye with *Classico 30*, starting with its composition. The sink's chief component is fireclay, a 100 percent organic and recyclable material. What material? Mud.

Thanks to intense heat—think 2,000 degrees Fahrenheit—and a number of other natural elements, the mud has been turned into a non-porous, scratch-resistant material that fits into a traditional sink opening in the kitchen. And of course, it's heat resistant, meaning there is no problem placing that piping hot pan or pot directly from the stove oven onto the surface.

The item is also constructed without a lip, making it possible to simply wipe items into the basin from the counter, and it's finished on all four sides, making it reversible. It's available in traditional colors such as matte white, as well as more-unique (and eye-popping) finishes such as sapphire blue.

For more information: WWW.BOCCHIUSA.COM

BATHROOM FIXTURES

◀ Durat Counter Surface Material

Smooth countertops, particularly those made with wood or manufactured materials, are great in appearance but often suffer from durability issues. In steps Durat with its self-named line of solid surface material that can be used for countertops, sinks, bathtubs, shelves and more. Although its 28 percent recycled content might seem low compared to other types of surfaceware, the goods are fully able to be put back to use in some other form, keeping environmental waste to a minimum.

Available in the United States through distributor CaraGreen—itsself a highly green-thinking company—*Durat* comes in more than 70 solid colors but can be customized to match any color, size or thickness. There are also speckled options—also made with recycled content—that work well with midcentury modern and contemporary aesthetics.

Durat even buys the used product back from vendors and distributors, making for a completely closed loop on the environmental scale. Meanwhile, installers are eligible for LEED credits, making *Durat* a very green deal for them as well.

For more information: WWW.DURAT.COM and WWW.CARAGREEN.COM



▲ Nasoni *Fountain Faucets*

Nasoni Fountain Faucets are the world's first such items and they are quite the sight. With the flip of a switch, the product's patented Dynamic Fountain Flow Technology redirects the path of water from the downspout to the fountain hole at the top of the downspout. Washing a face, brushing teeth, shaving or simply taking a drink just became a lot easier—and a lot more efficient.

When used in fountain mode, the faucet uses 88 percent less water than existing faucets. The potential water saving in the U.S. could be as high as 136 billion gallons annually just from toothbrushing alone, which is the equivalent of over 9 million backyard swimming pools.

Nasoni can reduce the possibility of sickness and ill health, for consumers and installers. Water fountains are self-cleaning; simply turn them on and anything present is rinsed away, providing access to clean drinking water without the nasty airborne germs.

For more information: NASONI.COM

▼ 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 called 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.

For more information: NIAGARACORP.COM





◀ American Ground Screw Ground Screws

It's no secret that building anything requires strong support structures, and that putting those structures in place can take a lot of concrete—something that is not all that environmentally friendly. But American Ground Screw offers a solution with its ground screw system, which is capable of creating the same level of support without the need for concrete footings or excavation. That means far less environmental damage, as well as lower construction costs.

The ground screws are useful with a variety of light industrial projects, from anchoring wooden structures to fencing, footbridges and storage containers. Structural foundations can be installed in minutes: just mark the location, drive the screw and start building. The easier installation means a faster completion, as well as fewer hands on the job—two more cost cutters.

Disassembly is just as easy, and the screw system is reusable. That means almost no demolition or recycling costs for removal.

Meanwhile, American Ground Screw just became the first ICC-certified Ground Screw Foundation System in North America, a distinction the company believes will greatly expand the use of ground screws beyond engineer-stamped projects in professional and DIY construction application.

For more information: AMERICANGROUNDSCREW.COM

CONSTRUCTION AND TRAINING AIDS

▶ FSI GreenFire Fire Suppressant

GreenFire® fire suppressant is everything its name implies. Unlike many other chemicals used in firefighting, *GreenFire* doesn't harm the environment, waterways, people or animals. Its non-corrosive, specialized foam composition has even been certified by NSF International as being safe around food. That's great news for homeowners, people with pets or anyone who is into recreational activities, and even people who build and service homes.

Capable of functioning as a fire suppressant and retardant, *GreenFire* is especially useful for high-fire risk areas with heavy consumables or flammable building products—such as in-wall use during plumbing repairs. The product adheres to surfaces of any angle to smother flames completely. The foam also soaks into porous materials and removes heat far quicker than other suppressants. After usage, cleanup only require a little soap and water, according to NSF.

Fire Suppression Innovations (FSI) offers *GreenFire* through a number of products, from portable stainless steel fire extinguishers—certified effective against Class A and B fires, with Class D and K certification pending—to vehicular units.

For more information: WWW.FIRESINC.COM



▶ Embodied Carbon in Construction Calculator (EC3) Tool

How much of an environmental impact will that home or building have? There's now a way to find out. The *Embodied Carbon in Construction Calculator (EC3)* tool is a free and easy-to-use item that allows benchmarking, assessment and reductions in embodied carbon, focused on the upfront supply chain emissions of construction materials. Architects, engineers, owners, construction companies, building material suppliers and policy makers will have the information needed to make more-informed decisions on exactly what types of products and property design is best for a given area.

The *EC3* tool utilizes building material quantities from construction estimates and Building Information Modeling (BIM) models, and a robust database of digital, third-party verified Environmental Product Declarations (EPDs). Powered by this data, *EC3* can be implemented in the design and procurement phases of a construction project to look at a project's overall embodied carbon emissions, enabling the specification and procurement of the low carbon options.

EC3 also helps owners balance their finances with the ability to have a house created that is as green as possible. Users can gauge the degree of a home's sustainability against the cost of construction, allowing them to tailor the design to what works best for the environment and the owner's pocket book.

For more information: WWW.CARBONLEADERSHIPFORUM.ORG



◀ SimScale Engineering Simulation Platform

It's not easy to design a home, and even harder to draw up one that's green. SimScale offers a self-titled, cloud-based simulator which makes it easier for building professionals and architects to validate designs, test performance, optimize durability and improve efficiency before they start building. This saves on materials, waste and rebuilds or reworks.

The all-in-one platform is accessible through any PC browser and offers more than 300,000 simulations, as well as access to a library of resources, expert advice and tutorials. An easy-to-use interface includes a step-by-step coaching for first timers. And, the platform supports parallel processing, meaning the user can run simultaneous simulations to compare the benefits of different designs.

SimScale supports all standard 3D files, meaning designers can continue to use their preferred computer-aided design (CAD) software. The platform is updated every time the browser is refreshed, meaning the user always has access to the latest information.

For more information: WWW.SIMSCALE.COM





◀ LG Chem *RESU 10H* Solar Battery

LG Chem has been a player on the solar battery scene for some time now, and its *RESU* power cell is a major part of the North American market. But the company has upgraded its *RESU* line with a foray into the high-voltage arena (*10H*), making it an even greater option in residential energy storage.

The *RESU 10H Type R* is a powerful player: It utilizes 10kWhr of lithium ion cells rated to 6,000 cycles or more, and the *RESU* system is modular, allowing multiple battery products to be added to a storage setup if energy demands require it. The batteries are capable of peak shifting for charging during off-peak times and discharge during peak times. And, the batteries can be integrated with renewables, allowing for stabilizing intermittent power by alternating between charging and discharging.

RESU's compact and lightweight nature is designed to allow easy wall-mounted installation. The inverter connections have also been simplified, reducing installation time and costs. Each battery retains at least 80 percent of Nominal Energy for 7 years after the date of invoice and at least 60 percent of Nominal Energy for 10 years after install.

For more information: WWW.LGCHEM.COM



◀ Panasonic *EverVolt* Residential Energy Storage System

Panasonic, the world's largest maker of lithium-ion batteries, is taking a universal approach with its *EverVolt* residential energy storage system. The new solar product is compatible with any solar system or inverter and can be tailored to a homeowner's individual needs.

The company is offering *EverVolt* in AC- and DC-coupled versions, both of which can be scaled down to 5.7kWh of energy storage or expanded to 100kWh. The 5.7 kWh "mini" version has an average backup capability of three hours, the 11.4 kWh "standard" version can run six hours and the 17.1 kWh "plus" model stores up to nine hours of reserve power. The DC version allows unused solar panel-collected energy to flow directly to the battery, an efficiency plus.

In addition, *EverVolt* requires only a one-person installation and is field serviceable. It also comes equipped pre-programmed time-of-use settings to help manage energy consumption and operating cost, advanced software and a user-friendly app for homeowners, allowing customization between multiple operating modes' visibility into system status.

For more information: WWW.PANASONIC.COM

ENERGY MANAGEMENT AND PRODUCTION

▶ Generac *PWRcell* Smart Battery

Backup batteries are pretty much a requirement for anyone who wants to get the most out of a photovoltaic system when the sun isn't out. But they can be unwieldy and hard to upgrade if energy needs change. Generac's *PWRcell* offers a customizable power storage system that breaks a few rules but not installers' backs or homeowners' budgets.

PWRcell's modular battery pack system ranges from 8.6kWh to 34.2kWh, and can be increased as needed by simply adding more battery packs to the unit. There's a lot of power potential here: The lightest-capacity configuration has enough surge power to start an air conditioner or sump pump and offers enough continuous output to run most homes.

Meanwhile, the heaviest individual component of the system weighs less than 75 pounds, compared to components that weigh several hundred in competitors' systems. Those units typically require at least two installers, making installation more expensive for consumers and more labor intensive for contractors.

And, an optional, downloadable *PWRview* app enables users to track power generation, daily energy consumption and battery usage, giving homeowners a way to keep their energy bills in line with their household budgets.

For more information: GENERAC.COM



▶ Sunflare *PowerFit 20* Flexible Solar Panel

Standing seam metal roofs have proved to be challenging for solar installs due to the logistics of how to install racks without ruining aesthetics. Sunflare's *PowerFit 20* flexible solar panel conquers those problems. Designed to be practically invisible upon install, *PowerFit 20* is custom fit to sit between the seams of the roof and can cover the entire thing, regardless of length.

There are also no roof penetrations needed, making installations fast, easy and low cost. The modules' butyl adhesive backing provides a secure hold that can withstand gale force winds. Because the modules are less than 2 millimeters thick—15 times thinner than silicon panels—and only about one-third as heavy, staging at the installation site takes less than one-quarter as long as staging with traditional panels.

As with all Sunflare modules, *PowerFit 20* includes a bypass diode for each individual cell—when a cell is shaded, only that individual cell is inactive. Traditional solar panels have a bypass diode per string of cells, meaning that if just one cell is covered, the whole string will not produce power. If the shade is across a single row, the entire panel can be knocked out.

For more information: SUNFLARE.SUNFLARESOLAR.COM/POWERFIT-20





◀ ecoearthwalz Prefab Earth Walls

One could use the cliché about how ecoearthwalz' product is dirt cheap. But instead, we'll stick to the fact that this company's construction component is as nature friendly as anyone could hope to find. These prefabricated earth walls are literally made with sub-soil and water. The manufacturer puts them on par with the Great Wall, which has survived for thousands of years without cement or rebar. No one is looking for that kind of longevity here, but they could last "most likely longer than you live."

Once suitable foundation and stem walls are in place at construction site, prefab earth walls up to 2 feet thick, 80 inches long and 10 feet high are delivered to site and installed. Walls for a single-story house can be installed within hours. If desired, walls can be painted and waterproof walls with all-natural eco-friendly materials.

Earth walls are nontoxic and mold-resistant, fireproof, soundproof and pest proof, and can withstand hurricanes, tornadoes and earthquakes, depending on structure. They also have a strong thermal mass, which helps to passively regulate internal temperature and humidity, reducing use of mechanical heating and cooling.

For more information: ECOEARHWALZ.COM



◀ LATICRETE Strata Heat Thermal Flooring

Cold tile can be a shock to the system during cooler months. To combat that, LATICRETE offers the Strata Heat thermal flooring system, designed to keep floors warm in an environmentally friendly and cost-cutting fashion for homeowners.

The four-part system includes the *Strata Heat Thermal Pack*, which combines the company's Thermal Diffusion Technology with its *Strata Heat Wire* and adhesive to uniformly distribute heat to eliminate cold spots and quickly achieve the desired floor temperature. Homeowners can lower kilowatt usage and reduce energy costs by up to 15 percent.

The *Strata Heat Wi-Fi Thermostat* can control the floor's heat with a smartphone app or GPS technology, and check energy statistics on the go. The thermostat learns homeowner routines to apply the most-efficient settings and reduce heating usage by up to 25 percent.

And the *Strata Heat Mat* utilizes mortar hydration vents that create a mechanical bond between the mat and adhesive mortar. This allows the mortar to cure faster and provides a stronger tile bond for a faster time to grout while using the appropriate mortar for the installation. The mat also allows installers to see the amount of mortar coverage underneath the mat during installation.

For more information: LATICRETE.COM

FLOORS, WALLS AND SURFACES

► IceStone Recycled Glass Surface

That beer bottle could be your next countertop. Surface maker IceStone offers a line of self-named surface material that is made from 100 percent recycled glass. Although it is primarily used for kitchen counters or bathroom vanities, clients lately are also seeking IceStone surfacing for conference tables, desktops, window sills and benches.

The product includes non-toxic pigments for design, and is free of petrochemicals and plastic resins. *IceStone* was recently upgraded to where it no longer needs annual resealing by the owner—the process is performed initially at the IceStone factory and is permanent—making it more UV stable and environmentally cleaner.

IceStone's green philosophy extends to its operations. The factory is day lit with skylights to reduce energy consumption, recycled water is used in the production process, and nearly 90 percent of company waste is put back to use in some fashion. An estimated 13 million pounds of glass has been diverted from landfills since the company's launch in 2003.

For more information: ICESTONEUSA.COM



► Mohawk EverStrand Carpet

Most carpet, when its term of service is done, ends up in the landfill. Mohawk has a tradition of producing products that are safe and sustainable for the environment, and it continues the green journey with its latest line of *EverStrand* carpet. *EverStrand* is the industry's only all-post-consumer-face Polyethylene Terephthalate (PET) fiber product, made of recycled plastic bottles.

