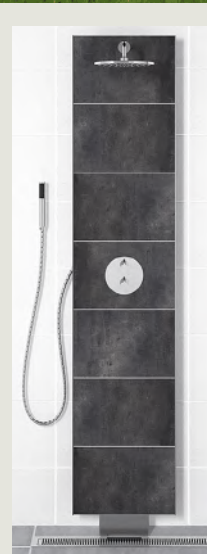


Award-Winning Coverage of Sustainable Construction, Products and Lifestyles

GREEN BUILDER®

March/April 2022 / www.greenbuildermedia.com



Sustainable Products of the Year

Here's our annual short list of the 50 best innovations and upgrades for your next project, plus our first annual Decarbonization Dozen Awards.

ALSO IN THIS
ISSUE

**The 2022 Green
Builder Brand Index**

Which companies had a green message that rang true? Which lost their mojo?

A man in a dark raincoat and hood stands in the rain, holding a small, fluffy white dog. He is looking towards the camera with a slight smile. The background is a dark, rainy street scene with a wooden building.

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TRANE®

It's Hard To Stop A Trane.®



2022

Brand Leader

2022 Brand Leader: HVAC

Trane Vision For a Sustainable Future

For over a century, Trane has been a leading provider of precision engineered HVAC solutions with a focus on efficient indoor comfort from long-lasting systems. Trane's commitment to a sustainable future is evident in this continuous innovation of home comfort that seeks to maximize comfort while reducing environmental impact. This dedication can be seen in the design and rigorous testing of Trane products that are pushed beyond industry standards to ensure they can withstand the toughest conditions.



How Trane Products Make Homes More Sustainable

As America's Most Trusted® HVAC System, Trane is known for building reliable and sustainable products that are efficient to operate throughout all seasons with less energy consumption. From its high-efficiency heat pumps that automatically adjust to maintain a set point with a 1/2 degree to its all-aluminum Spine Fin™ coils on all outdoor products – Trane's calculated engineering of these state-of-the-art systems ensures each unit runs cleaner, while reducing long-term energy usage.

Trane ESG Initiatives

Knowing that heating and cooling account for 25% of the world's total carbon emissions, Trane plays a pivotal role in Trane Technologies' commitment to ESG, as the company is working aggressively to reduce one gigaton (one billion metric tons) of carbon emissions from its customers' footprint by 2030. To achieve this goal, Trane is continuing to develop more sustainable ways to heat and cool buildings and homes, from deploying passive heating and cooling techniques to facilitating real-time energy consumption reduction technologies.

For more information on Trane's Vision for a Sustainable Future visit: greenbuildermedia.com/blog/watch-trane-technologies-esg-initiatives

SPONSORED

Geothermal's Moment Has Come

Converting to net-zero, all-electric living may take decades, unless we re-examine low-input energy sources such as ground source heat pumps.

THIS YEAR, WE LEARNED FIRSTHAND that “all electric” living won’t happen overnight. For example, our Scottsdale exhibition remodel took on the task of converting from gas to electric. What we learned is that the electric grid, locally and regionally, may not be ready for such a huge new electrical load. Even with the addition of solar panels, a home that’s heated and cooled with air-source heat pumps, with a couple of electric cars in the garage, puts great strain on the nearest transformer.

But we all may have overlooked one ready-to-go solution: geothermal (ground source) heating and cooling loops. A geothermal system achieves much of its BTU output with the operation of small, energy-efficient pumps and a compressor. Modern air source heat pumps, with which almost every home builder is familiar, “extract” heat from ambient air to cool or heat an indoor living space. But compared to ground source heat pumps, they’re still energy intensive.

Geothermal systems require less of an electrical assist to achieve the same level of conditioning as air source heat pumps, gas or oil-based furnaces. One key, [according to international researchers](#), is that most other heating sources rely on high-temperature ranges between inputs and outputs. Geothermal, on the other hand, takes a slow and steady approach, tapping into the natural, fairly consistent temperature of the Earth, or in some cases, a river or lake.

THE BIG PICTURE

Over the last 20 years, the biggest changes in geothermal technology can be seen at larger scales.

“Surprisingly, even in cold northern climates, most of the HVAC demand in commercial buildings is for cooling,” notes Paul Selking, vice president of commercial sales and marketing for [WaterFurnace](#). He explains that because of all the appliances and other heat-producing equipment in these buildings, geothermal loops end up carrying away heat more often than introducing it. But inside that “waste” heat is energy treasure.

“It’s all about this heat recovery idea,” he explains, “With the advent of variable speed compression and variable speed pumping, this means I don’t need to pull more energy out of anywhere; I just need to share the heat where it’s needed in my space...even more so in bigger projects, commercial and multifamily.

“Ideally you’re pulling off the cooling loop of your geothermal,

and having that loop feed the domestic hot water heater, which has a sealed loop in it. The only wasted energy out of that whole thing is a little compressor heat, but that’s pretty minimal.”

THE HOME FRONT

On the residential side, cost of installation has been the tripping point for geothermal system. But those costs have shrunk somewhat, thanks to compact drills. Some new rigs are no bigger than a Bobcat attachment.

Along with the technology’s low operating cost, geothermal systems boast a long lifespan. This should be part of any return-on-investment (ROI) calculation. “Even though the installation price of a geothermal system can be several times that of an air-source system of the same heating and cooling capacity, the additional costs may be returned in energy savings in 5 to 10 years, depending on the cost of energy and available incentives in your area,” notes [Energy.gov](#). “System life is estimated at up to 24 years for the inside components and 50-plus years for the ground loop.”

By comparison, most estimates I found suggest that the best air source heat pumps last 15 years or less.

It’s shocking to note that only about 50,000 ground source heat pumps have been installed to date. But I’m confident that as more people seek to achieve a net zero lifestyle with solar, operating a ground source heat pump will seem like a prudent and resilient choice. The pain of higher upfront installation costs will quickly dissipate as the house achieves a net zero-plus energy footprint.

It’s not just that. With geothermal HVAC, a home can go fully off grid with less battery storage. A couple of mini splits can quickly tap out a large solar array. With the same array and a geothermal system, the homeowners will have enough free, renewable electricity left over to power their smart, efficient, electric home. **GB**

Cost Comparison for 1 Million BTUs

★ Geothermal	\$8.79
High-Efficiency Natural Gas	\$14.95
Air Source Heat Pump	\$17.58
Standard Efficiency Natural Gas	\$17.75
High Efficiency Propane	\$30.65
Fuel Oil	\$34.17
Electric Furnace or Baseboard	\$35.16
Standard Efficiency Propane	\$36.40

SOURCE: U.S. DEPARTMENT OF ENERGY, ENERGY STAR



Matt Power
Editor-in-Chief

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SUSTAINABILITY Symposium 2022



ROADMAP TO DECARBONIZATION

Held virtually, April 20–21

We are in a climate emergency. Scientists from across the globe have confirmed that human-induced carbon dioxide emissions are intensifying climate change, and that we need a full-scale elimination of all greenhouse gas emissions to keep global warming to under 2 degrees Celsius—ideally, 1.5 degrees. If we surpass that threshold, which could happen in as little as five years, we'll encounter irreversible impacts leading to widespread species extinction and ecosystem collapse.

Fortunately, creating a net-zero carbon economy is no longer out of reach or expensive. We invite you to join us for the **SUSTAINABILITY SYMPOSIUM 2022: ROADMAP TO DECARBONIZATION ON APRIL 20–21**. At this virtual event, you will learn how we can expedite the transition to a **CLEANER, GREENER**, and **BETTER FUTURE** in which we can all enjoy a flourishing economy that is not only free of carbon emissions, but offers the opportunity for incredible capital gains for those with just a little ambition and imagination.

SESSIONS INCLUDE



PAUL HAWKEN
Regeneration: Ending
the Climate Crisis in one
Generation



ROGER BALLENTINE
Fighting Climate Change
with Capitalism



SANDRA WADDOCK
Reset: Changing Mindsets
and Paradigms in a World of
Wicked Problems

FEATURED PANELS

PESG Essentials
WITH C.R. HERRO, SCOTT TEW
AND EDDY SOFFER

**Decarbonization Solutions for
the Built Environment**
WITH STEVE EASLEY, PETER PFEIFFER
AND BRONWYN BARRY

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SAM RASHKIN

**This isn't gloom
and doom.**

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to rise to the
top of the home
building industry
during times of
intense change.



Green Builder Media and Sam Rashkin have joined forces to launch Housing 2.0, a comprehensive training and education program designed to teach building professionals how to prepare themselves for the massive transformation that the housing sector is currently experiencing.