Make that a lot of bottles. The company estimates that 1 in 4 plastic bottles in North America become *EverStrand*. About 30 bottles are recycled to make one square yard the product. Fourteen thousand turn into *EverStrand* each minute. Three billion are manufactured into the carpet annually, and 24 billion have been recycled since 1999. That's a lot of unused landfill space.

The carpeting and rugs are also known for their softness, ease of cleaning and stain resistance, wide variety of styles and colors (at last count, more than 2,000), and the fact their production process consumes zero virgin petrochemical resources, meaning minimal environmental impact. It also carries a CRI Green Label Plus certification.

For more information: WWW.MOHAWKHOME.COM



◀ Zena Forest Products Hardwood Flooring

With wood flooring, homeowners are increasingly gravitating toward extra-wide planks and locally sourced product. Zena Forest Products meets those criteria with its engineered hardwood flooring line, designed to withstand seasonal temperature and humidity swings.

The flooring design blends durable construction with local materials from ecologically sound sources and is aesthetically "show-stopping." Fashionable and functional, Zena's engineered hardwood floors also provide a more-sustainable flooring option because they use nearly three times less lumber than solid hardwood flooring, allowing Zena to stretch the precious resource of local trees.

Dimensional stability is another plus. With wider planks, too much seasonal movement can cause gaps in the seams, roughness and squeaky floors. With Zena's site-finished, engineered flooring, the seams between the boards disappear, leaving a monolithic and mostly impermeable surface. Zena's engineered floors have a 3/16-inch hardwood wear layer that is laminated to an 11-layer plywood core on the back. The plywood provides the necessary stability in the floor, and the extra thick wear layer means the floor can still be sanded and finished just as many times as a traditional solid floor. And, down the road, it means peace and quiet.

For more information: WWW.ZENAFORREST.COM/FLOORING1

► A.O. Smith ProLine Electric Tankless Water Heater

A.O. Smith's ProLine Electric Tankless water heater line is the company's first foray into on-demand electric hot water. That entry includes smart features like "Dry Fire Protection," which ensures that the heating element will not turn on unless the tank is full of water.

Key to this innovation is a pre-heat function that reduces the call for a large "surge" of electricity when water is called for. 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).

Also, all models have Scale Reduction Technology, which reduces scale formation on the elements and on the chamber walls, extending durability of the unit. And, the units do not contain moving parts or screens—further reducing the likelihood of scale-related service problems.

For more information: WWW.HOTWATER.COM



HEATING, COOLING AND INDOOR AIR QUALITY



▲ Friedrich Smart Room Air Conditioners

For all of its Wi-Fi-enabled product lines, smart air conditioner frontrunner Friedrich Air Conditioning Co. is unveiling an updated, simple-to-use wireless platform interface, making it intuitively easy for customers to control their A/C units via their smart devices and set their comfort level from anywhere, at any time. Friedrich's new platform will also be compatible with Amazon Echo and Google Home.

Customers with Kühl, WallMaster, Chill Premier and Uni-Fit products can now choose from Friedrich's wide variety of room A/C units that are either window or through-the-wall options, ranging from 5,200 to 35,000 BTUs, and from models designed to fit nearly any budget.

Each line also features the company's "QuietMaster" technology, designed to operate up to 45 percent more quietly as compared to competitive room A/C units. QuietMaster reduces operating noise through exacting manufacturing standards that include using dense, sound-blocking insulation, a quiet rotary compressor, steel inner walls, a completely-enclosed commercial grade fan motor, insulated air plenum (to prevent noise intrusion), motor mounting techniques that eliminate extra vibration and a blower wheel housing made from solid steel.

For more information: WWW.FRIEDRICH.COM

▼ LG Multi V 5 Heat Pump System

Heating and cooling represent the biggest energy users in most 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, 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.

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.

For more information: LGHVAC.COM



◀ Mitsubishi Trane SLZ-KF Four-Way Ceiling Cassette

Call it an "air affair," times four. Mitsubishi Electric Trane HVAC US (METUS)'s new SLZ-KF Four-way Ceiling Cassette, part of the M-Series residential product line, offers homeowners flexible airflow patterns with two-, three- or four-way vane controls.

In addition to promoting sustainability through energy efficiency, the ceiling cassette helps to better the environment within a home through improved indoor air quality and reduced operating noise. The SLZ-KF Four-way Ceiling Cassette uses a new 3D-turbo fan to operate at noise levels as low as 25 dB(A).

Owners also have the option of applying the METUS 3D i-see Sensor™, patented technology with the ability to scan a room's thermal profile and adjust conditioning accordingly: The SLZ-KF kicks on when heat signatures are detected and switches into setback mode when the room is unoccupied. This results in an even temperature distribution and a more energy-efficient operation for homeowners.

The SLZ-KF also benefits contractors with features for simplified installation. Temporary hanging hooks, captive screws and a larger wrench turning radius on piping contribute to an easier installation process.

For more information: WWW.MITSUBISHICOMFORT.COM

► Noritz NRCR Condensing Tankless Water Heater

Noritz engineers take their job as innovators and quality controllers seriously. 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.

For more information: WWW.NORITZ.COM



▲ Panasonic Cosmos Healthy Home System

Cosmos Healthy Home System is Panasonic Life Solutions Company America's vision for a suite of indoor air quality (IAQ) products, representing a realignment of the company's new and existing technology. 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.

The unit 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.

Cosmos is fully customizable, adaptable to any size home.

For more information: NA.PANASONIC.COM/US/COSMOSTM-HEALTHY-HOME-SYSTEM



▼ Rinnai I Series Boiler

Always an innovator, Rinnai continues to provide homeowners with solutions that are designed to promote comfort while advancing domestic hot water production through compact design, ease of installation and service, and use of emerging technologies. Add the company's *I-Series Boiler* line to the list of accomplishments.

The *I-Series Boiler* has a unique advantage to homeowners with the ability for simultaneous usage of home heating and domestic hot water production. That means if the heat is running and someone in the home wants to take a shower, the heat is not interrupted as it is with many traditional boilers in existing homes. The technology also includes an innovative bypass servo valve, which enables precise control of the hot water temperature. This boiler is available in both combi and heat-only models and comes standard with multi-zone heating control.

As with Rinnai's best-selling tankless water heaters, the company manufactures many of the key components and utilizes high-quality materials. This further enables Rinnai to maintain control of the quality of the product.

For more information: WWW.RINNAI.US/I-SERIES-BOILER



▲ Rheem Ultra Low NOx Gas Furnace

Rheem's *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, the *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.

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. In addition, a burner constructed of 100 percent high-grade stainless steel is virtually impervious to scale and mineral buildup for the life of the water heater. Its unique side port design promotes even flame distribution and optimum heat transfer.

For more information: WWW.RHEEM.COM

▼ Speck 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 this offering from Speck Pumps.

The *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.

For more information: USA.SPECK-PUMPS.COM/MODEL-A91-VSP



COM/MODEL-A91-VSP

► Flo by Moen Smart Water Detector

Moen and partner Flo Technologies have become household names in home water security. Its *Flo by Moen Smart Water Shutoff* already gives homeowners a way to detect leaks and turn off household water via their smartphones to prevent damage to walls or floors. Now, the company's *Smart Water Detector* ups the ante.

Smart Water Detector is a standalone, 3.5-inch sensor that can be placed anywhere in a house to alert users if, and when, it detects moisture to help prevent water damage and loss. If the detector senses the presence of water, freezing temperatures or high humidity, it will alert users through a push notification in the Flo by Moen and Moen smartphone apps. Homeowners can use and connect multiple detectors within their home and if they also have the *Smart Water Shutoff*, a leak sensed by the *Smart Water Detector* can automatically trigger the shutoff feature to protect the home from water damage.

The *Smart Water Detector* can also work independently from the *Smart Water Shutoff*, giving consumers the opportunity to achieve smart home water management at any reasonable budget.

For more information: WWW.MOEN.COM



▲ LeakSmart Leak Detection Tool

Water damage is no fun—ask any homeowner who has spent thousands of dollars repairing walls or floors, or replacing furniture due to an exploded pipes or cracked water lines. *Protect by LeakSmart with Flow* is a leak detection system designed to automatically prevent such disasters.

A key innovation is *LeakSmart*'s auto-shutoff capabilities. 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 can prevent rapid and costly damage that results in significant wasted 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.

Another innovative feature of this system is its ability to continue monitoring for leaks during a power outage, as there is battery power for the hub and the shutoff valve. Homebuilders and homeowners alike are protected with *LeakSmart*'s five-year manufacturer's warranty when purchased and installed by a professional installer.

For more information: LEAKSMART.COM

INSULATION AND LEAK PREVENTION

► Icynene X-Wall System

Icynene-Lapolla, manufacturer of high-performance, energy-efficient building envelope solutions, continues the trend with its *Icynene X-Wall System*, an all-in-one continuous insulation that provides long-term power savings and protects the structure from nature's elements.

Icynene X-Wall is comprised of high performance, closed cell spray polyurethane foam and flashing. Combined with *Icynene*'s *ProSeal* HFO spray-applied insulation and liquid flashing, the complete system serves as thermal insulation, tightly sealed air barrier, class II vapor retarder and water-resistant barrier.

The *X-Wall* liquid flashing is a high-quality, gun grade, elastomeric, polyether liquid-applied flashing and detailing membrane. Used for doors and windows, the material bonds to the majority of construction materials including aluminum, brick, concrete, wood, vinyl and exterior gypsum board. *Icynene X-Wall* meets the International Energy Conservation Code (IECC), which requires continuous insulation in the building envelope in most climate zones.

Icynene X-Wall also helps protect the structure from moisture damage. The system meets stringent ICC criteria for foam plastic insulation to qualify as a Water Resistive Barrier (WRB). The system also offers the spray foam industry's first 15-year thermal warranty.

For more information: WWW.ICYNENE-LAPOLLA.COM



► Phyn Smart Water Assistant

The *Phyn Smart Water Assistant* is Phyn's new do-it-yourself, whole-home smart water monitor system that provides powerful leak detection and detailed insights on water usage data, all in a compact form that's easily installed under a kitchen sink. With Phyn, users can see exactly how much water they are using in the shower, when washing dishes or watering the lawn so they can take direct actions to conserve water and save money.

There's even more smartness to this water assistant. In the event of a major leak, SWA can connect homeowners to a local plumber in minutes. Over time, the tool learns a home's system and shares water usage down to each fixture. SWA's patented pressure sensing sees ice crystals forming in pipes before they have a chance to freeze and burst, allowing time to take action and avoid damage. And, Phyn's Plumbing Check feature can detect a range of hidden flaws like poor seals and pinhole leaks in a home's water system.

The *Phyn Smart Water Assistant* works seamlessly with Amazon *Alexa* and *Google Assistant*. And with IFTTT, users can have Phyn trigger actions with other smart home devices.

For more information: WWW.PHYN.COM



StreamLabs Control Valve

The new ultrasonic *StreamLabs Control* valve allows monitoring of water use, checking for leaks and turning water off with a smartphone. The device is truly "smart" in that it can learn water use patterns and tip users off to abnormalities, such as excessive flow, or too-high or low pressure, humidity or water temperature. There's also a downloadable drip alert app, *Drip Detect*, which can be checked daily, weekly or monthly. And, it has Home and Away modes to ensure household protection whenever needed.

StreamLabs Control is compatible with *iPhone*, *iPad* and *Android* phones and tablets, and it integrates with *Google Nest* and *Amazon Alexa* for smarthome-style monitoring. API access is available upon request.

The unit's compact size makes it less-obtrusive than competing products. Installation is fairly simple; owners pretty much need to know how to cut the piping. A caveat: The unit is rated only for indoor use or within a weather-proof enclosure. StreamLabs hopes to have an outdoor-compatible unit on the market soon.

For more information: WWW.STREAMLABSWATER.COM/CONTROL

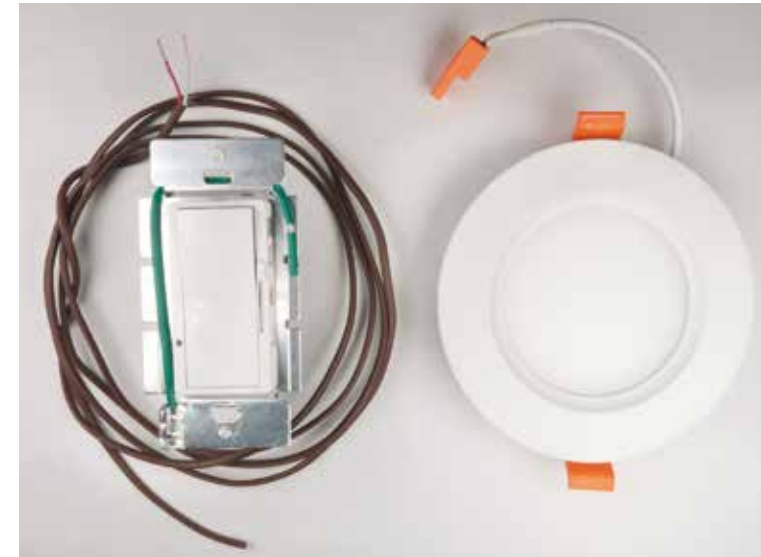
► Viega Automatic Recirculation Balancing Valve

Viega's *Automatic Recirculation Balancing Valve* is a modification of a product that has been used successfully in Europe for years. It helps keep water temperatures more uniform by adjusting flow with changes in temperature. The results are faster hot water delivery, minimized waste energy and water and less stagnation and chance of contamination.

Convenience is a key element with the *Automatic Recirculation Balancing Valve*. Unlike with manual valves, temperature can be set once and be maintained automatically. Settings can be changed easily, if needed. The valve can be installed on risers or branches. Remote monitoring includes a temperature sensor, and an optional thermometer provides a visual indication of the valve setting. And, there is a bypass that allows for thermal disinfection. Additional accessories that can be used with the valve include a drain valve and optional insulation sleeve.

Meanwhile, this valve requires minimal work on the part of designers, engineers, installers and building maintenance personnel. And, threaded ends allow it to be used with Viega *ProPress* or *Viega PureFlow* fittings systems.

For more information: WWW.VIEGA.US



◀ ATX-LED Lighting System

LED lighting is a standard in housing now, but it is by no means perfect. ATX-LED offers a more-efficient, affordable and smarter alternative using DC power instead of the traditional 120 volt AC.

Every standard LED bulb has a converter that changes the incoming AC into low-voltage DC for the LEDs to operate. This tends to be a failure point; when these bulbs are placed into a ceiling fixture, the AC to DC converter heats to more than 140 degrees Fahrenheit. This leads to early failures of the bulb. ATX-LED DC lighting, which runs at 48V, prevents the heat buildup, which helps the bulb achieve closer to its expected 10-year lifespan.

ATX's LED lights can be operated with a dimmer; every ATX-LED dimmer is smart and be controlled via voice or mobile app. Lighting schedules can be set. Meanwhile, ATX-LED's wafer LED lighting is a half-inch thin and mounts directly into the ceiling sitting flush—no need for any metal "cans" in the ceiling. And, 48V DC requires 18-gauge, two-wire copper security wire, down from three 12-gauge for 120V AC. That's less copper, less waste.

For more information: WWW.W.ATX-LED.COM

LIGHT FIXTURES, CONTROLS AND SENSORS

► Carrier TruVu Multi-Purpose HVAC Control Platform

For those with a large investment in HVAC units—such as owners of apartment buildings or senior living complexes—Carrier's *TruVu* multi-purpose control (MPC) platform can make life a lot easier. *TruVu* can control multiple pieces of HVAC equipment simultaneously, making it ideal for rooftop units and air handlers.

TruVu includes a comprehensive library of factory-engineered control programs. These programs have been designed and tested to work with both air-side and water-side HVAC systems—without the need for custom programming, saving engineers valuable time. In the event that customization is needed, Carrier's SNAP graphical

programming tool can modify the library control programs or create new ones from scratch.

Other features include support for up to nine I/O expansion modules in a compact configuration or remotely mounted up to 1,000 feet away; access to Carrier's communicating sensors for sensing environmental conditions such as temperature, humidity and CO₂ in a building; and built-in diagnostic tools to help operators troubleshoot BACnet network communications as well as capture BACnet traffic.

For more information: WWW.CARRIER.COM



► EcoSmart SmartBoost Water Heater Booster

When it comes to showering, the biggest concerns are how long it will take to get hot water and how long it will last. EcoSmart's *SmartBoost*, which connects directly to the water tank's hot water outlet, enables homeowners to increase the efficiency and performance of their existing gas or electric water heater by 45 percent. This gives it the power of a much larger tank without the installation and renovation costs.

SmartBoost also delivers eco-friendly benefits by activating only when the tank can't keep up with the hot water demanded. When paired with an electric tank, *SmartBoost* helps save energy and money while homeowners are away through an eco mode and a vacation mode.

Other cosmetic elements include advanced, self-modulating technology, which adjusts energy needs based on how much warm water is needed; a digital display showing outlet temperature, which can be adjusted in single-degree increments; durable heating elements that are threaded for easy replacement; and compact size maximizes valuable storage space. And, homeowners can use their existing electric tank wiring to connect *SmartBoost*. EcoSmart provides straight forward installation instructions that a savvy do-it-yourselfer can follow.

For more information: WWW.ECOSMARTUS.COM



◀ Lennox iComfort S30 Ultra Smart Thermostat

Lennox is known for its line of smart thermostats, has grown exponentially with its *iComfort* series. The *iComfort S30 Ultra Smart Thermostat* offers homeowners technological assets in the way they heat their home and keep their household air clean.

Mother Nature is a big part of the smart thermostat's appeal. The *iComfort S30* offers seven-day weather forecasts and air quality conditions for the homeowner's local area, so they always know what's going on outside. The thermostat has a "Feels Like" temperature, similar to a weather report, which takes into account indoor and outdoor temperature and humidity to make the home feel exactly like the homeowner wants. *S30* also monitors air quality and pollen levels in a homeowner's ZIP code and automatically turns the fan on to clean the home's air when outdoor levels are high.

The *iComfort S30* is compatible with Amazon Alexa. Compatibility with Apple *HomeKit* allows thermostat control via Siri on a smartphone, and it can be paired with an *iPad*, *Apple TV* or *Apple HomePod*. In addition, the "Smart Away" mode works with a smartphone app to detect when the homeowner leaves and returns to the home, automatically adjusting the system to an energy-saving mode.

For more information: WWW.LENNOX.COM

► 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 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.

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.

For more information: AMICOGLOBAL.COM/HYDRODRY-SYSTEM



ROOFING, SIDING AND DECKING



◀ Centennial Woods Reclaimed Wood Planking

Millions of feet of wooden snow fencing are replaced each year, much of which ends up in the landfill or simply being burned—a pair of environmentally unfriendly options. Wyoming-based Centennial Woods puts the discarded boards back to use as residential siding, decking and wall paneling as part of its reclaimed wood service.

Milled from deconstructed 12-foot-high snow fences, Centennial's product is naturally aged—some of the boards are 10 years old, and they've spent that decade in high-altitude air—which them perfect for accent walls, ceilings and do-it-yourself projects. These weathered wooden boards present a range of gray and brown tones in their natural state. Knots, knot holes, nail holes and imperfections are an expected part of this wood's charm.

The boards are also clean: They have never been exposed to lead paint, barnyard animal waste or other toxins. They're certified GREENGUARD Gold for healthier indoor air quality, and they're definitely carbon negative. And, they're available when needed: Centennial Woods ships its products internationally and domestically to contractors and consumers by the box, pallet, truckload or shipping container.

For more information: CENTENNIALWOODS.COM

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◀ LP SmartSide ExpertFinish Trim & Siding

LP Building Solutions continues to expand its portfolio of durable siding products with LP® SmartSide® ExpertFinish™ Trim & Siding, a prefinished siding option available in an array of tailored colors. The prefinished coloring eliminates the painting phase of the construction process, saving time, labor costs, and time needed to dispose of toxic paint.

SmartSide ExpertFinish also includes LP's new ExpertFinish Lap to avoid the need for seam caulking, joint molds or pan flashing at butt joints. It is available in 16 versatile colors, and a variety of SKUs and finishes to complement a multitude of exterior style and design needs. The product utilizes engineered wood strand technology that offers superior protection against hail, wind, moisture, fungal decay and termites.

Like all LP SmartSide siding products, LP SmartSide ExpertFinish Trim & Siding also provides advanced durability, which can lead to less jobsite waste and easier installation. It also comes with a leading 5-year labor, 15-year finish and 50-year substrate warranty.

For more information: LPCORP.COM

▶ Polyglass Velociflex High-Wind Roof Assembly System

Storm-tolerant roofing does not get the job done on its own. Polyglass U.S.A. fills that gap with its Velociflex high-wind roof assembly system. Velociflex provides for high speed wind protection of up to 270 pounds per square foot.

The core of Velociflex is two or three plies of reinforced modified bitumen membranes. Suitable for new or reroofing projects, this multi-ply system comprises of a mechanically fastened base sheet, optional interply, and a heat-welded or cold-applied cap sheet. Velociflex is ideal for both steel and concrete decks.

The self-venting Velociflex system's "loose-laid," mechanically attached base sheet reduces the likelihood of blistering from substrate to membrane. Attached at the seams only, it also limits material and labor costs. Plus, the watertight system acts as a temporary roof once base sheet seams are heat-welded. Fast and efficient to install, the Velociflex system dries in fast, so projects can proceed with phased construction before cap sheet installation.

Velociflex complies with 2016 Title 24 Part 6 Cool Roof Requirements and is ENERGY STAR® Certified. The system is also compatible with a variety of SBS and APP cap sheets from Polyglass, including Elastoflex, Polyflex, and Elastoshield membranes.

For more information: WWW.POLYGLASS.US



◀ Broan-Nutone Line Voltage Doorbell

When it comes to using a doorbell, things can't be much simpler: push a button. Installing one is another matter, but Broan-Nutone has found a way to simplify that. The company's new Line Voltage Doorbell's kit has a built-in transformer and a wireless, battery-free kinetic pushbutton for quick, easy installation.

That gives homeowners a choice of the traditional wired line—which goes directly to line voltage to save installation time—or the kinetic wireless, which requires no batteries or power lines running outside the house. This is a huge timesaver for installers. And it's a great convenience for the homeowner.

Each variety of Line Voltage has other unique features. The wired doorbell can also be paired with two other doors using the kinetic version. The wireless unit has eight different tones to select from, while the wired unit offers distinct front and back tones. And, the wired unit's buttons include long-lasting LED bulbs, ensuring that house guests are never left in the dark.

For more information: WWW.BROAN-NUTONE.COM

▼ 1Valet Customizable Smart Building Ecosystem

For builders and developers, constructing a luxury multi-residential dwelling has long meant constructing a building that includes a number of traditional mundane amenities, and wrapping it with high-end interior finishes. Today's most desirable multi-family developments are innovative, smartphone-centric buildings that connect residents and empower them to control every aspect of their living experience.

1VALET takes otherwise independent building components and management tasks and combines them into one intuitive, user-friendly building management solution. The platform acts as the operating system of the building, simplifying



management operations for new builds or retrofits.

Interactive and sleek touchscreen consoles replace conventional phone-booth-style intercom dialing in lobbies and vestibules. Smartphone video calling and access logs inform users of

who is attempting to enter the building, while facial recognition, virtual keys and PIN codes provide keyless community access for residents, guests and staff.

The system's Property Management Portal allows building managers to access and manage any property remotely through an HD camera network dashboard. They can easily manage resident, guest or vendor access privileges, dispatch elevators to any floor, manage all vital building systems, and receive emergency alerts. Even tenant turnover becomes a digital process through one-click door rekeying and resident information removal.

For more information: WWW.1VALET.COM

SMART AND CONNECTED TECH



▲ Lockly Secure Smart Lock

Lockly creates smart security solutions that can be installed onto any door, and provides users with maximum security and convenience. That means heading into high-tech territory with Lockly Secure, a smart lock with amenities such as 3D biometric fingerprint sensors, smartphone-enabled locks and security-enhanced digital displays.

Access codes are a big part of Lockly's success. A mobile app quickly locks and unlocks doors and easily creates access codes for family, friends and property tenants. Lockly Secure Pro technology also includes sensors that always monitor door status, and status checks status using the mobile app or voice via Amazon Alexa and Google Home.

All Lockly smart locks are equipped with the company's award-winning, patented PIN Genie software that provides an extra layer of security by scrambling the numbers on the digital display so that they are not stationary and located in the same spot every time. Lockly Secure is also the only smart lock able to generate multiple access codes without an internet connection. This feature is extremely useful for quickly sending remote access codes to any Lockly Secure location without having to rely on Wi-Fi—perfect for multiple home and office locations.

For more information: WWW.LOCKLY.COM

► CalPlant Rice Straw Fiberboard

For all of medium-density fiberboard (MDF)'s properties, the ones that are least attractive are the formaldehyde-based resins that kill the sinuses. CalPlant offers a non-smelly, durable and very green version made from rice straw.

The converted material is a boon to the environment—rice straw is an agricultural waste with no practical value. California, the nation's second-largest rice producer, has banned its burning, forcing farmers to flood their fields to speed the decomp process. This wastes thousands of gallons of water and release tons of methane into the air.

CalPlant's MDF performs similar, and in some cases better than, traditional wood fiber-based product in terms of durability and moisture resistance. It's ideal for interior installs, such the cross bands in plied composite panels, laminate flooring, doors, and carved molding and trims. Instead of urea formaldehyde, the rice straw fiber is held together with polymeric methylene-diphenyl-diisocyanate (pMDI), a green building and State-sanctioned adhesive resin common in the composite panel industry.

Currently CalPlant crafts its product using only California-based rice straw, but the process could be expanded to other locales in the near future.

For more information: WWW.CALPLANT1.COM



STRUCTURAL SYSTEMS AND LANDSCAPING

◀ CETCO ULTRASEAL AB Waterproofing Membrane

Incorporating a new pressure-sensitive adhesive layer, the enhanced *ULTRASEAL® AB* waterproofing membrane bonds tenaciously to concrete to prevent water migration. *ULTRASEAL AB* waterproofing membrane bonds once concrete is poured against its membrane surface. Unlike other adhesive-bonding membranes, its Active Polymer Core (APC) waterproofing layer self-seals small punctures and tears commonly caused during construction activities. The product's adhesive layer protects the polymers from moisture during construction, which enables it to be installed in all weather conditions and both hydrostatic and non-hydrostatic conditions.

ULTRASEAL AB waterproofing membrane is designed primarily for under slab and property line foundation shoring wall construction, including soldier pile and lagging, metal sheet piling, auger cast caisson, shotcrete, and stabilized earth retention walls. It can be used in backfilled conditions as well.

ULTRASEAL rolls are lightweight and easy to handle, with exceptional flexibility for maximum conformability when fitting to a structure. It can be installed directly to green concrete and placed as soon as forms are removed—no need to wait for the concrete to cure—and can be installed without primers or adhesives, even in extreme temperatures.

For more information: WWW.CETCO.COM



► Georgia-Pacific DensDefy Membrane

Water intrusion during construction can cost a fortune in rework-related expenses and time. To counter this, Georgia-Pacific unveils *DensDefy™ Liquid Flashing*, a flexible liquid-flashing membrane that seals and protects against water intrusion for transitions between substrates at rough openings, penetrations, joints, sheathing fasteners and seams, and unwanted air movement.

DensDefy Liquid Flashing is highly durable and eliminates the need for joint reinforcing tape, reducing overall preparation time. It's ideal for gaps of more than 1 inch wide and for transitions between different materials. The product is fast cure—even under moist conditions—and may be applied in low temperatures and high elongations. It can tolerate rain immediately after application, without 12-month exposure to normal weather conditions, and is easy to install without primer.