The program helps building professionals design and construct higher performance, healthier, more sustainable homes, optimizing the total housing user experience with an estimated 30 to 70% hard cost savings/added value.

THE HOUSING 2.0 PROGRAM INCLUDES:

6-PART WORKSHOPS (offered quarterly) that explore the Housing 2.0 fundamentals

6 ONLINE COURSES with national thought leaders that delve into key topic areas like integrating digital technology, demystifying zero carbon, advanced health controls and sensors, offsite construction, and biophilic design

HANDS-ON ACTION GROUPS that allow building professionals to apply the Housing 2.0 fundamentals to real projects

COGNITION Smart Data insights into market trends, market influencers, purchase drivers, behavioral patterns, and innovations transforming the market

RASHKIN'S SECOND BOOK, titled *Housing 2.0, A Builder Guide to Surviving Disruption*

ARTICLES, BLOGS, VIDEOS, AND EXTENSIVE EDITORIAL COVERAGE generated by Green Builder Media's award-winning editorial team

This program is perfect for anyone in the home building industry—CEOs who want to strategize new directions for their business, niche and production builders who want to offer a new product or serve a new demographic. Or how about access to this program as the ultimate perk to attract new hires or to reward stand-out employees?

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[greenbuildermedia.com/
housing-2.0](https://greenbuildermedia.com/housing-2.0)

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A man, a woman, and another man are standing in a modern home, looking at a smartphone together. The man on the right is holding the phone, and the woman is pointing at the screen. The man on the left is looking on. They are in a room with large windows and a decorative wall with green dots.

SQUARE D™

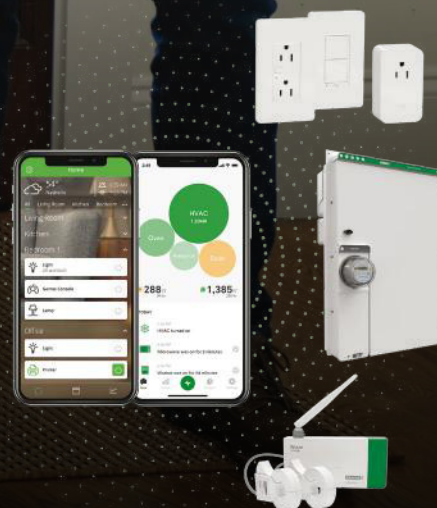
Home made energy efficient

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And, with Square D™ Energy Center, it's easy to add and manage backup energy sources such as solar, batteries, and generators.

Learn more about the full line of connected home solutions at our site.

se.com/us/connectedhome



Arizona Utility's Attempt to Charge Extra for Solar Owners Fails Legal Test

The federal court's decision could lead to more rate-related lawsuits against utilities.

A Ninth Circuit Court of Appeals panel has unanimously ruled that Salt River Project (SRP), a Tempe, Arizona-based public utility serving 2 million Phoenix metropolitan area residents, can be held liable for violating antitrust laws by charging customers who own rooftop solar panels higher electricity rates. Such a decision opens the door for lawsuits against energy providers suspected of price gouging, according to Justice Department attorney Matthew Mandelberg.

In 2015, the utility approved a rate increase of 3.9 percent per month for non-solar customers. Those who also used solar power were charged up to 65 percent more, according to appellate panel judge Eric Miller. SRP also undertook a \$1.7 million advertising campaign to promote its increased rates for solar customers. "Not surprisingly, applications for solar-energy systems in [Salt River Project] territory decreased by 50 to 96 percent," Miller notes. The case has been referred to a trial judge, who will determine the monetary damages to SRP solar customers.

SRP's unique ownership structure makes it immune to



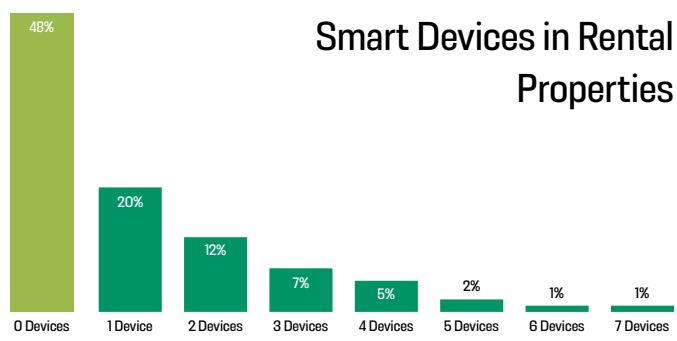
Water woes. The Salt River Project's Bartlett Dam is one of nearly a dozen components making up the embattled utility's hydroelectric energy system, which serves 2 million Phoenix-area residents. CREDIT: ANDY PERNICK/BUREAU OF RECLAMATION

price-related regulation, according to utility attorney Daniel Volchok. "Courts should respect the legislature's choice to allow SRP to set its own rates," he notes. "A single business raising its rates does not violate [federal antitrust law]."

But Mandelberg argues that fair business practices should be paramount. "Solar customers want and benefit from more competition," he notes.

Smarter Thermostats Top Renter Wish List

Although still divided on the importance of smart tech, about half say they will pay more for the right product.



Strong desires. Almost half of all renters surveyed do not have smart devices. Meanwhile, nearly 40 percent have up to three such items, according to Rent.com. CREDIT: RENT.COM

Eighty-two percent of renters say they want at least one smart device in their home, but 48 percent don't have one, creating a golden opportunity for vendors to sell these devices, according to a new survey by Rent.com. Renters are also willing to pay about \$40 per month to have at least one of the devices where they live, which is welcome news for landlords looking to update their properties, Rent.com notes.

Renters in homes and apartments wanted the most popular smart home devices—thermostats, lights and locks—fairly equally. For example, 46 percent of renters in houses and 45 percent of apartment residents wanted a smart thermostat, while 45 percent of respondents in homes and 42 percent of survey takers in apartments wanted smart lights.

The importance of smart home technology divided residents. Thirty-five percent of respondents said that smart devices were important or extremely important to them; 36 percent were neutral on the subject. Another 26 percent said they didn't care or didn't see smart home technology as important.

Survey results are available at rent.com.

Duke Energy Accelerates Decarb Plans

The power giant now plans to eliminate coal use entirely within 13 years.

Duke Energy, the nation's second-largest power company, plans to eliminate 95 percent of its coal-fired energy production by 2030 and shut down all of its coal plants by 2035, 13 years ahead of schedule. The company also expects to more than double its power generation from solar and wind over the next eight years, and spend more than \$100 billion on clean energy projects over the next decade.

According to a news release, Duke is expanding its decarbonization goals to account for emissions associated with the electricity it purchases and some of the products it sells. The company has already cut carbon emissions by 44 percent



Great big bang. The Crystal River coal plant, which provided energy to nearly 2 million Florida residents for more than 50 years, was destroyed by Duke Energy in 2021 as part of its move to net-zero emissions status by 2050. CREDIT: COURTESY OF DUKE ENERGY

from 2005 levels—the equivalent of removing 13 million vehicles from the road—and is on pace to meet earlier goals of 50 percent less emissions by 2030 and net zero status by 2050.

While they applaud Duke's efforts, advocates note that the new plan only deals with use of coal, not other fossil fuels such as natural gas. The company, they say, remains misaligned with the Biden Administration's target of decarbonizing the power sector by the middle of next decade.

Another Pandemic Backlash: Living Large

Even as the pandemic trends downward and people return to work, the average square footage of a new home is on the rise.



American excess. New houses are at their largest average square footage since the Great Recession, and are expected to get even bigger thanks to a pandemic-created preference for working at home.

CREDIT: JHORROCKS/ISTOCK

The average size of the single-family home got bigger in 2021, due in part to a continued need or desire to work from home during the pandemic. According to a report by NAHB, median single-family square floor area increased to 2,338 square feet, while average square footage for new single-family homes increased to 2,561. The numbers reflect increases of 6.3 percent and 10 percent, respectively, from sizes recorded during the middle of the Great Recession in 2009. Homes had been steadily dropping in square footage until then.

Home size rose from 2009 to 2015 as entry-level new construction was constrained, and then declined between 2016 and 2020 as more starter homes were developed, according to NAHB. "Going forward, we expect home size to continue to increase, given a shift in consumer preferences for more space due to the increased use and roles of homes for work, among other purposes, in the post-COVID-19 environment," NAHB Chief Economist Robert Dietz notes.

Findings were derived using data from the U.S. Census Bureau's [Census Quarterly Starts and Completions by Purpose and Design](#) and NAHB analysis.