Liquid Flashing works in conjunction with the *DensDefy Transition Membrane*, a flexible, self-adhering membrane used to maintain continuity of the above-grade water-resistant barrier and air barrier at complicated transition areas. The robust adhesive bonds easily to most building substrates.

For more information: WWW.DENSDEFY.COM



◀ LP WeatherLogic Water Screen

LP Building Solutions' *WeatherLogic® Water Screen* can maximize a project's moisture retention protection to help extend the life of exterior surfaces via increased ventilation and drainage. It provides an added layer of protection to mold growth to help improve performance of housewrap or WRB sheathing. It's also lightweight and easy to install.

The *Water Screen* is available as a synthetic polymer-based screen that can be used with OSB and a WRB housewrap, or in conjunction with an integrated panel, such as the LP *WeatherLogic Air & Water Barrier*. Installs like regular sheathing for potential labor savings while keeping jobsites cleaner and more professional.

The product works well with all other LP structural products. It also comes with a 25-year warranty. The *Water Barrier* is part of the LP Structural Solutions portfolio, which the company notes has a single goal: helping the industry work toward better, more resilient homes to help stand up to whatever nature can throw at it.

For more information: WWW.LPCORP.COM



HONORABLE MENTION



▲ Carlisle Tranquil Collection Flooring

The *Tranquil Collection* from Carlisle Wide Plank Floors meets the growing demand for smooth face flooring in a low matte, layered finish. The *Tranquil Collection* utilizes a UV-cured oil that doesn't require specialty cleaning products or frequent reapplications of finish. Carlisle's prefinished wood flooring has no measurable VOCs, and no urea formaldehyde is added during the manufacturing of the company's engineered wood flooring. In fact, Carlisle's engineered wood floors exceed the CARB2 compliance guideline for formaldehyde emissions. Most of Carlisle's timber is sourced and company floors are crafted in the U.S., significantly reducing the environmental footprint.

For more information:
WWW.WIDEPLANKFLOORING.COM

▼ Daltile RevoTile

RevoTile from Daltile is a porcelain tile floating floor system for residential and multi-family projects that installs twice as fast than



traditional tile, saving builders time and money. There is no mortar drying time, no messy two-part grout—a definite plus for durability and appearance, given how grout often cracks or becomes moldy—and no return visits. And, the product is easily installed by any member of a builder's team, expanding the available pool of installers. The product is offered in 26 different marble, wood, stone and concrete looks.

For more information: WWW.DAL TILE.COM/REVOTILE



▲ Ecore Origins Flooring

A green alternative to carpet, Ecore's *Origins* flooring combines cork and vulcanized composition rubber to produce a beautiful and sustainable floor covering option. The cork used in this product is from a cork tree's bark, which provides the benefits of wood without harming the tree. *Origins* is more durable, slip resistant and offers better acoustic properties than traditional resilient flooring. It draws its inspiration from nature, featuring high-intensity, deep, saturated and pure colors that are near solids. *Origins'* 12-by-24-inch tiles can be installed in an offset or herringbone pattern for endless design options.

For more information: BIT.LY/2ILPYNB

▼ GoContractor Safety Compliance Platform

GoContractor's self-named product tackles the No. 1 priority of every construction business: safety. The online orientation platform enables companies to ensure that their employees comply with safety regulations. The internet-



based tool also means less time in classrooms and a more-comfortable learning environment for electricians, plumbers, contractors, subcontractors and others. And, GoContractor eliminates hours of on-site orientation, providing advance training via smartphone, tablet or computer, freeing up time for the important stuff—like getting the job done.

For more information: GOCONTRACTOR.COM



▲ Kolbe Windows VistaLuxe Collection AL Line

Unlike traditional aluminum windows, which are infamous for making the house colder instead of keeping heat in, Kolbe Windows & Doors *VistaLuxe® Collection AL Line* takes a break—a thermal break. The product is a selection of thermally broken, all-aluminum windows that stay warm and therefore don't pull heat out of a room. They're stylish, too, available in several classic colors and two Reynaer's handle styles: *Purity*, which are environmentally friendly, non-corrosive, hypoallergenic and 100 percent recyclable, and *Touch*, with an integrated spring system that enables them to return to their original position.

For more information:
WWW.KOLBEWINDOWS.COM

◀ Kolbe Windows Forgent Series

New construction or replacement projects with short lead times can benefit from a strong, stylish window that can be quickly installed. Kolbe Windows' *Forgent Series* is a high-performance product line constructed of Glastra®—a proprietary hybrid of fiberglass and UV-stable polymer formulated for strength and resilience.

The advanced ladder design adds strength, while promoting long-term durability and energy efficiency for comfortable homes. An integral nailing fin and welded sash and frame provide rigidity—keeping units square, and preventing air and water from entering the joint. It also requires fewer sealing points and is more-rigid than a traditional fin.

A glazing bead receptor helps create a clean breakpoint during painting and staining. An accessory groove allows for quick installation of exterior accessories without additional clips. And, dry-glazed sash allows for serviceable sash and components.

Adapting to the market's aesthetic and performance demands, *Forgent Series* windows and doors are engineered with Glastra on the exterior, and a choice of wood or Glastra on the interior, both with popular select finishes. The windows' energy efficiency and durability also lead to fewer callbacks, which saves time and money, and keeps customers happy.

For more information: WWW.KOLBEWINDOWS.COM/FORGENT



▲ Marvin Skycove Alcove

If a home's footprint seems too small, window maker Marvin has a way to easily add a few more square feet per room. The *Skycove* is a fully constructed, immersive low-e3 glass alcove that extends the functional living space within a home by up to 20 square feet.

Sightlines of less than 3 inches, including vertical posts, create a seamless connection to the outdoors and more light than traditional rough openings. The cantilevered structure provides unique, elevated vantage points and the top glass opens the view to the sky above. The unit can handle more weight than the average outdoor deck—roughly 60 pounds per square foot vs. 50 pounds—without additional structural support.

The depth of the seat is half the width of a queen-sized bed and the largest-sized unit is 8.5 feet long, easily large enough for two but cozy enough for one.

An aluminum interior provides a clean aesthetic with elemental material, and its seating bench can be finished to suit any design style. *Skycove* comes with an insulated seat base with a color-matched aluminum soffit system so no additional exterior finishing work is needed.

For more information: WWW.MARVIN.COM

WINDOWS AND DOORS

▼ Sierra Pacific Westchester Double Hung Window

When working with history, go with a history maker. The *Westchester Double Hung Window* by Sierra Pacific Windows offers structural and thermal performance ratings that are rarely found in double-hung windows. The new line also features the narrowest check-

rail sightline for high end windows, along with historically accurate sash proportions. This makes the product beneficial for historic homes—which have a strict set of preservation criteria—and modern homes that owners simply want to immerse with the latest and greatest.

With a performance rating of PG50 on most standard sizes, the *Westchester* line has 0.28 U-value with dual insulated Lo-E 366 and argon, and a triple insulated glass U-value of 0.17. The windows feature a thermally broken sash construction, integral aluminum nail fin, a constant force balances standard, and optional Class 5 Hybrid Spiral Balance for sash of up to 140 pounds.

The heavy duty doors, suitable for residential or commercial use, feature extra-thick 0.055-inch extruded aluminum cladding for a low-maintenance exterior. They are surface protected by Sierra Pacific's exclusive *CoreGuard Plus™* wood protection product. And,

the company's concealed jambliner is a real upgrade to a natural, all-wood interior free from unsightly vinyl.

For more information: SIERRAPACIFICWINDOWS.COM

▼ Lennox EL296V Two-Stage Gas Furnace

While most gas furnaces have only two options—on and off—Lennox offers the EL296V, which can create heat at two different levels. This allows it to find a smart balance



between energy use and comfortable warmth. A variable-speed motor constantly adjusts airflow speed and gently disperses even heat throughout the home, efficiently delivering exceptional comfort.

Because it can fine-tune airflow to match demand, the motor minimizes wasted electricity. With a 96 percent efficiency rating, the EL296V can potentially save a homeowner hundreds of dollars per year in energy costs.

For more information: WWW.LENNOX.COM/RESIDENTIAL



▲ Mitsubishi Electric BEAM AX Energy Management System

Supplying power to an apartment building or business office isn't cheap. But Mitsubishi Electric's BEAM AX™ energy management system can make it easier to handle. The cloud-based tool collects and analyzes facility data in a sleek interface accessible via desktop, tablet and smartphone. The system can analyze energy use, set budget goals, track performance, forecast peak demand up to five days in advance, detect usage abnormalities, and compare alternative tariffs for potential

cost savings. BEAM AX also offers energy advisory services, including utility tariff coaching, return-on-investment (ROI) project analysis, and prioritization of energy conservation and cost savings opportunities.

For more information: WWW.BEAMAX.IO/#/HOME



▲ Panasonic ECONAVI Sensor

Panasonic's ECONAVI technology features infrared sensors that detect occupancy and activity fluctuations in a given space. This enables efficient, automatic heating and cooling operation to match room conditions and occupancy levels. The sensors automatically adjust to cool off a packed, hot room or lower cooling power to save energy when no one's around. Operating costs are reduced without sacrificing occupant comfort or convenience. Available for use in an entire home or individual rooms, homeowners can customize room temperature depending on which areas they use the most.

For more information: BIT.LY/2U6KB34

▼ Quick Mount PV QRail Tilt Roof Mounting System

Solar roof mounting and racking systems manufacturer Quick Mount PV's QRail™ Tilt mounting system makes it possible for solar install on low-slope residential and commercial



roof buildings, and buildings with structural load restraints. The system can be installed at a 5- or 10-degree tilt, with a large assortment of height options. QRail Tilt also enables installation over roof obstructions and prevents the roof degradation that occurs with a ballasted system. And, the system makes it easier to access a roof for maintenance or repair after an array has been installed.

For more information: BIT.LY/3AVAKUL



▲ Weil-McLain Stainless Vertical Firetube Boiler

Weil-McLain Stainless Vertical Firetube (SVF) line of natural gas and propane boilers features a stainless-steel vertical fire tube and shell heat exchanger for best-in-class corrosion resistance, a new, bold exterior look, and user-friendly controls to make installation and operation easy. The unit also is zero clearance, side-by-side installation capable to help make the most out of confined boiler room floor space. The SVF also is ideal for hybrid applications calling for a cast iron boiler complement. Each unit has ultra-low emissions, and has Commercial Energy Star Certification.

For more information: BIT.LY/2ITXAJD

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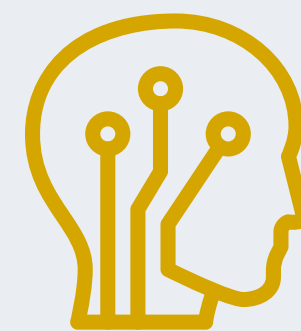


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GREEN BUILDER[®] BRAND INDEX | 2020

What do green professionals perceive as the most sustainable building products and brands?

BY GREEN BUILDER STAFF

This year, we've taken a deeper look at brand loyalty. You may be familiar with our annual *Readers' Choice* survey, which has provided many years of valuable insight on what people like and don't like about products in the green construction market. Our first annual *Green Builder Brand Index* offers an even more-complete picture of what's on consumers' minds.

Results in three distinct categories—our traditional survey data, public sentiment and market visibility or “mentions”—are averaged to derive a company's final ranking among its peers.

As a result, a few big-name players don't even make the top five within their category, while other, lesser-known companies hit the brand heights for the first time. This shows where a company is doing well, and which improvements could round out category excellence.

See full results of the Green Builder Brand Index at www.greenbuildermedia.com//2020-readers-choice-and-brand-index.

KEY:

FINAL BRAND INDEX SCORES WERE DETERMINED BY WEIGHTED AVERAGES OF THE FOLLOWING THREE MEASURES:

- Survey Data:** How our readers ranked each company's sustainability compared with other companies on our list.
- Sentiment:** Ranking in terms of how favorably consumers see the company compared with the other companies on our list.
- Mentions:** Ranking in terms of number of positive mentions compared with how the other companies scored.

NOTES: If a number appears to be missing (or two brands get a “7” score, for instance), it's because two of the top 10 brands tied. In some categories, we collected data for more than 10 brands. Only the top 10 overall scores are listed for each product category.

Appliances



Bosch

OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Bosch	1.5	2	1	6
2	GE	2.5	3	3	2
3	LG	3.6	4	3	3
4	Whirlpool	3.7	1	9	4
5	Electrolux	5.8	6	5	7
6	Viking	6.6	7	5	9
7	SubZero/Wolf	6.8	9	1	11
7	Samsung	6.8	5	11	5
9	Miele	8.0	7	10	8
10	Dacor	9.4	10	8	10

Happy times. Brand recognition and loyalty continue to be huge factors in the Appliance category. That was certainly the case with Bosch, which rode rocket-level rankings for Survey Data and Public Sentiment straight to the top. Last year's No. 1, GE, received very favorable marks all around. Samsung, meanwhile—last year's No. 3—lost ground in the sentiment arena, according to our results.

Building Wrap



Huber

OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Huber “Zip System”	4.0	3	7	5
2	Owens Corning “PinkWrap”	4.1	2	2	9
3	DuPont Tyvek “HomeWrap”	4.3	1	4	11
4	Dow “Weathermate”	4.4	4	5	5
5	GP “Forcefield”	6.0	8	9	1
6	Fortifiber “WeatherSmart”	6.9	4	9	12
7	CertainTeed	7.0	8	1	7
8	Kingspan (FORMERLY PACTIV)	7.5	10	3	4
9	Benjamin Obdyke “HydroGap”	7.8	11	9	1
10	Typar “HouseWrap”	8.0	7	8	10

Wrapped up. Solid responses in all three categories gave Huber Engineered Woods the top spot this year, although not by much. The overall top four in the brand survey were the ones survey takers identified with the most. But some, especially last year's No. 1, DuPont Tyvek—with a lead at least four times that of any other competitors—need to make a stronger impression on the public.

OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	IKEA	1.3	1	4	1
2	KraftMaid	2.8	2	7	3
3	Merillat	3.8	3	8	4
4	American Woodmark Cabinetry (FORMERLY TIMBERLAKE)	4.2	5	6	2
5	ACPI (FORMERLY ADVANTA CABINETS AND ECHELON CABINETRY)	5.2	4	1	9
6	MasterBrand	5.4	6	3	5
7	Wood-Mode	6.9	7	9	6
8	Wellborn	7.3	8	1	8
9	Columbia Forest Products (FORMERLY NEIL KELLY)	8.6	10	5	7
10	Executive Cabinets	9.4	9	10	10

Holding firm. Even with our new, more complex data analysis, the same brands emerge as dominant this year. The same top five from 2019 are the top five in our new Brand Index Survey. That includes IKEA and KraftMaid as the overall leaders. Everyone in that top five except ACPI could stand to polish their image a bit, but that's nit-picking.

OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Corian	2.1	1	6	3
2	Eco by Cosentino	2.2	3	7	1
3	Caesarstone	3.3	2	9	2
4	Cambria	4.6	5	4	4
5	Formica	6.0	6	9	5
6	IceStone	6.8	6	2	10
6	PaperStone	6.8	4	11	11
8	WilsonArt	7.4	8	8	6
9	Vetrazzo	8.2	9	1	9
10	Neolith	8.6	10	2	8
10	Zodiaq	8.6	10	5	7

Counter point. Corian takes the lead this year, but like the second- and third-place winners, they are not the most “talked about” brands, simply among the most mentioned, and well respected by building pros. Vetrazzo and Neolith, well down in the finalist lineup, actually turned out to be the public favorites, pulling them into the top 10 for the first time.

Cabinet and Shelving



IKEA

Countertops



Corian

Decking



Trex

OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Trex	1.9	1	10	1
2	CertainTeed EverNew	2.6	2	2	4
3	Cali Bamboo	3.2	2	5	5
4	TimberTech	3.7	4	7	2
5	MoistureShield	6.2	5	8	8
6	Viance	6.4	5	4	10
7	Green Bay Decking	7.5	7	12	7
8	Tamko	8.1	10	3	6
9	Fiberon	8.4	11	9	3
10	TruGrain	9.3	8	8	13

Repeat champion. For the fourth straight year, Trex has clear dominance in the Decking category, ranking first in survey response and word of mouth. But the longtime category champion may want to up its game among the public—its Sentiment ranking was not as positive as its competitors. In contrast, Kleer, which didn't make our finalist top 10, was the crowd favorite at No. 1 in Sentiment.

Flooring



Armstrong

OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Armstrong	2.1	1	6	3
2	Mohawk	2.2	2	4	2
3	Shaw	3.4	4	7	1
4	Cali Bamboo	4.8	3	9	7
5	Crossville Tile	5.8	5	1	9
6	Forbo	5.9	7	2	5
7	Tiles of Italy	7.4	5	11	11
8	Interface	7.6	9	10	4
9	Lauzon	8.2	8	4	10
10	Milliken	8.6	10	2	8

Fine flooring. The top four brands, in similar position to last year, continue to demonstrate a strong reputation for sustainability. All of the brands made last year's list too, with one exception—Mullican—which stumbled a bit and was swapped out by Milliken this year.

Hot Water System



Rheem

OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Rheem	1.6	1	7	1
2	Bosch	2.9	2	8	3
3	A.O. Smith	3.6	4	6	2
4	Rinnai	3.7	3	4	5
5	Bradford White	4.5	5	3	4
6	Navien	6.3	6	9	6
7	Takagi	6.5	7	2	7
8	Stiebel Eltron	7.1	7	5	8
9	Noritz	8.2	9	1	9

Full steam ahead. Rheem and Bosch continue to duke it out for supremacy in Hot Water Systems, with the two swapping spots at the top for the third straight year. Rheem's taken a substantial lead, however, when it comes what people think of and how they talk about the brand. Noritz has very strong positive public sentiment, but the company needs to make its case to building professionals, and up its online presence.

HVAC



Trane

OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Trane	2.7	1	9	4
2	Carrier	3.5	3	11	2
3	Lennox	3.5	2	8	5
4	Mitsubishi Electric	5.0	6	5	3
5	Rheem	6.0	5	9	7
6	Bosch	6.7	4	13	10
7	ClimateMaster	7.1	6	2	11
8	LG	7.7	8	5	8
8	York	7.7	10	14	1
10	Daikin (and Goodman)	8.3	9	11	6

Cooling off. The usual leaders in this category were in the top 10 again, thanks to strong survey responses from building pros, but many are not leading the popularity curve with the public. Bosch, in particular, took a hit, falling out of the top three. Strong positive public opinion isn't everything, of course. The crowd favorite, Weil McLain (not shown, but No. 1 in the Sentiment category), finished near the bottom of the survey overall.

Insulation



OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Dow	3.9	3	9	4
2	BASF	4.3	6	1	2
3	Owens Corning	4.4	1	8	10
4	Rockwool	5.3	3	11	8
5	Insulfoam	5.8	7	7	3
6	CertainTeed	6.4	5	1	11
6	GreenFiber	6.4	2	13	13
8	Johns Manville	7.6	9	1	7
9	Icynene-Lapolla	9.0	12	6	4
10	Accella Performance Corp <small>(FORMERLY BAYSEAL/CARLISLE)</small>	9.1	12	10	6

Household names. Owens Corning’s lost their usual spot as the top insulation brand—once all three types of data were weighted and averaged—but not due to lack of brand recognition, and not among building pros. People have heard of the classic company; they’re just not talking about it much. Chart leader Dow, on the other hand, did well in both those categories but suffered with public sentiment. No insulation brand scored well across all three categories, meaning there’s ample room for shifting brand loyalties.

Lighting



OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Philips	2.2	1	7	3
2	Sylvania	3.2	2	5	5
3	Eaton Lighting <small>(INCL. HALO)</small>	3.3	4	6	1
4	GE Lighting	3.7	3	1	6
5	Progress Lighting <small>(HUBBELL)</small>	5.8	7	4	4
6	Acuity <small>(FORMERLY JUNO)</small>	6.3	8	9	2
7	Kichler	6.5	6	8	7
8	CREE	6.7	5	10	9
9	Generation Lighting <small>(FORMERLY SEAGULL)</small>	7.9	9	1	8
10	Savoy House	8.5	9	1	10

Still the ones. Most of this list remains unchanged from the 2019 Readers’ Choice survey. The all-around favorites make up the top four, but a little bit of PR could make contenders out of the middle of the pack. Watch out for the list’s newcomers, though—Acuity/Juno, Generation Lighting/Seagull, and Savoy House—all of which have caught the public’s eye.

Paint and Coating

OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Sherwin-Williams	1	1	1	1
2	Benjamin Moore	3.3	3	3	4
2	Valspar	3.3	2	6	5
4	Behr	3.4	4	4	2
5	PPG	4.5	5	6	3
6	Glidden	5.9	6	5	6
7	Kelly Moore	7.1	8	2	7
8	Dunn Edwards	7.4	7	8	8

King of the hill. Sherwin-Williams pulled off the seemingly impossible feat: a sweep of the top score in every category, making it the undisputed No. 1 among paint providers. Having an environmentally friendly campaign—“Cover the Earth”—doesn’t hurt. Not that runner-up Benjamin Moore has much to complain about, other than being ranked second-best behind Sherwin-Williams for the past six years in our Readers’ Choice survey.



Plumbing

OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Kohler	1.8	1	6	2
2	Moen	2.2	2	7	1
3	Delta	3.1	3	4	3
4	TOTO	5.3	4	2	9
5	American Standard	5.9	5	8	7
6	Grohe	6.3	7	3	6
7	Hansgrohe	6.4	8	1	5
8	Niagara	7.5	6	9	10
9	Gerber	7.7	10	5	4
10	Pfister	8.2	8	10	8

Deep loyalties. Every company on this list made last year’s Readers’ Choice top 10, and, except for a couple positional swaps, continue to dominate the category. Kohler and Moen, in our view, lead because of frequent introduction of new products and innovations.



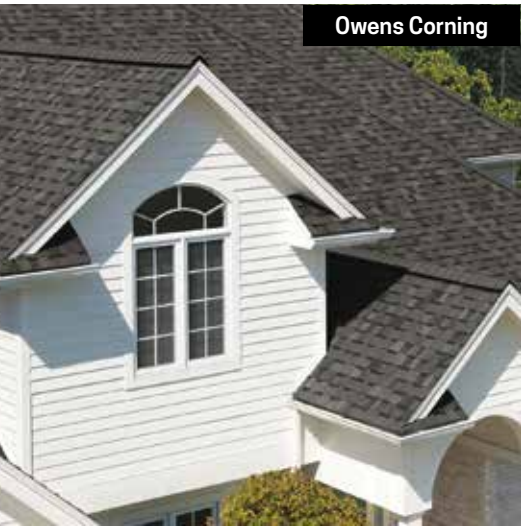
PV



OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	SunPower	1.9	2	1	2
2	Tesla/Solar City	1.9	1	10	1
3	LG	3.5	3	2	5
4	Panasonic	4.4	4	2	6
5	Jinko	5.5	5	4	7
6	Sharp	5.9	7	8	3
7	Vivint	6.3	7	9	4
8	CertainTeed	7.3	6	7	10
9	Hanwha Q Cells	8.3	9	5	8
10	NRG	8.7	9	6	9

Holding steady. After three years at the top of our Readers’ Choice survey, a tumultuous, controversy-filled 2018 knocked Tesla subsidiary Solar City out of the top spot and a footstep behind SunPower. We’re happy to see our friends at Jinko making a strong showing on the chart, catching up with some of the biggest players in the U.S. photovoltaic market.

Roofing



OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Owens Corning	2.5	2	7	2
2	GAF	3.7	4	10	1
3	CertainTeed	3.9	3	12	3
4	EcoStar	4.7	1	5	12
5	Boral Roofing	6.7	6	1	10
5	Atlas Roofing	6.7	7	3	4
5	DaVinci	6.7	7	7	6
8	Custom-Bilt Metals	8.1	9	6	7
9	EnviroShake	8.2	5	7	15
10	TAMKO	9.5	11	14	5

Top side. A tale of two contenders: Last year’s co-titlist, Owens Corning (per Readers’ Choice), maintained its place as a go-to pick for roofing, but fellow 2019 champion EcoStar slipped a few spots due to lack of public comment. The same can be said for EnviroShake, last in Mentions but in the top one-third in public response.

OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Amazon	1.7	1	8	1
2	Google	2.3	2	2	3
3	Samsung Smart Things	3.1	4	1	2
4	Apple	3.6	3	6	4
5	Control4	5.4	5	3	7
6	Honeywell	6.4	7	4	6
7	Leviton	6.6	6	6	8
8	Belkin	6.8	8	5	5

Tech turnaround. Amazon leads the smart home brand pack overall when it comes to Smart Home Technology, but the interesting detail here is Samsung’s high ranks in both Sentiment and Mentions. The company is regaining the public’s trust rapidly, following a bumpy release of “Smart Things” a couple of years ago. They’re poised to lead this sector, if “Things” continue to go well.

Smart Home



Smart Switch



OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Samsung	1.4	1	5	1
2	Lutron	2.3	2	2	3
3	Leviton	3.5	3	2	5
4	TP-Link	4.6	6	4	2
5	iDevices	4.9	4	7	6
6	Brilliant	5.5	5	1	8
7	Etekcitcity	6.3	6	6	7
8	WeMo	6.8	8	8	4

No switching here. Samsung, Lutron and Leviton continue to hold the top three slots, as they did in last year’s Readers’ Choice, and by a good margin over the rest of the pack. With the exception of Brilliant, a newcomer to the party, the role of “follow the leader” continues for another year for No. 4 and beyond.

Siding



OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	James Hardie (FIBER CEMENT)	1.4	1	5	1
2	BASF (EIFS)	2.4	2	6	2
3	CertainTeed “Cedarboards”	4.2	4	9	3
4	Allura	4.3	5	1	4
5	LP “Smartside”	5.2	3	10	8
6	Eldorado Stone (MANUFACTURED STONE)	5.8	5	1	9
7	Dryvit	7.0	9	1	5
8	Ply Gem	8.3	9	8	7
9	Boral (BRICK AND MANUFACTURED STONE)	8.6	7	11	11
9	MaxiTile	8.6	7	11	11

Fiber-cement and beyond. Veteran James Hardie still sits at the top, gaining the best survey response and greatest word of mouth, and fairly well thought of by the public. But there’s no clear leader when accounting for all three categories, so the category is not “locked down.”

Structural



OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Premiere Building Systems (SIPS)	2.5	2	1	4
2	Boise Cascade (EWP)	3.8	1	11	7
3	Logix (ICF)	4.6	5	1	5
4	Weyerhaeuser- Trus Joist	4.9	2	10	9
5	Fox Blocks	7.2	10	9	1
6	Simpson Strong Tie	7.3	7	1	10
7	BuildBlock	7.5	4	12	13
8	GP (EWP)	8.0	9	8	6
9	LP (EWP)	8.2	7	16	8
10	NUDURA (ICF)	8.5	12	7	2

Changing fortunes. Boise Cascade’s engineered wood business dropped out of the Readers’ Choice top spot it earned in 2019. In the Structural System category of the Index, Premiere Building Systems, a maker of SIPs, hit all the right notes. Perhaps alternative structural systems have finally hit their brand stride.

Solar Components

OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	SolarEdge	2.5	1	10	3
2	Tesla	2.7	2	12	1
3	Daimler Mercedes-Benz	4.3	3	7	6
4	Delta Electronics	5.3	3	11	8
5	Sonnen	6.1	5	4	9
6	OutBack Power	6.2	5	2	10
7	Tabuchi Electric	6.4	5	1	11
8	Schneider Electric	6.6	8	3	5
9	Enphase	6.9	9	9	2
10	SMA	8.4	11	6	4

Unique is in. After pulling ahead in the 2019 Readers’ Choice survey—largely because of its sophisticated solar offerings—SolarEdge has seen the market tighten dramatically, with Tesla now only a couple of happy customers away from grabbing the No. 1 spot. The difference was marketing, which was top-notch for both but a hair better for Elon Musk’s venture. The rest of the pack remains in pursuit, waiting for a branding breakthrough, or some stumbling at the top.



OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Rheem	1.2	1	3	1
2	SunEarth	2.3	2	5	2
3	SunMaxx Solar	3.4	3	1	5
4	Steibel Eltron	3.5	4	2	3
5	Apricus	4.6	5	4	4
6	AET Solar	6.0	6	6	6

Greener suns. Rheem and SunEarth continue their battle for dominance in the Solar Thermal category, with the two trading places from 2019. Among the other categories, little seems to have changed in terms of brand strength.



Thermostats



OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Nest	2.2	1	7	3
2	Honeywell	2.3	2	5	2
3	Ecobee	2.5	3	4	1
4	Bosch	4.2	4	6	4
5	Schneider-Electric	5.4	6	3	5
6	Carrier	6.0	5	9	7
7	Lux	6.8	7	8	6
8	Sensi	7.0	7	1	9
9	Vine	7.9	9	1	8

Nest squeaks by. What was once a runaway is now a three-player race at the top. Nest, which last year in our Readers’ Choice survey had as much market share as the next five competitors combined—when measured against our weighted Index—finds itself only slightly ahead of Honeywell and Ecobee. The latter’s name recognition tripled once Amazon threw marketing weight behind it.

Ventilation



OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Panasonic	1.6	1	4	2
2	Delta Breez	2.7	2	6	3
3	Fantech (SYSTEMAIR)	3.3	3	3	4
4	Broan NuTone	3.5	5	2	1
5	Air King	4.4	4	5	5
6	S&P	5.8	6	1	7
7	Aprilaire	6.0	6	6	6

Quiet strength. Panasonic continues its reign at the top of the Ventilation category, perhaps in part because news of the upcoming release of its Cosmos system has caught the public imagination. The company also has a strong online e-commerce presence. Delta Breez holds its ground from last year’s survey as a healthy, popular runner-up. Fantech has some solid numbers across the board and might be a company to watch in 2020.

Windows and Doors



OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Andersen	2.9	1	14	3
2	Pella	3.6	2	18	2
3	Milgard	4.3	6	4	1
4	Therma-Tru	4.5	3	6	7
5	Jeld-Wen	4.7	3	11	6
6	Marvin	7.0	7	13	5
7	Masonite	7.7	10	5	4
8	Weather Shield	8.5	5	16	13
9	Kolbe	9.4	8	10	12
10	Euroline Windows	10	8	1	17

Pros vs End Users. For list leaders Andersen and Pella, building pros and customers seem to see the brands through very different lenses. Why does the public have so little positive to say about either brand? Are they simply so familiar that they don’t need to discuss quality? We’d have to dig through the data more to know for sure—more than this overview allows. On the other hand, there’s Euroline Windows, which is little-known among building pros, but is well thought of by the public.

Work Vehicle



OVERALL RANK	COMPANY	RANKING			
		INDEX AVG	SURVEY DATA	SENTIMENT	MENTIONS
1	Ford	2.1	2	6	1
2	Toyota	2.2	1	1	5
3	Chevy	2.9	3	5	2
4	Nissan	4.3	4	1	6
5	Mercedes-Benz	5.2	6	7	3
5	Dodge RAM	5.2	5	1	7
7	GMC	5.8	7	4	4

Domestic interest. When all three scores are weighted in the Index, Ford ends Toyota’s two-year run atop the Work Vehicle category, compared with last year’s Readers’ Choice survey. One brand that could learn from this data is GMC. The company has lackluster support from building pros and isn’t getting the kind of online traction that could make up for that brand weakness.

READERS' CHOICE 2020

GREEN BUILDER®

Industry Stalwarts

BY SARA GUTTERMAN, CEO

Since 2013, we've been asking our primary magazine audience—builders, architects, appraisers, kitchen designers and trades—to rank which brands they most associate with sustainability. While our new Brand Index (also in this issue) includes this scoring, we wanted to pull out three top brands that, year after year, win both hearts and minds of our highly selective Readers' Choice Brand Survey. These are the “go-to” companies our readers trust to do the right thing in terms of product performance, durability, clean manufacturing and environmental stewardship.



READERS' CHOICE 2020
APPLIANCES

Winner:
Whirlpool

From super-efficient induction cooking ranges to a vast line of energy-efficient refrigeration and water-saving laundry units, Whirlpool has earned its place in the hearts of professionals, exceeding the expectations of end users. New products include striking innovations, including digital tools that make dryers smarter, cut water use even more for dishwashers, and “inject” detergent into clothes washers. Smart tech from a smart company.



READERS' CHOICE 2020
BUILDING WRAP

Winner:
DuPont Tyvek

Decades of painstaking research and a regular cadence of innovation keep DuPont's line of wraps, flashings, and sealing products on the short list for progressive building firms. Other companies in this arena have their niches, but it's rare to see a new neighborhood where Tyvek is not the dominant “work-in-progress” feature.



READERS' CHOICE 2020
INSULATION

Winner:
Owens Corning

Homeowners don't always consider the building science advantages of using the right insulation, in the right space, installed the right way. But building professionals do. They know that Owens Corning shares their passion for building tighter, more sustainable homes, and will help them optimize every project's energy performance.

Field Test: Ventilating an ADU for Optimal Air Quality

By combining an “always on” ERV and quiet bath fan, this installation achieved above-and-beyond air quality.

BY MATT POWER

ONE OF THE CHALLENGES WITH SMALL “mother-in-law” apartments and accessory dwelling units (ADUs) is that they’re often built without adequate ventilation, or they have unbalanced systems that create drafts or fail to clear the air, or worse, haul other pollutants back into the building.

For example, most range hoods operate at 300 cfm or higher only. When you switch on a range hood in a building with the footprint of a garage, you can quickly depressurize the space, pulling air in indiscriminately from unwanted sources (such as the garage, in the case of an apartment over parking).

While upgrading the ceilings in a small accessory structure in Florida, we saw an opportunity to test one of the new ceiling insert Energy Recovery Ventilators (model *FV-VE401*) from Panasonic in conjunction with an exhaust-only bath fan (model *FV 0511VKSL2*), as a whole-house air quality solution. With a total square footage under 400, it would also meet the definitions of a tiny house, by most standards, and the same size approximation would apply to a park model RV.

We had three goals in mind with the test:

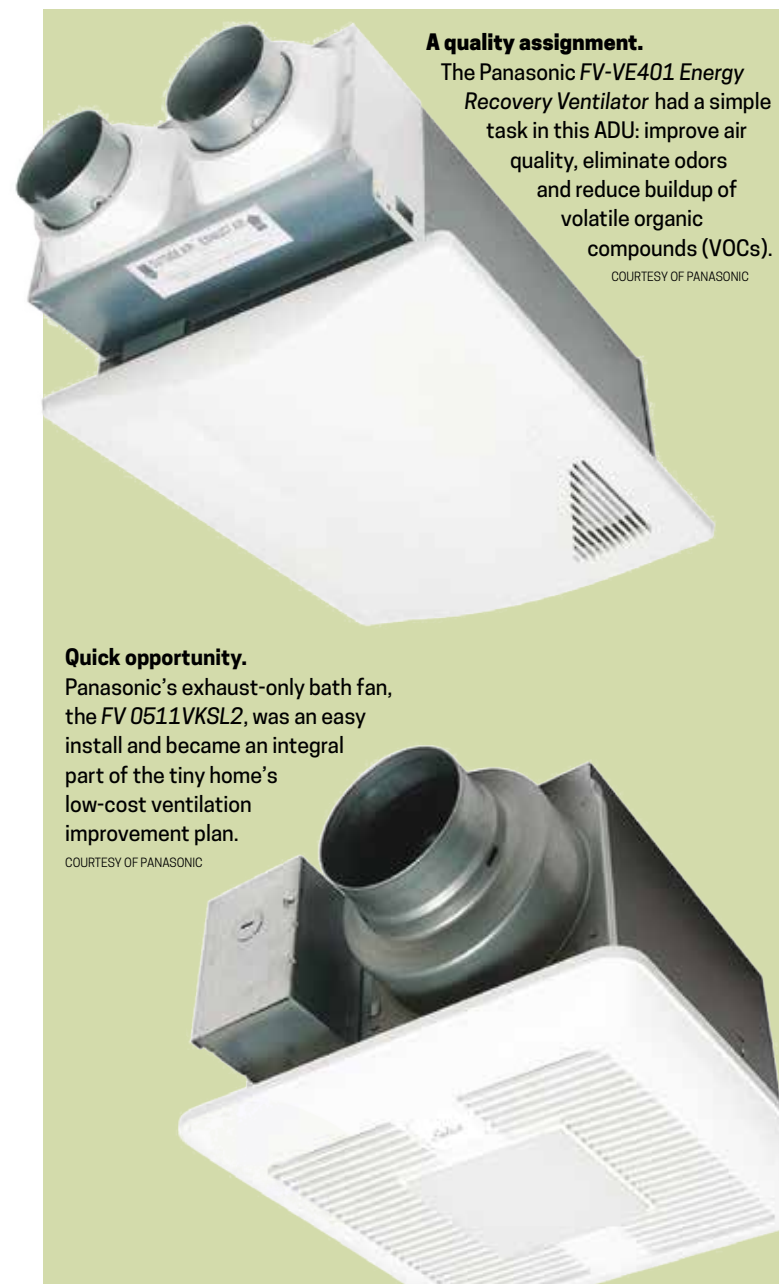
- Meet the minimal ventilation standards (ASHRAE 62.2) at low energy cost.
- Remove unpleasant odors from the house on demand.
- Reduce buildup of volatile organic compounds (VOCs) and odors from building materials and behavior.

Installing the Units

Panasonic has spent years simplifying installation of its equipment and making them about as close to turnkey as you can get.

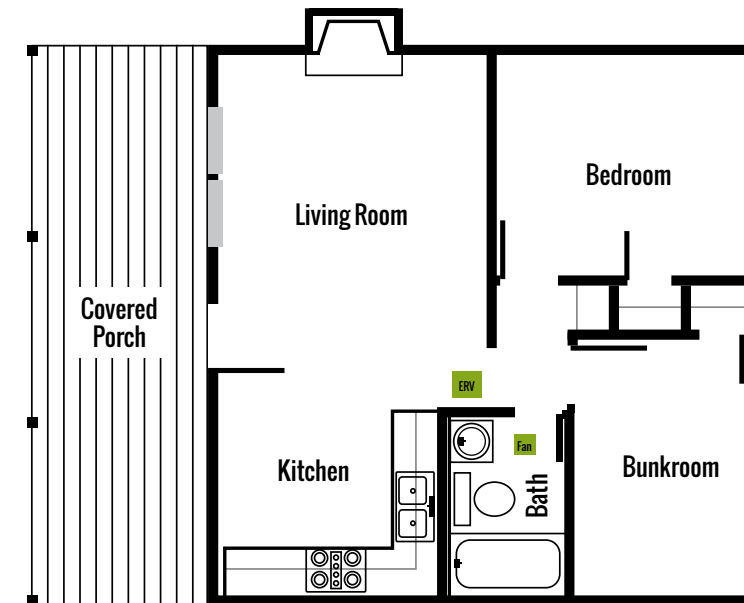
The bath fan took only about 15 minutes to set and install. The ERV took a little longer, because it’s a larger, heavier unit—and the rafter distance was not 16 OC. To secure it, we had to build out some 2-by-4 framework.

One of the more helpful details the company includes as part of the ERV carriage is a built-in measuring gauge that allows you to set the depth of the unit, depending on your ceiling type. We set ours



A quality assignment.
The Panasonic FV-VE401 Energy Recovery Ventilator had a simple task in this ADU: improve air quality, eliminate odors and reduce buildup of volatile organic compounds (VOCs).
COURTESY OF PANASONIC

Quick opportunity.
Panasonic’s exhaust-only bath fan, the FV 0511VKSL2, was an easy install and became an integral part of the tiny home’s low-cost ventilation improvement plan.
COURTESY OF PANASONIC



Fresh air. In a small ADU layout such as this, a small ceiling-mount ERV combined with bath fan keeps air quality high. PLAN SOURCE: WIKIHOW

at the far extreme of that depth, to accommodate ¾-inch strapping and another half inch for a galvanized metal ceiling. The ERV does not come with an integral light, so we dropped a separate box in for a surface-mounted LED light a few inches from the ERV. The bath fan has its own built-in LED that is plenty bright for the separate toilet room.

Wiring was straightforward. We opted for default, lower energy setting for full-time operation of the ERV.

For ducting, Panasonic recommends insulated ducting for the *FV-VE401*, but assumes that air will pass through unconditioned spaces. Because our ducts would pass through partially conditioned space above the bath, we used a less-expensive type of ducting (still a step up from standard rigid four-inch ducts), *AC Infinity Flexible 4-Inch Aluminum Ducting*. It’s made with four layers.

This product seems to perform well for this purpose, does not leak, and was much less expensive than insulated four-inch duct.

Exhaust Locations and Vent Caps: Takeaway

Because two units—an ERV and a toilet room fan—would be placed at the same end of the building, we had to pay careful attention to placement of the exhaust ducts. Panasonic specifies a six-foot distance between the ERV intake and any combustion appliances.

We applied the same rule of thumb, separating the bath fan exhaust from the ERV fresh air intake by about seven feet to avoid recirculating odors.

We also learned one of the pitfalls of using a third-party vent cap instead of Panasonic’s proprietary combination wall cap for the ERV. We instead put in some stainless steel vent caps with “gravity flaps” for the ERV and bath fan exhausts, thinking they would hold up better than PVC to Florida’s extreme heat and UV.