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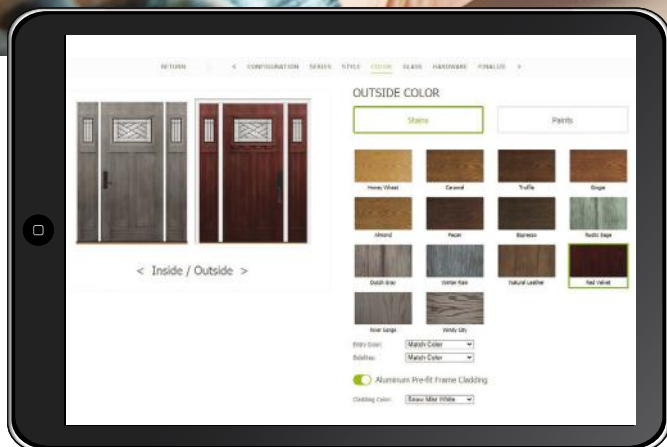
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2022 Green Builder Sustainable Products Of The Year

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CONTROLS, PANELS AND SENSORS

COOLING AND HEATING

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"We expect home size to continue to increase, given a shift in consumer preferences for more space, due to the increased use and roles of homes for work in the post-COVID-19 environment." **Page 7**

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Greenhouse gases have the world holding its breath. But some companies are working to clear the air—and more.

ALSO NEW THIS YEAR

"Editors' Choice: The Decarbonization Dozen." Twelve of our top 50 products have been singled out for a second level of recognition. These products go "above and beyond" to move the needle on CO₂ reduction.



BY GREEN BUILDER STAFF

THE CLOCK IS TICKING.

Each day seems to bring new warnings about the human acceleration of climate change. We have less time than we thought to clean things up before environmental damage becomes irreversible.

Formerly "The Hot 50," *Green Builder's* annual list of prominent, enviro-friendly products has a new handle: "Sustainable Products of the Year." This change is intended to help the 50 annual recipients spread word of their innovations to the wider world.

Congratulations to this year's trend setting, game-changing product manufacturers.

BILCO Thermally Broken Roof Hatch

Heat always flows to a cooler space. In summer, that means warmth from the roof going into the house; in winter, heat leaves the house the same way. The roof hatch's metal construction facilitates the temperature transfer, which can result in higher utility costs and condensation on the underside of the roof hatch.

BILCO'S thermally broken roof hatch is ideal for structures that require high energy efficiency, such as those in areas with extreme temperature conditions and humidity. The roof hatch features R-20+ insulation, and a frame and cover design that minimizes heat transfer between interior and exterior metal surfaces. It also reduces interior condensation buildup. The result? Superior energy efficiency.

The product also features special ethylene propylene diene monomer (EPDM) rubber gasketing with enhanced weather and wind resistance, meets LEED standards for recycled content, and has a high solar reflective index (SRI).

FOR MORE INFORMATION: BILCO.COM



CETCO COREFLEX waterproofing membrane

Anyone who works with decks, housing walls, foundations or green roofs dreads the impact of water on construction elements. CETCO's *COREFLEX* is a dual-membrane waterproofing system that combines passive and active barriers to substantially reduce the possibility of leaks. The traditional passive barrier blocks water, while the active volcanic bentonite component of its core absorbs up to 15 times its volume in water, expanding to seal cracks using the water's own pressure to fill and block any gaps.

The *COREFLEX* reinforced thermoplastic membrane is engineered to resist high hydrostatic pressure and groundwater contaminants typical of foundation conditions. In addition to waterproofing performance, the PVC layer of *COREFLEX* serves as a root barrier, reducing the number of assembly components for green roof applications.

The membrane's extremely low water vapor transmission qualifies it as a Class A Vapor Retarder per ASTM E1745.

FOR MORE INFORMATION: MINERALSTECH.COM



OX Engineered Products OX-IS structural insulation

OX Engineered Products' *OX-IS* continuous wall insulation adds a structural thermal layer of insulation outside rim joists, wall cavities and wall studs. This prevents thermal loss/thermal bridging, mitigates moisture production in walls and nearly eliminates air infiltration through the sheathing.

The product's best-in-class air barrier performance makes it up to 20 percent better than oriented strand board (OSB) plus house wrap. Continuous insulation can also achieve high R-Value code compliance with 2-inch by 4-inch framing, and help the structure achieve a lower HERS rating.

OX-IS is made from at least 70 percent post-consumer recycled content, reducing landfill volumes. One inch of the product reduces home heating and cooling costs by 35 percent; 50 percent when used with other energy construction measures.

FOR MORE INFORMATION: OXENGINEEREDPRODUCTS.COM





Appliances

LG WashTower with DUAL Heat Pump dryer

With an ultra-convenient and space-saving design, LG's WashTower with DUAL Heat Pump dryer is a streamlined alternative to a conventional washer-dryer stack. The front-load washing machine uses LG's Artificial Intelligence Direct Drive (AI DD) steam technology to deliver clean, fresh clothes.

The dryer leverages LG DUAL Inverter Heat Pump technology to extract moisture and recycle it for more-energy efficient drying. Energy consumption is cut by up to 50 percent through the unit's use of a low temperature throughout the drying cycle.

LG WashTower's lower overall height helps save space through a ductless design that requires less clearance with the back wall. The ductless design also saves owners the inconvenience of having to regularly access and clean out the rear ducts. The seamless, flat design contributes to an easy-to-access *Center Control* panel and a sleek, built-in look in the laundry room.

FOR MORE INFORMATION: [LG.COM](https://www.lg.com)



Signature Kitchen Suite 36-inch Flex induction cooktop

For those moving away from natural gas-powered ranges, induction cooktops offer a more efficient, safer option. Signature Kitchen Suite's 36-inch Flex model covers the bases:

four inductors, with each zone providing up to 3,700 watts of power. The 11-inch dual-center element delivers 7,000 watts of power, making it the industry's most powerful center induction element.

An innovative Wi-Fi feature, powered by *ThinQ Technology*, allows monitoring of the on/off status of the cooktop elements from a mobile device using the *Signature*

Kitchen Suite app. When combined with a Signature Kitchen Suite *Pro-Style Hood*, *ThinQ Technology* enables the cooktop and hood to communicate and synchronize the elements and fans.

In addition, a 7-inch color LCD touch control makes the unit easy to use and clean. And with the thinnest profile in the industry, *Flex* can be installed completely flush and blend seamlessly with countertops.

FOR MORE INFORMATION: [SIGNATUREKITCHENSUITE.COM](https://www.signaturekitchensuite.com)



Whirlpool 30-inch Induction Cooktop

When it comes to energy efficiency and kitchen ranges, the faster, the better. Whirlpool addresses this claim with its *30-inch Induction Cooktop*, which uses electromagnetic technology to transfer energy directly to the cookware, heating it up faster than with gas. Because induction skips the step of heating the cooktop, and less heat is lost to the surrounding air, it's an efficient, even cooking method that also saves energy.

The product includes or offers several cooking modes, such as Fast Boil, which can cut the time needed to boil water by up to 25 percent; Quick Clean Up, made possible by touch-activated controls that remain cool thanks to induction-style heating; and Assisted Boil and Assisted Pan Frying, which alert the food preparer as to when the proper temperature has been reached to add food to the cookware.

FOR MORE INFORMATION: [WHIRLPOOL.COM](https://www.whirlpool.com)



Bath fixtures



Flow Loop *Eco Loop* recirculating shower

Taking a shower wastes a lot of water—roughly 18 gallons goes down the drain in a mere 8 minutes—as well as all of the energy needed to heat that water. Flow Loop's *Eco Loop* recirculating shower passes used water through a filtration system and sends it back through the showerhead for reuse. The filtered water is actually cleaner than before, and comes out about 50 percent higher flow, resulting in a savings of up to 90 percent water and 25 percent energy overall.

The product's extensive filtering method—a pre-filter for hair and dirt, a self-cleaning micro-filter for skin and particles, a membrane pump to draw water from the shower floor, an ultrasonic descaler for hard water residue, and a UV filter to kill bacteria, microorganisms and viruses—makes the shower water safe enough to drink, the company adds.

FOR MORE INFORMATION:
FLOW-LOOP.COM



Niagara *Shadow Single Flush Toilet*

One of the biggest consumers of household water, the toilet, gets a downgrade from Niagara—and that's a good thing. The *Shadow Single Flush Toilet* with *Stealth Technology* is a powerful, quiet and quick cleaning unit that gets the job done in as little as 0.8 gallons per flush (GPF), at up to 1,000 grams of miso paste.

The *Shadow Single Flush Toilet* is also available in a 1.28 GPF version. Both versions are WaterSense certified by the U.S. Environmental Protection Agency, meaning they use at least 20 percent less water than regular models.

In addition, the toilet's thin tank design and smooth bowl will upgrade the appearance of any bathroom. The unit has an extra-large footprint, enabling easy coverage of old tile during install. Overall installation is quick and easy, making it more cost effective for the installer and homeowner.

FOR MORE INFORMATION: NIAGARACORP.COM

Nebia by Moen *Quattro* showerhead

Moen and Nebia have a full house with their new *Quattro* showerhead: a device that offers four types of shower experiences—relieve, soothe, clarify and cleanse—while using only half the water of a typical unit and providing up to 60 percent more flow.

A family of four can save about \$300 annually on heating and water costs when using a *Quattro* showerhead, meaning the device will pay for itself in about four months, according to Nebia. It is also another step toward Moen's goal of saving 1 trillion gallons of water by 2030 with its products, the company notes.

The handshower's dock is made from recycled ocean plastic, and features Moen's *Magnetix* technology. A powerful magnet allows for easy release and secure return of the handshower. The showerhead is installed in minutes utilizing existing plumbing—simply unscrew the previous showerhead and replace.

FOR MORE INFORMATION: MOEN.COM





Cabinets and Furniture



Lee Industries *naturalLEE* furnishings

Lee Industries' new furniture has a lot of good stuff in it. The company's eco-friendly products, from armchairs to sofas, feature seat cushions made with 30 percent soybean oil, which reduces the amount of petroleum used. Back and throw pillows are filled with 100 percent recycled fibers made from clear and white plastic bottles. The seat deck and trim pads are 80 percent regenerated fibers. Arm padding is made with soy-based polyol.

Furniture finishes have very low VOCs. Cushion springs are 80 percent recycled metal. Fiber fabrics come from organic and natural sources. Wood for frames comes from certified sustainable forests and laminated components are bonded with a soy-based resin.

All of these elements result in a long-lasting product that stays out of landfills, leaving a smaller environmental footprint, the company adds. And, nearly all of its raw materials are used in making other lines of products.

FOR MORE INFORMATION: LEEINDUSTRIES.COM

nobilis *Modern Kitchens*

This German furniture maker recently entered the American market with its line of sustainably designed kitchen furniture. On the outside, there are natural wood tones like walnut and oak, along with earthy neutrals, that promote the feel of modern design.

On the inside, there are natural components: Most wood for construction comes from sustainably managed semi-natural forests and carefully controlled sources. But 30 percent is recycled material. Meanwhile, a specialized packaging process offsets CO₂ emissions created during transport. And, all packaging is collected and recycled.

Throughout Europe, nobilis is known for environmental practices. The company holds nine awards and certifications dedicated to best practices in quality, environment and energy—from being the first kitchen furniture manufacturer awarded the “Blaue Engel” eco-label, to being part of the Climate Pact for the furniture industry since 2016.

FOR MORE INFORMATION:
NOBILIAKITCHENFURNITURE.COM





Controls, panels and sensors

EnOcean STM 550 multisensor module

EnOcean's STM 550 multisensor module combines sensors for temperature, humidity, lighting, acceleration and a magnetic contact within a single case, offering data for a wide range of applications in digitized buildings and the Internet of Things (IoT). An integrated solar cell enables the sensor to supply itself with energy independently and store it for uninterrupted operation over several days with little or no light. It also sends reports on the internal energy level and the amount of light available on the solar cell.

STM 550 is completely maintenance free. Being wireless, the multisensor can be installed anywhere and be used exactly where data is needed: on walls, ceilings, windows, doors, furniture, active devices such as air conditioners, towel dispensers, and objects such as printers, copiers, medical equipment or vending machines. The multisensor can operate with an NFC reader, smartphone or tablet.

FOR MORE INFORMATION: ENOCEAN.COM



Orro Smart Living System

Can there ever be too much of a good thing? Not if you're Orro. The company has expanded the capabilities of its *Smart Living System*—a human-centric, wellness-driven lighting and smart home control system in the form factor of a standard-sized light switch—with new hardware and enhancements for third-party lighting control, including connections to more switches, dimmers, plugs, outlets and lighting systems.

The company's flagship device, *Orro One Pro*, features an integrated touchscreen, voice-activated controls, and daylight and motion-sensing technologies. These elements provide automated, intelligent lighting controls and painless compatibility with other devices and systems, such as Alarm.com, Sonos, Nest, Ring, ecobee and Control4.

In February, the company introduced a lighting-only version, *Orro S*, with the same human-centric lighting, at a price that's accessible to any budget.

FOR MORE INFORMATION: GETORRO.COM



Schneider Electric Square D Energy Center

Schneider Electric's *Square D Energy Center* is an all-in-one home energy system that provides energy usage insights and monitoring capabilities for real-time residential energy use. Users can monitor and custom-control energy use from across a home's entire ecosystem with a single app. It can also enable simplified and automated backup power from batteries and generators, and even activate a photovoltaic system when used in combination with a battery during grid outages. The energy center can also be utilized to easily integrate an electric vehicle charger.

Meanwhile, builders can easily address changing building regulations, including California's Title 24 Building Energy Efficiency Standards. A straightforward integration of solar and storage, and an integrated and field expandable backup panel, makes the energy center an easy and simplified install—which means lower expenses for the builder and homeowner.

FOR MORE INFORMATION: SE.COM



Phyn Plus Smart Water Assistant + Shutoff

The second-generation *Phyn Plus Smart Water Assistant + Shutoff* is 25 percent smaller, lighter and more affordable, empowering more consumers to conserve and save water, and protect their homes against water damage. The device has a more-compact power supply and redesigned enclosure to reduce size and volume for installation in tight spaces. But the new *Phyn Plus* retains the powerful performance capabilities of the award-winning original *Phyn Plus*.

Installed on a single location on the main water line, the second-generation *Phyn Plus* protects and monitors a property's entire plumbing system by automatically detecting all types of leaks. *Phyn Plus* also monitors each fixture's water use to identify areas of excess water use and plan conservation. Additionally, the device pairs with Phyn's new *Smart Water Sensor*, a puck-size leak detector for high-risk areas that can activate the shutoff valve when it comes into contact with water.

FOR MORE INFORMATION: PHYN.COM

Toshiba Carrier VRF Touchscreen Controller

Building managers have a hard enough time keeping track of a handful of variable refrigerant flow (VRF) systems. Imagine if they have more than 100! Carrier's new *Toshiba Carrier* touchscreen controller for VRF systems can connect up to 128

indoor units to one easy-to-use interface. This device allows building managers to access their entire VRF system from one central location, eliminating the need to monitor units individually.

A compact touchscreen provides a menu with intuitive navigation that allows for advanced scheduling for indoor and outdoor units to maximize comfort and energy savings. Plus, the touchscreen control user can export system data directly from the device. With this feature, users can analyze alarm outputs and troubleshoot various issues easily and efficiently. Furthermore, the exported data can be used to determine root causes and correlations of the system settings, allowing for effortless system optimization.

FOR MORE INFORMATION: CARRIER.COM





Airzone VAF HVAC Zoning Solution

Regulating and maintaining indoor temperatures can be difficult and expensive. Airzone's *VAF HVAC Zoning Solution* simplifies the heating and cooling of a home, and reduces the energy needed to run an HVAC system. The product allows use of a less-powerful air conditioning unit by cutting the thermal load by up to 36 percent when cooling, and up to 22 percent when heating. The result, according to the manufacturer, is an average energy cost decrease of about 41 percent.

The benefits for underfloor heating and fan coil systems are similar, with the user seeing energy savings of 25 percent to 41 percent, depending on the climate and thermal unit's load behavior.

Meanwhile, the Airzone Communication Gateway uses operation mode, heat pump set-point temperature and ventilation speed to determine the HVAC's most-effective performance. Airzone VAF does not require any bypass damper, making it the most-efficient zoning solution for HVAC installations.

FOR MORE INFORMATION: AIRZONECONTROL.COM



Carrier evaporator coil with Vertex technology

Planning ahead for the Department of Energy's 2023 energy efficiency requirements, Carrier has unveiled a new evaporator coil with *Vertex* technology, for use in home air conditioning systems. *Vertex* delivers more-controlled and uniform airflow over the coil to improve heat transfer, reduce pressure drop, and increase system efficiency and reliability.