What we didn’t foresee is rattling. Because the Panasonic bath fan and ERV operate at a low speeds, the metal louvers rattled constantly. We ultimately replaced them with vinyl ones with mosquito mesh and no moving parts. The two ultra-quiet DC-powered

fans in the *Intelli-Balance* ERV operate almost inaudibly, and the bath fan is only slightly louder. When we first installed the ERV, and set it for constant operation at a low speed. It was so quiet that we had to hold a piece of paper over the exhaust to make sure it was working.

Airflow in an Unvented Assembly

We chose the bath end of the structure rather than the kitchen area, assuming that the exhaust-only range hood would “pull” clean air from the ERV down the length of the building. To assist in this flow, we left rafter areas above the ceilings open to living spaces, below roofs insulated with three-inch rigid foam. We added a ceiling fan near the center of the building to keep air moving.

One challenge with unvented structure of any size is the buildup of pollutants and humidity. Our aim was for the ERV to solve these challenges. The addition of solvents, paints, epoxies and even cedar boards had added a powerful stew of odors and VOCs to the tight structure. We were not sure the ERV would have enough capacity to “clear the air.”

We were pleased to find that our concerns were unfounded. We activated the unit on a Friday and by Monday, when we reentered the building, most of the odors were gone. Rather than trust our noses, however, we installed IAQ sensor to test for pollutants over a 24-hour period. What we found was very encouraging. Air quality levels throughout the 400-square-foot building remained well within the optimal range, with only a minimal spike occasionally after cooking. I attribute this to a less-than-perfect range hood, not the ventilation system.

The Right Mix

When we initially talked to Panasonic staff about ventilation for the ADU, they suggested two exhaust-only units in the bath area.

But as we explained the challenges of a small space and the risk of depressurization, they agreed that the ERV was a smarter choice. It should be noted that ERVs are not intended to replace bath ventilation. They’re not designed to remove heavy humidity from showering, for example. But our open floor plan allows enough dispersion of humidity for the spot ERV to handle the occasional humidity spike.

After two months of operation, the electric bill for the ADU has seen negligible increase, despite 24/7 operation of the ERV.

This field test coincides with Panasonic’s recent development of a new “smart” suite of ventilating products called *Cosmos Healthy Home System*, which incorporates an IAQ sensor and Wi-Fi hub to monitor and balance air quality in the home. Our installed system is not Cosmos-enabled, but does demonstrate the quiet and efficient engineering that will be part of that advanced system.

Cosmos will also incorporate the company’s new ventilating range hood, the *WhisperHood* IAQ range hood, said to operate at noise level far below that of most competitors. **GB**

For more information on the products reviewed here, click on the links below:

- [WhisperComfort™ ERV Balanced Air Solution](#)
- [WhisperGreen® Select™ Fan/Light, 50-80-110 CFM, Multi-Speed](#)
- [WhisperHood IAQ Range Hood](#)

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impact the safety, durability, performance, and financial worth of their homes.



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SMART CITIES

Environmental Insurgence

Here are three exciting technological developments coming for green builders out of the San Francisco Bay Area.

BY TERRY BEAUBOIS

LED BY THE GREEN BUILDING MOVEMENT, many advances and improvements are coming in the near future. These will the design and construction of homes and buildings that will significantly improve the built environment for all. Here are three technologies to consider in your green building projects.

1. NEW HOME CONNECTIVITY

One of the most important developments underway is the announcement of “Project Connected Home over IP.” This effort is to “develop and promote the adoption of a new, standard to increase compatibility among smart home products, with security as a fundamental design tenet.”



COURTESY OF SPANIO

The companies that are working together to create and promote in this standard include Amazon, Apple, Google and the Zigbee Alliance. The Zigbee Alliance includes IKEA, Samsung SmartThings, Philips Lighting (now Signify), Legrand, NXP Semiconductors, Resideo, Schneider Electric, Silicon Labs, Somfy and Wulian.

The New Home Connectivity concept is that by building upon the popular and widespread Internet Protocol (IP) standard, this project will enable communication across a wider variety of smart home devices, mobile apps and cloud services. The project will “make it easier for device manufacturers to build devices that are compatible with smart home and voice services,” such as:

- Amazon Alexa
- Apple's Siri
- Google Assistant
- Any others that join in

Introducing this new standard will facilitate the integration of Smart Home elements during the planning, design and construction phases, rather than only applying them as add-ons after construction. This new standard will also increase the choice of products for a project and reduce dealing with a combination of incompatible devices. This will also allow homeowners a wider range of possible devices to be integrated into their home projects.

Progress will be reported on the Project Connected Home over IP website at www.connectedhomeip.com.

2. THE NEW HOME ELECTRICAL PANEL

Briefly mentioned in a previous article, I had the opportunity to visit the SPAN.io San Francisco headquarters and see the SPAN electrical panel in person. SPAN promises to deliver a new level of energy automation in the home.

The SPAN panel provides all the safety features of a standard home electrical panel but with added functionality. It also has been designed with the aesthetics of a product or device for the modern home.

The concept includes the home electrical panel becoming the center for connected power in your home. It can be controlled from a convenient smartphone app that allows the homeowner to access information about energy usage and control the panel remotely.

Installation of the SPAN panel is the same as installing a traditional electrical panel and can be done by any certified electrician, using most-standard breakers. SPAN is designed to function as a regular electrical panel, and more easily accommodates connection to solar

panels and a battery storage unit. The configuration with battery storage and solar panels would be able to supplement a typical electrical utility company supply as well as function independently during any utility company blackout, should one occur. In areas subject to natural disasters including flooding, wildfires, hurricanes or earthquakes, this will be a capability of particular interest.

The SPAN app also makes it easy to optimize power usage by letting you categorize and prioritize the energy use in your home.

SPAN.io recently worked with installers in Hawaii and is currently working with homeowners and installers in California. The company's official website is www.span.io



Power pack. The SPAN accessory package includes a storage battery, electric meter lights, fan and controller app.

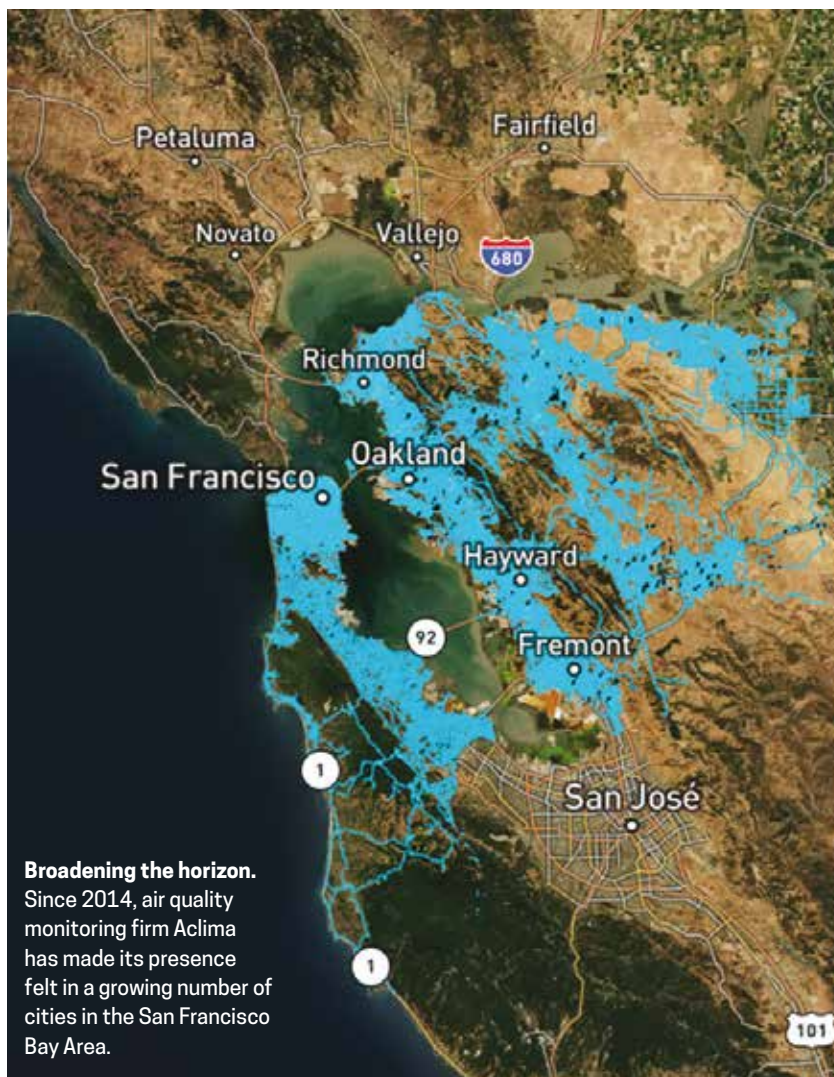
3. AIR QUALITY DATA – STREET-BY-STREET INFORMATION

Aclima is a company currently undertaking air quality measurements and the mapping of air pollutants and greenhouse gases, block-by-block, in the nine counties of the San Francisco Bay Area—more than 5,000 square miles. The company currently has a fleet of cars mapping every street in Santa Clara County.

Aclima's overall goal is to protect human health and the environment. It has partnered with the Bay Area Air Quality Management District to raise awareness and work toward ensuring that Bay Area residents breathe clean air. The company also wants to bring an unprecedented level of visibility to air pollution and climate change emissions to the region. Aclima will make its air quality information available, including address-based insights accessible to the public online.

In September 2019, the Aclima team took steps to make its local data available to air quality regulators and the public in San Diego. Aclima's efforts in the San Francisco and San Diego areas serve as examples of what collaboration between citizens, government and the private sector can do to address air pollution across California and around the globe.

The public meetings in San Diego involved small groups where everyone had an opportunity to ask questions and brainstorm ideas for future versions of the online application. They focused on ways



Broadening the horizon. Since 2014, air quality monitoring firm Aclima has made its presence felt in a growing number of cities in the San Francisco Bay Area.

COURTESY OF ACLIMA

the application can amplify existing air quality improvement efforts underway in the community, and how the app can be made even more powerful for the public's use and understanding. The online tool includes access to information provided by the San Diego County Pollution Control District.

Aclima is headquartered in San Francisco. Its website is www.aclima.io

NEXT ISSUE: ROBOTS IN CONSTRUCTION

The robots are coming! In my next article for the May-June issue of *Green Builder*, I'll be reporting on my visit to a robotics company to see a demonstration of its first construction robot, as well as other companies that are developing autonomous vehicles for civil engineering work for site construction. **GB**

Terry Beaubois is the CEO of Building Knowledge Systems, LLC, in Palo Alto, Calif. He is involved in research projects, articles, speaking engagement, and guest lecturing in university classes related to the building industry, with a specialty in advancing technologies and green building.

CODE ARENA

The Latest Rules, Regulations and Codes Impacting Sustainable Construction

Energy Efficiency Advocates: Win the Battle But Lose the War?

BY MIKE COLLIGNON

THE INTERNATIONAL ENERGY CONSERVATION CODE (IECC) went through its triennial revision process during the course of 2019. When the dust settled, **energy efficiency advocates** felt the 2021 IECC made significant efficiency gains, especially compared to the 2015 and 2018 editions. Online vote totals were not available as of press time, but voter turnout was tilted towards the sustainability constituency unlike anything the code arena has ever seen.

The outcome of the final vote was so overwhelming, and in some instances the exact opposite of earlier voting rounds, that it has **others questioning** the online voting process. Will the 2021 IECC become synonymous with the 2012 International Residential Code (IRC), where fire officials voted en masse to adopt fire sprinkler requirements, only to have local and state builder associations lobby them out of nearly every jurisdictional code? If the 2021 IECC is not adopted at the state and local level, how will the anticipated efficiency gains ever be realized?

This will be the first in a series of articles on the 2021 IECC. This entry features a table showing the voting outcomes at different stages of the code development process, as well as a view into where the two most influential stakeholders stood on a variety of common proposals.

While the table on page 60 reflects proposals that were featured in the two main voting guides, there were other outcomes that deserve a mention:

RE126 – This proposal calls for reduced water heating energy use by requiring more-efficient water heating systems. RE126's passage is of note, because it a) was unanimously disapproved by the committee, b) the final outcome can't be "blamed" on the energy efficiency community's voting guide, since it wasn't included, and c) will most likely be challenged due to scope. That'll be a difficult challenge, since the International Code Council (ICC) Board already ruled that domestic hot water (and water efficiency) falls under the purview of the IECC. Also of note: The proposal's author filed a public comment, seeking to modify the original proposal. That was also disapproved by the public comment hearing voters, so the online voters approved the original proposal.

RE132 (PARTS 1 AND 2) – These proposals require mechanical ventilation in all dwellings. Depending on the ACH50 of the home (sub 5), this was already a de facto requirement for respectable indoor air quality. The proposals were modified by the committee, then passed



To be continued. The 2021 International Energy Conservation Code (IECC) makes huge strides over its 2008 and 2015 predecessors, but State and local officials could veto any efforts.

8-3 and 8-1, respectively. NAHB is claiming that these proposals should have been considered under the International Mechanical Code (IMC) and/or IRC, so this might be another situation where we see a scope challenge. However, both the public comment hearing voters and the online voters upheld the committee's decision, so this will be politically difficult for ICC to reverse the vote of their own members.

RE162 – The consent agenda is for proposals that are approved by the code development committee, and receive no public comments. This is one of those proposals, because it made sense to all involved. It earned a **unanimous vote of approval** from the committee, and is now in the model energy code. It gives credit to hot water distribution system design that shortens the run from the water heater to wet rooms. This, in turn, reduces energy devoted to heating water *and* structural (water) waste. Credit to Gary Klein for this very logical code change.

RE166 – Like RE126, this was a proposal about water and falls under the purview of the IECC. However, it was unanimously *approved* by the committee, and was approved at the public comment hearing. Unfortunately, it was in the bullseye of the energy efficiency community, with its inclusion in their voting guide, *and* the subject of a public comment requesting disapproval. Apparently, the online voters agreed, much to the dismay of water efficiency advocates.