The coil's "V" design channels water away from the coil's superheated region to minimize condensate blow-off. Its unique geometry also reduces condensate sweating by reducing the amount of surface inside the cabinet exposed to conditioned air. A lighter, corrosion-resistant aluminum construction increases system efficiency and durability. Brazed joints positioned at the top of the coil, away from condensate, provide further corrosion protection.

The installation process remains the same as with current evaporator coils. However, service is improved, with a front-mounted TXV and full access to all sides of the coil for cleaning.

FOR MORE INFORMATION: CARRIER.COM





LG Inverter Heat Pump Water Heater

LG Electronics' Inverter Heat Pump Water Heater (IHPWH) brings out-of-the-box thinking to basic water heating. The unit delivers hot water with an ENERGY STAR-certified efficiency of 3.75 uniform energy factor (UEF), up to six times more efficiently than standard conventional gas and electric water heaters. The unit's inverter compressor allows operation at 23 degrees Fahrenheit ambient air temperature, meaning hot water is available well into a cold winter.

Electric heating elements provide for when hot water demand is higher. The LG IHPWH has a first-hour delivery of 66 gallons, without supplemental electric resistance heat, and supports a first-hour delivery of up to 80 gallons in Turbo Mode.

With Wi-Fi capability, the IHPWH can be managed remotely with the LG ThinQ phone app. The user can set the water heater to Away or schedule off time when hot water is not needed.

FOR MORE INFORMATION: LGHVAC.COM

Rheem Prestige Series Variable Speed Heat Pump

Rheem's EcoNet-enabled, inverter-driven Prestige Series Variable Speed Heat Pump provides cooling efficiencies up to 54 percent higher and heating efficiencies up to 34 percent higher than typical heat pump designs. Efficiency benefits of this ENERGY STAR-certified unit include a Seasonal Energy Efficiency Rating (SEER) of up to 20, a Heating Seasonal Performance Factor (HSPF) of up to 11 and an Energy Efficiency Ratio (EER) of 15.

With inverter technology, the scroll variable-speed compressor adapts to any kind of weather. The compressor also uses 70 percent fewer moving parts, and can save the owner more than \$7,000 over the unit's lifetime.

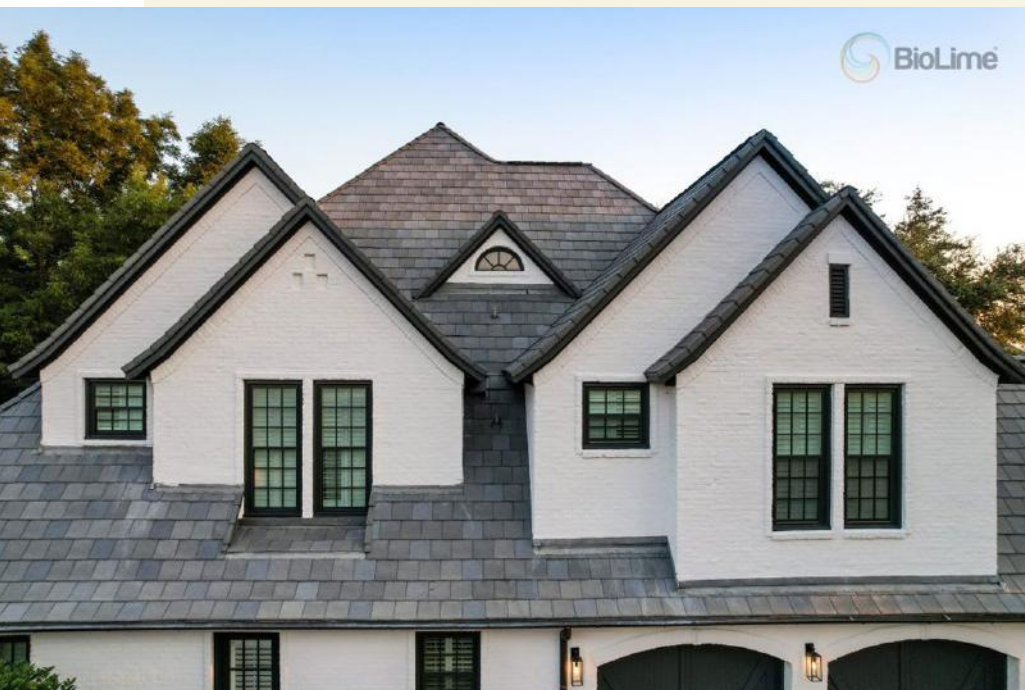
Innovative EcoNet technology monitors and controls the heat pump, ensuring optimal performance and energy efficiencies in the home, and providing maximum energy savings. The optimized fan vent contributes to a quieter operation, while the composite base pan design helps eliminate corrosion.

FOR MORE INFORMATION: RHEEM.COM





Exteriors, Coatings and Siding



BioLime Natural Lime Plaster

BioLime's *Natural Lime Plaster* offers a durable and natural exterior cladding for modern homes. The product helps make a house fire resistant, warmer in winter, cooler in summer and resistant to bugs, termites and bacteria. It also absorbs carbon dioxide from the air as it sets, a subtle, eco-friendly bonus.

BioLime's plaster mitigates moisture entrapment in sub-surfaces, thanks to its natural composition and elevated pH. The exterior gains the ability to counteract formation and proliferation of molds and mildew.

The product also comes in zero-VOC formulations for interiors, one-coat projects, mortar, brick masonry and putty, and as interior and exterior paints.

FOR MORE INFORMATION: BIOLIME.COM

Fiberon Wildwood composite cladding

Fiberon, which has seen its decking products often used as cladding, makes it official with *Wildwood*, the company's first item specifically for cladding. A sustainable alternative to the traditional wood variety, *Wildwood* is a toxic chemical-free composite featuring 94 percent pre-and post-consumer recycled content—made from locally sourced recycled plastic and wood fiber destined for landfills and incinerators—and is manufactured in an environmentally friendly manner. No rainforest species are used.

Wildwood can be used in horizontal or vertical applications, and for soffits, ceilings, rainscreens and more. The product features an open-joint profile that utilizes a concealed face fastener, providing a seamless look. According to the manufacturer, this product never needs sanding, staining or painting.

To help trade professionals address stringent building and energy codes, *Wildwood* facilitates better management of bulk water infiltration, capillary water intrusion and water vapor exfiltration, mitigating damage to residential structures.

FOR MORE INFORMATION:
CLADDING.FIBERONDECKING.COM





Fresco Harmony *Color Pack*

Fresco Harmony *Color Pack* is an extremely low-VOC wall and surface finishing system with water-based colorants. It's the nation's first color line for drywall joint compound. There's little to no material waste because the company uses ready mix joint compound, a medium that already exists on every job site.

The compound can be used on brick, stone, wood and tile to create a smooth look and feel. It can go over painted texture without use of primer. As a colored joint compound, it can be used on walls without needing to be painted. At about 25 cents per square foot, it's also significantly less expensive than other coating methods.

Each *Color Pack* is a complete unit that contains a specific Fresco Harmony color formula based on a mixing ratio of one 8-ounce bottle to 3.5 gallons of all-purpose joint compound. There are 40 different mixes.

FOR MORE INFORMATION:

FRESCOHARMONY.COM

Modern Mill *ACRE* sheets

Modern Mill's *ACRE* sheets help solve a huge problem: deforestation. Instead of trees, these panels, trim, decking and siding comes from discarded rice hulls. The product is virtually indistinguishable from wood and is often recommended by architects as a replacement for lpe, cedar and teak. It has a uniform texture, can be crafted with regular woodworking tools, and can be cut, sanded, fastened, nailed, glued, and stained or painted just like wood. *ACRE* sheets can be easily milled into flooring, cabinets, fencing, furniture and more. They are also water-, weather-, and pest-resistant, and guaranteed not to splinter, rot or crack.

ACRE products offer a homogeneous edge cross-section, meaning the edges do not require special treatment or need to be sealed or laminated. They are free of phenol, formaldehyde and adhesives, and are manufactured in a zero-waste environment. Also, they are 100 percent recyclable.

FOR MORE INFORMATION:

MODERN-MILL.COM





Floors and Surfaces



Caesarstone Pebbles Collection

Quartz surfacing products maker Caesarstone continues its design emphasis on nature—as well as its commitment to sustainability—with the *Pebbles Collection*, five designs that celebrate the transformation of clean energy producing wind and water over stone. Like all Caesarstone surfaces, these new designs feature high-quality material that is nonporous, durable, flexible, scratch and stain resistant, mold and mildew resistant, and lower maintenance than other natural surface materials. Caesarstone surfaces also never need sealing.

The company notes that all of its surfaces are crafted with the Earth in mind. All stages throughout the product life cycle stress environmental and human responsibility, which inspires audiences to continue to view the products as some of the most sustainable on the market. Caesarstone products and practices “drive human responsibility towards the environment and society, by creating a connection with nature from the heart of the home.”

FOR MORE INFORMATION: [CAESARSTONEUS.COM](https://www.caesarstoneus.com)

MILEstone Plaster 2.0 tile

Tile manufacturer MILEstone has released what it calls the porcelain industry’s first carbon neutral tile, *Plaster 2.0*. The product is a key part of MILEstone’s effort to be completely carbon neutral by 2030. Plaster tile has the lowest embodied carbon of any flooring product.

MILEstone products contain up to 60 percent recycled content and do not contribute to the negative impact of VOCs in building materials. More than 95 percent of raw materials used in the production of MILEstone tiles are sourced within a 500-mile radius of the company’s Clarksville, Tennessee factory, resulting in low transportation-related carbon emissions. The products can also help builders achieve LEED and WELL certifications.

MILEstone’s parent company, Florim U.S.A., holds several certifications and national awards for its ongoing efforts in sustainability, including Green Squared, a multi-attributed ANSI standard, and Tennessee Recycler of the Year for 2020.

FOR MORE INFORMATION:
[MILESTONETILES.COM](https://www.milestonetiles.com)





Mohawk *UltraWood* flooring

For people who want a sustainable alternative to traditional hardwood, Mohawk's *UltraWood* flooring is. The product is 90 percent recycled, post-industrial wood and is itself 100 percent recyclable. The manufacturing process also typically results in 10 times more natural hardwood per log when compared to traditional hardwood flooring production. And when a carbon sequestering tree is turned into *UltraWood*, the carbon stays locked away in the finished materials. This effectively removes carbon from the air and stores it in a long-lasting floor.

The product includes Mohawk's *Everlast* hardwood protection system, which promises four times greater scratch protection, two times stronger wear protection and five times greater dent protection; the company's patented *WetProtect* technology, which prevents water from leaking through and damaging the subfloor; and *EasyClean*, Mohawk's enhanced lacquer, which resists stains and soil buildup and keeps the floor looking its best.

FOR MORE INFORMATION: MOHAWKFLORING.COM



MSI *Woodhills Collection* waterproof flooring

MSI has achieved rapid success in the flooring market by tackling the perennial problem of maintenance and water resistance. One of its new products, the *Woodhills Collection*, is an engineered, fully waterproof (the sealing process is called *DryLuxe*) wood flooring.

Assuming it lives up to the company's claims, the *Woodhills Collection* offers a durable solution for laundries, baths and other areas where flooring takes a beating from spills and moisture exposure—in short, it acts like vinyl, but it's real wood, and it can potentially last for 20-plus years. The product includes MSI's stone core and pre-attached acoustic and comfort pad for quiet, easy-on-the-feet walking.

Woodhills, part of the *Everlife* line, is also designed for fast and easy installation, courtesy of MSI's patented, easy-click locking system.

FOR MORE INFORMATION: MSISURFACES.COM

Wilsonart *HPL Stone Collection*

Can an engineered surface product look good and help people breathe better? Wilsonart says it's possible, and has unveiled its High-Pressure Laminate (HPL) *Stone Collection* as proof. The nature-themed collection is GREENGUARD Gold Certified to meet low chemical emission limits for better indoor air quality. Additionally, about three-fourths of *HPL Stone* is made with fibers from FSC-certified, fast-growing, sustainably managed woods; the balance—a laminate industry-leading 23 percent—comes from post-consumer recycled content.

Wilsonart HPL surfaces can withstand the rigors of most interior environments. The collection is an excellent low-maintenance solution compared to other surfaces that require sealing or refinishing. Premium designs come with *AEON Enhanced Scratch & Scuff Resistant Performance Technology*. The entire Wilsonart *HPL Stone Collection* offers exceptional long-term value, with superior stain, wear, impact and scratch resistance compared to traditional veneers, vinyl and wood.

FOR MORE INFORMATION: WILSONART.COM



Lawns, Patios and Pools



ForeverLawn

With drought becoming an ever-greater problem—especially in the Western U.S.—people are moving toward dry heat-tolerant yards. *ForeverLawn* synthetic turf offers one solution. The lifelike, low maintenance and durable green landscaping requires no watering. That's significant, given that half of all household water in dry states like California or Nevada is used on real grass lawns, according to the U.S. Environmental Protection Agency.

ForeverLawn also helps reduce the introduction of chemicals into the environment, by eliminating fertilizers, pesticides, and weed killers that are commonly used to maintain natural grass landscaping. The product's multi-layered backing system features recycled and renewable materials; the final backing layer is comprised of recycled plastic bottles. A second layer features *BioCel* technology created from soybean plants—a 100 percent renewable resource.

Green builders may utilize *ForeverLawn* synthetic grass products to meet U.S. Green Building Council LEED guidelines.

FOR MORE INFORMATION:
FOREVERLAWN.COM

Hayward *Tristar VS 900* variable-speed pump

Swimming pools aren't cheap to run. Hayward's *Tristar VS 900* variable speed pump can make it a lot less expensive. With an industry-best Weighted Energy Factor (WEF) of 12.9 and ENERGY STAR-rated efficiency, the unit typically saves a home \$1,500 annually in operating costs, compared with traditional single-speed units. The *VS 900* pays for itself faster than larger, more expensive models.

The pump's advanced hydraulic design and 2.0 horsepower capacity make the *Tristar VS 900* outperform most high-performance pumps. An upgraded dual-voltage motor drive delivers 30 percent quieter high-speed operation than other models. A permanent magnet, totally enclosed fan-cooled motor provides better pump reliability and efficiency. Meanwhile, side and rear conduit entry accommodates high and low voltage connections for simple installation.

The company notes that Hayward variable-speed pumps overall have saved a cumulative 1.1 billion kilowatt-hours of energy since 2018.

FOR MORE INFORMATION: HAYWARD-POOL.COM





Loll Designs *Tessellate* planters

Tessellate planters, along with all Loll Designs outdoor furniture, are made from ultra-durable high density polyethylene (HDPE) partially derived from recycled single-use plastics like milk jugs and shampoo bottles. Milk jugs are used because of their lack of pigment, enabling creation of vibrantly colored products.

Although the planters and other items are 100 percent recyclable, HDPE material can't be recycled with typical curbside recyclables. Customers are encouraged to send parts or disassembled products back to Loll Designs, which will recycle metal objects and send the HDPE to an industrial waste facility for repurposing.

Loll Designs purchases its materials from American suppliers, and manufactures its items in U.S. facilities to reduce shipping distances and carbon emissions. Products are also shipped flat-packed to save on resources.