CE217 (PART 2) – This proposal was known as the EV-ready proposal. It included a table that prescribed, based on the total number of parking spaces, how many EV-ready and EV-capable spaces were needed. For lots with 26 or more spaces, two EV-ready spaces would

KEY:	D - Disapprove	Approve
	AS - As submitted	Disapprove
	AM - As modified	
	AMPC - As modified by public comment #	
	PCH - Public Comment Hearing	
	NAHB - National Association of Home Builders	
	EE - Energy Efficiency groups	

RE7 - Increases lighting efficiency; updates definition of high efficacy

Committee: AS 11-0	PCH: AMPC 1	Online result: AMPC 1
NAHB: AS, AMPC 1 or 2		EE: AMPC 1

RE29 - Modifies wall insulation and U-factor requirements in climate zones 4-5

Committee: D 8-3	PCH: D	Online result: AS
NAHB: D		EE: AS

RE32 - Increases slab insulation requirements in climate zones 3-5

Committee: D 7-4	PCH: D	Online result: AS
NAHB: D		EE: AS

RE33 - Increases ceiling insulation requirements in climate zones 2-3

Committee: D 9-2	PCH: D	Online result: AS
NAHB: D		EE: AS

RE36 - Increases ceiling insulation requirements in climate zones 4-8

Committee: D 11-0	PCH: D	Online result: AS
NAHB: D		EE: AS

RE37 - Adds solar heat gain coefficient requirement in climate zone 5

Committee: D 8-3	PCH: D	Online result: AS
NAHB: D		EE: AS

RE40 - Allows R-18 wall insulation (w/ advanced framing) instead of R-20 in climate zones 3-8

Committee: AS 6-5	PCH: D	Online result: D
NAHB: AS		EE: D

RE59 - Separates prescriptive and mandatory basement wall insulation requirements

Committee: AM 9-2	PCH: AM	Online result: AM
NAHB: AM		EE: AM

RE60 - Separates prescriptive and mandatory slab-on-grade floor insulation requirements

Committee: D 6-5	PCH: AMPC 2	Online result: AMPC 2
NAHB: D		EE: AMPC 2

RE95 - Introduces sampling protocol for air leakage testing in multifamily structures

Committee: D 7-4	PCH: D	Online result: D
NAHB: AS		EE: D

RE102 - Allows air leakage testing for multifamily structures per ASTM E779 (single zone, multiple zones or individual units)

Committee: AS 6-5	PCH: D	Online result: D
NAHB: AS		EE: D

RE112 - Adds leakage testing requirement for ducts within thermal envelope; allows total leakage of ≤ 8.0 cfm/sq.ft.

Committee: AS 6-5	PCH: AS	Online result: AS
NAHB: D		EE: AS

RE117 - Mandates duct leakage requirements, regardless of location of air handler or duct work

Committee: D 6-5	PCH: D	Online result: D
NAHB: D		EE: D

RE119 - Allows duct leakage testing to the outside as an acceptable test method

Committee: D 7-4	PCH: D	Online result: D
NAHB: AS		EE: D

RE121 - Adds duct leakage test sampling options for R2 multifamily dwelling units

Committee: D 6-5	PCH: D	Online result: D
NAHB: AS		EE: D

RE130 - Requires mechanical ventilation systems to be tested; allows 3rd party verification

Committee: AS 6-5	PCH: AS	Online result: AS
NAHB: D		EE: AS

RE145 - Requires all lighting to be high efficacy; re-defines high efficacy as ≥ 70 lumens/watt; requires all permanently installed lighting to have occupant sensor controls

Committee: D 11-0	PCH: D	Online result: AS
NAHB: D		EE: AS

RE147 - Requires electrical circuits & receptacles to be installed near gas or propane appliances

Committee: D 9-2	PCH: D	Online result: AS
NAHB: D		EE: AS

RE148 - Requires multifamily buildings to comply with exterior lighting requirements of commercial code.

Committee: D 7-4	PCH: AMPC 1 & 2	Online result: AMPC 1 & 2
NAHB: D		EE: AMPC 1 & 2

RE151 - Establishes 2009 IECC envelope requirements as a backstop in the performance path.

Committee: D 11-0	PCH: D	Online result: AS
NAHB: D		EE: AS

RE156 - Allows onsite renewable energy to be used as a credit for efficiency

Committee: D 7-4	PCH: D	Online result: D
NAHB: AS		EE: D

RE157 - Deletes batch sampling language for stacked multi-family units

Committee: D 7-4	PCH: AS	Online result: AS
NAHB: D		EE: AS

RE165 - Creates small penalty for duct systems located inside the air barrier & thermal envelope if air leakage to the outside is not tested.

Committee: AM 10-1	PCH: AM	Online result: D
NAHB: AS		EE: D

RE171 - Establishes a standard reference assumption for thermal distribution system efficiency, regardless of testing or the type of system

Committee: D 6-5	PCH: D	Online result: D
NAHB: AS, AMPC 1		EE: D

RE176 - Resurrects the 2006 IECC equipment efficiency trade off in the performance path

Committee: D 6-5	PCH: D	Online result: D
NAHB: AS		EE: D

RE182 - Changes envelope backstop for ERI (w/ on-site renewables) compliance to 2018 IECC

Committee: D 9-2	PCH: D	Online result: AS
NAHB: D		EE: AS

RE184 - Limits amount of total energy use reduction from onsite renewable to 5% in ERI path

Committee: D 11-0	PCH: D	Online result: AS
NAHB: D		EE: AS

RE190 - Removes envelope backstop for ERI (w/ on-site renewables) compliance; lowers ERI scores to 2015 IECC values

Committee: D 11-0	PCH: D	Online result: D
NAHB: D		EE: D

RE192 - Lowers ERI scores to 2015 IECC values

Committee: D 10-1	PCH: D	Online result: AS
NAHB: D		EE: AS

RE196 - Allows a 15% tradeoff on the envelope backstop for ERI (w/ on-site renewables) compliance

Committee: D 7-4	PCH: D	Online result: D
NAHB: D		EE: D

RE204 - Requires homes using the ERI (w/ on-site renewables) compliance path to prove the renewable energy credits are owned or conveyed to the homeowner

Committee: D 11-0	PCH: D	Online result: AS
NAHB: D		EE: AS

RE206 - Introduces “Flex Points” table; requires 5 points for prescriptive path, 5% additional efficiency for performance and ERI path

Committee: D 8-3	PCH: D	Online result: D
NAHB: D		EE: AS

RE207 - Introduces “Flex Points” table; requires 10 points for prescriptive path, 10% additional efficiency for performance and ERI path

Committee: D 11-0	PCH: D	Online result: D
NAHB: D		EE: AS

RE208 - Introduces a “Points” framework; requires 3 points or 3% additional efficiency for prescriptive and performance path; allows equipment efficiency tradeoffs

Committee: D 7-4	PCH: D	Online result: D
NAHB: AS		EE: D

RE209 - Introduces 5 additional mandatory compliance packages (each equals 5% additional efficiency; user chooses 1) applicable to all compliance paths

Committee: D 6-5	PCH: D	Online result: AS
NAHB: D		EE: AS

RE210 - Introduces glide path to zero (by 2042) in the ERI (w/ renewables) compliance path, 40 (by 2033) in the ERI (w/o renewables) compliance path

Committee: D 11-0	PCH: D	Online result: D
NAHB: D		EE: D

RE223 - Adds Net Zero Energy appendix for jurisdictions to utilize if they so choose

Committee: D 6-5	PCH: AMPC 2	Online result: AMPC 2
NAHB: D		EE: AMPC 2

be required, and 20 percent of the total spaces would need to be EV-capable. **The proposal** also defined EV-ready and EV-capable. This proposal, while in the commercial energy code, would also apply to one- and two-family dwellings. It clearly expands the scope of the IECC to include energy devoted to vehicles. The committee disapproved it 8-3. Public comment voters disapproved it. NAHB and the International Association of Building Officials wanted it disapproved. However, the energy efficiency community’s voting guide sought its passage, so the online voters adopted it. It will be interesting to see what ICC decides on this clear scope challenge.

To read through the residential committee’s comments and vote totals (by proposal), please visit <https://bit.ly/2UujKOp> or [click here](#). To review the results of all Group B code change proposals, please visit <https://bit.ly/39asb73> or [click here](#). As of press time, the online vote totals were not available from ICC.

AUTHOR'S COMMENTARY:

To the casual observer, the one-sided nature of the 2021 IECC voting result was probably surprising. However, that is taking a way-too-shallow look at this very nuanced topic. When considering the bigger picture, the real shocker in what transpired is how swiftly it happened.

If you, the reader, have been paying even nominal attention to various entries in this space over the last 1-2 years, you know there is a growing movement towards increasing renewable energy portfolios (despite what Ohio does), net-zero energy and net-zero carbon emissions. The time horizons vary, from 2030 to 2040 to 2050. But they’re still on the books, and people are working towards those goals as you read this.

This is a movement backed by governors, legislatures, mayors and city councils. It’s supported by hard-working professionals on jobsites every day. The directives for a more sustainable built environment have already been given in numerous locales. Incremental 1 percent to 2 percent gains every three years isn’t going to accomplish those policy goals. The 2021 IECC vote was clearly a manifestation of those directives.

The real question is: What happens now? Will the 2021 IECC get adopted, implemented and enforced? Has the voting process been manipulated in such a way that it sours the overall code development process? Will ICC be pressured into changing voter qualifications? The result of the vote sent a clear message, but the ripple effects are just starting to be felt. **GB**

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

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

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FROM THE TAILGATE

New Offerings for the Sustainable Minded

By Ron Jones

The Finer Selling Qualities of Quality of Life

THE EARLY 2020 TRADE SHOW CYCLE is well behind us now. Everybody seems to have moved on to thinking about the upcoming quarters of this year and even the 2021 calendar. But, I want to comment and share some takeaways from those recent experiences.

I always like to poke a little at the edges of the comfort zones of the people representing the various products, systems and services in the building industry, and the sustainability sector in particular. So, while cruising around and engaging in conversations at the two big shows in January—CES followed by Design & Construction Week—I experimented by gently introducing the suggestion that basically everybody there is selling the same thing: *quality of life*.

I believe this is true and when you stop and think about it, the notion can apply to just about anything that companies are trying to sell. Sure, their offerings may have very specific applications but one way or another, just about everything in the market is intended to make the customer happier, more comfortable, safer and more secure, more efficient, more successful, more attractive, healthier. The list goes on forever, but in the end the idea is to provide something that in some way improves one's quality of life.

The reactions I got to this suggestion were markedly different depending on who I was talking with but generally, they fell into one of two types. There were a good number of people who grasped the theory immediately and looked through that lens to get a perspective on what they were offering to customers and just how much potential it held for delivering the goal, even if it simply made someone's life easier.

Other folks seemed to glaze over as if they were hearing an unfamiliar language. For the majority of those people, they couldn't seem to get beyond the immediate purpose of trying to sell as much of what they offered to as many buyers as they could. It didn't seem to matter whether the product or service met any abstract criteria or embodied lofty attributes as long as they were successful in piloting potential customers to the finish line.

There was something else I noticed about that second group. Many of them approached the conversion process by selling *against* the competition rather than concentrating on communicating the benefits and positive elements of their brand and product lines. This was particularly noticeable in the case of one young man who spent half of the time it took him to tell me about his particular offering, bad-mouthing the main competitor in his sector.



At one point I actually called this to his attention but he glossed over my comment and went right on delivering the rehearsed spiel that he was apparently comfortable with. I was not immediately in the market for what his company produces. But I can tell you that his failure to acknowledge, or at least hear, the basic message put me off. It is highly unlikely that I will seek out his brand the next time I'm specifying that particular building material category.

Now, in his defense, I realize that it can be challenging to make a meaningful pitch and provide any kind of relevant message when the attention spans of half the attendees at the event are compromised by toting bulging plastic schwag bags under each arm with giveaway yardsticks poking out (actually, this year they appeared to be four feet long, not three). So, maybe quality of life, much like beauty, is in the eye of the beholder. And maybe he knows his customers better than it seemed and I'm just not giving him enough credit.

After all, it helps if you can read your audience no matter what you're selling. **GB**

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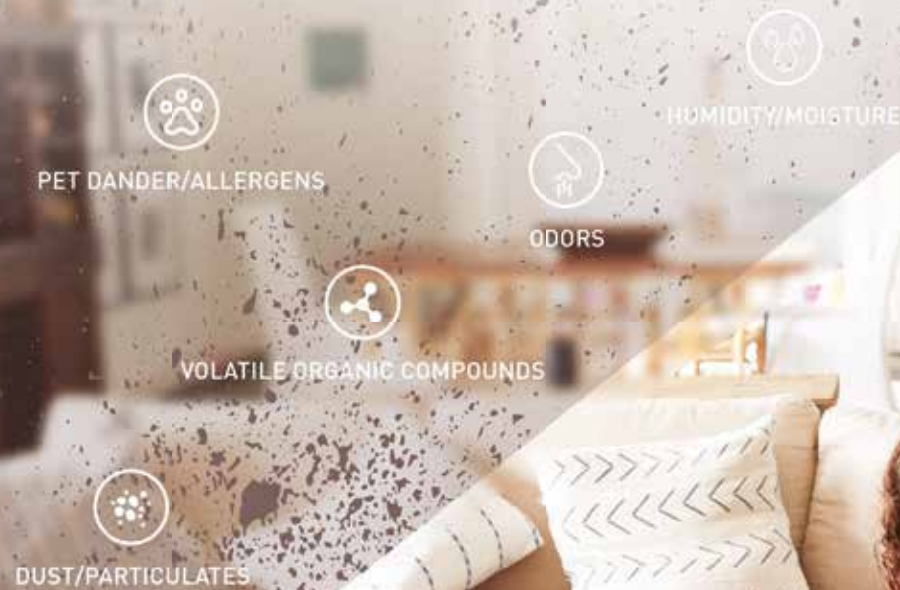
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