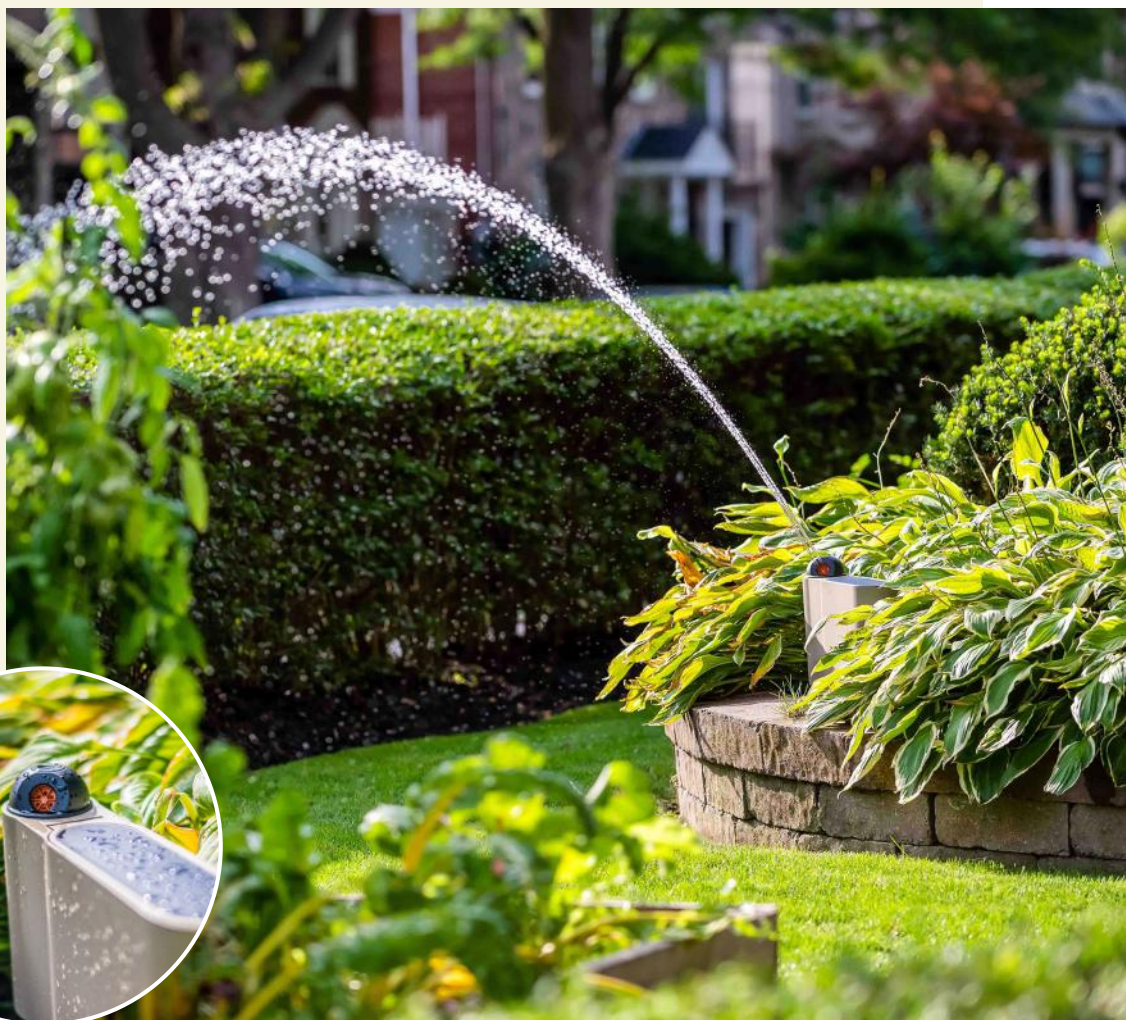
FOR MORE INFORMATION: LOLLDESIGNS.COM

OtO Lawn Smart Sprinkler

Not all lawns are shaped alike, which makes watering a challenge. Sprinklers can't reach all locations without wasting water on the sidewalk or other landscape. The programmable *OtO Lawn Smart Sprinkler* creates custom zones to match the exact shape of the turf, cutting a water bill and reducing errant runoff by up to 50 percent. The solar-powered, cloud-based unit also uses real time local and regional weather, wind speed, humidity and temperature data to adjust its schedule to deliver the perfect amount of water. This prevents running sprinklers in the rain or having the spray pattern blown off course by heavy wind.

With a smartphone, *OtO Lawn* can apply pet-, people- and planet-safe fertilizer, and pest control products when needed. The unit also easily sits on top of or at the edge of the lawn, meaning no trench digging is required.

FOR MORE INFORMATION: OTOLAWN.COM





Roofing



Westlake Royal *Sol-R-Skin BLUE* roofing underlayment

Westlake Royal Roofing Solutions (formerly Boral Roofing) has released its *Sol-R-Skin BLUE* roofing underlayment, an insulator designed to help provide protection from the elements and improve the roof's energy-saving capability. The underlayment has a radiant barrier aluminum surface, which reflects heat with an emissivity rating of 0.03, and a fiberglass mat beneath the aluminum, providing a second layer of heat resistance. These materials are combined into a single product with a rating of R-5.5 at the most effective location above the roof deck.

Suitable for use under nearly all steep-sloped roofing materials and in any climate or at any temperature, *Sol-R-Skin BLUE* is UV resistant, durable and easily installed. It offers Class A-rated fire resistance when applied with stone-coated steel, concrete or clay tile roof systems.

FOR MORE INFORMATION:
WESTLAKEROYALROOFING.COM

DuPont *Tedlar* PVF film

Designed to protect metal roofing and the backs of solar panels, DuPont's *Tedlar* polyvinyl fluoride (PVF) film is no friend to salt. The film laminate provides extreme resistance to harsh chemicals and corrosion—including seawater and salt spray—even for metal-roofed homes 1,500 feet from shore. *Tedlar* also helps prevent fading, chalking, cracking and blistering caused by UV exposure.

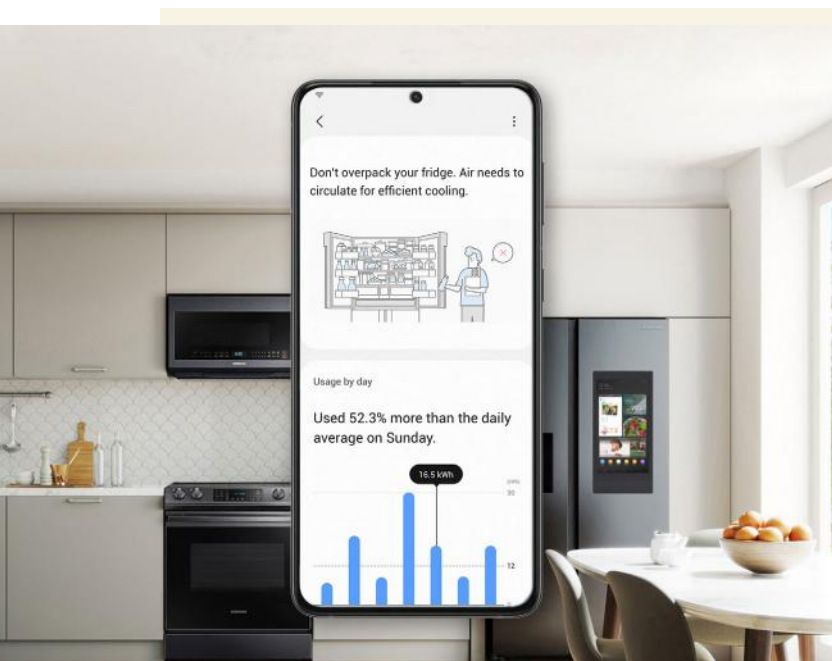
Tedlar's durability is exceptional. PVF is not soluble in any known solvent at room temperature, and it won't melt until the temperature hits 191 degrees Celsius (about 376 degree Fahrenheit). It's also resistant to mold and mildew, stains and graffiti, and harsh weather. The product offers excellent fire resistance and has low VOC emissions during processing. Thanks to chemical inertness, it can be cleaned with various cleaning agents.

FOR MORE INFORMATION: TEDLAR.COM





Smart Tech



Samsung SmartThings SmartThings Edge

Samsung SmartThings' home management tool has improved its control over home efficiency. The home automation company has released *SmartThings Edge*, an update to the *SmartThings* platform, designed to make it easier for users to control items such as front doorbells, appliances, lighting, garage doors and more. Under the update, transmissions from a handheld device bypass the cloud and go directly to the *SmartThings* hub within the user's home, speeding up processing time and enhancing data transmission reliability.

Also under *SmartThings Edge*, users will be able to control SmartThings-driven local devices, even if the internet is down. Local hub-based operation will also make the system more secure compared to when it runs through the cloud, the company notes.

SmartThings users will also be able to connect Zigbee, Z-Wave, and LAN-based integrations, with the ability to connect more protocols in the future, including Matter.

FOR MORE INFORMATION: [SMARTTHINGS.COM](https://www.smartthings.com)

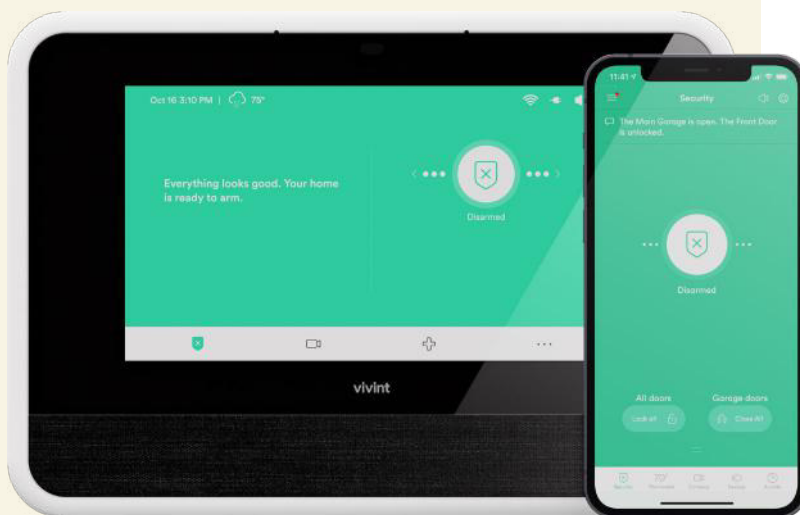


Trex Augmented Reality (AR) Deck Visualizer

Homeowners and contractors who plan to add or replace a deck can now see what it looks like before a hammer is raised. The *Trex Augmented Reality (AR) Deck Visualizer* tool enables users to design their dream space directly from their yard or living room utilizing realistic digital Trex product renderings. The app also allows users to specify and even purchase select products right from their mobile devices.

The interactive program features planning tools to determine size/square footage and estimate material needs. A materials list with on-screen buttons takes users to the Shop Trex website, where they can order product samples. Consumers can email selections to themselves, making for easy conversations with contractors when the time comes to build. Homeowners can also order product samples, find local Trex retailers and research builders within the application. The app is free from iTunes and Google Play.

FOR MORE INFORMATION: [TREX.COM](https://www.trex.com)



Vivint Smart Hub security system

Vivint's *Smart Hub* is a touchscreen control center that allows users multiple control points: They can answer the door, arm the system, view security camera video or even dial for emergency aid with the touch of a finger. The system can also handle everyday actions such as locking the doors, adjusting a thermostat, turning lights on or off, monitoring carbon monoxide level, controlling indoor motion sensors, and more.

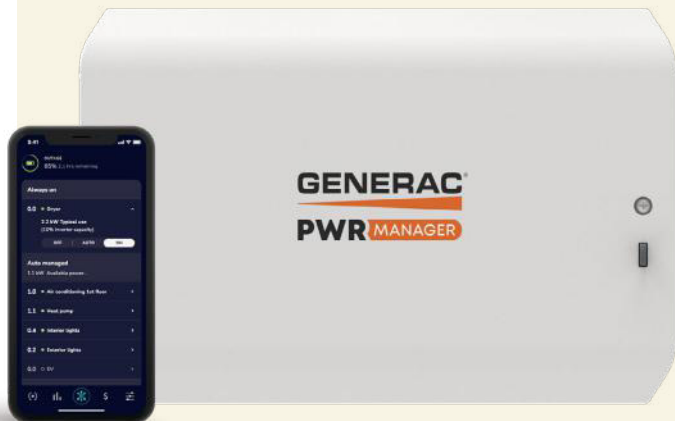
These options can also be handled with the Smart Hub app, allowing homeowners to manage the various aspects of the system with a smartphone.

The *Smart Hub* encrypts smart home signals, keeping devices, cameras and recordings safe from online security breaches. A 24-hour backup battery and cellular connectivity power the unit during outages, and keep internet service active. There is also 24/7 customer support provided.

FOR MORE INFORMATION: [VIVINT.COM](https://www.vivint.com)



Solar



Generac Power Systems *PWRmanager*

Generac Power Systems' *PWRmanager* is a solar energy-optimization product that enables homeowners to run their entire home as long as possible on power stored in a battery. The unit automatically controls and sequences which circuits and appliances receive power when the home is disconnected from the grid in a power outage. *PWRmanager* also enables the home to be powered with fewer batteries.

Homeowners can use their smartphone or tablet to simply swipe off/on any circuits in their home.

The product does not require a new load panel. Rather, it installs next to the home's existing electrical panel in as little as 90 minutes. Additionally, *PWRmanager* integrates seamlessly with Generac's *PWRcell* system and *PWRview* app. *PWRmanager* automates control up to one dozen 120-volt circuits or six 240V circuits, plus two thermostats.

FOR MORE INFORMATION: [GENERAC.COM](https://www.generac.com)

Kohler *Power Reserve* energy storage system

Kohler's new *Power Reserve* energy storage system offers customers a modular backup unit to store and access the clean energy produced by their home's solar systems. Homeowners can access and manage the stored solar power through an intuitive app that provides insights into real-time power flow for the home, timeline of power information for the day, and historical statistics for the system.

For non-solar powered homes, the *Power Reserve* offers a way to store energy from the grid during times of lower rates and then rely on battery power during peak rate periods, while providing the home with backup power in case of a power outage.

Kohler offers AC- and DC-coupled units, allowing installers and dealers to service customers with a single, reliable brand, and for users to access the power source/output required for their homes without purchasing additional accessories.

FOR MORE INFORMATION: [KOHLER.COM](https://www.kohler.com)

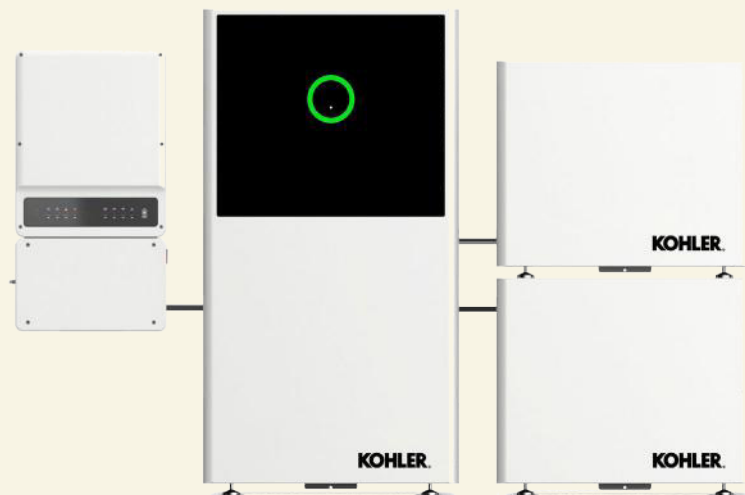


GAF Energy *Timberline Solar Energy Shingle*

More than 75 percent of U.S. homes have asphalt shingles, most of which eventually end up in a landfill. GAF Energy has developed what it hopes is a solution: the *Timberline Solar Energy Shingle* (ES), which integrates solar technology into existing roofing processes and materials. Why not upgrade that next roof replacement to a solar roof? ES, which can be nailed in like a regular shingle, is less than a quarter-inch thick and integrates with traditional shingles, to create a sleek and attractive look.

In September 2021, the Timberline Solar system achieved UL's 7103 certification, which authorizes GAF Energy to install the system as a residential roofing product and a solar energy product—the first of its kind to be recognized as both. In addition, GAF Energy worked with Sandia National Laboratories, a U.S. Department of Energy research and development lab, to verify the product's strength, durability, and overall market-readiness.

FOR MORE INFORMATION: [GAF.ENERGY](https://www.gaf.energy)





Panasonic Life Solutions *EverVolt 2.0* battery storage system

Panasonic's new outdoor-rated and weatherproof *EverVolt 2.0* battery storage system collects and stores surplus power produced by solar panels during the day. Sporting a smaller, sleeker modular design, *EverVolt 2.0* gives homeowners a private energy store that protects them from power failures and peak demand energy rates. And, there are zero carbon emissions.

EverVolt 2.0, the next generation of Panasonic's popular *EverVolt Home Battery*, provides a continuous power output of 7.6 kilowatts (kW) off-grid and 9.6 kW with grid, enough to power most homes. It has a storage capacity range of 17.1 to 25.65 kilowatt hours (kWh) and can be AC- and DC-coupled to work with new and existing solar systems.

Operating modes include back-up, residential, time-of-use, and custom, which can be set by the system owner. A new user-friendly mobile app allows homeowners to monitor system data and set the operating mode.

FOR MORE INFORMATION: NA.PANASONIC.COM/US



JinkoSolar *Eagle RS* residential energy storage system

JinkoSolar's *Eagle RS* is a fully integrated, DC-coupled residential battery energy storage system that is an all-in-one option for proper energy management. Offering 7.6 kilowatts and 26.2 kilowatt hours of power, the system's key features include an integrated automatic transfer switch with an autotransformer to allow worry-free operation during power outages when linked with solar. A robust battery management system (BMS) offers increased safety, faster charge capability, decreased fire potential, and improved cell life.

The system's batteries are UL 9540 certified, and are IP55/65 and NEMA 4 outdoor rated. They are in separate cabinets to allow for flexible installations whether floor or wall mounted. A lithium iron phosphate (LFP) chemistry offers ultra-safe device storage capability; a *Tigo RSS Transmitter* provides rapid shutdown when needed. A U.S.-based monitoring app that is Android and iOS compatible allows installers and end users to track system production.

FOR MORE INFORMATION: JINKOSOLAR.US



Ubiquitous Energy *UE Power* solar window coating

Photovoltaic (PV) cells absorb sunlight and convert it into electricity, resulting in clean, renewable energy. But conventional solar cells are opaque, which limits their use to a few specific applications, such as rooftop solar systems or large solar farms. Solar technology developer Ubiquitous Energy (UE) spent a decade creating an alternative, and the result is a highly transparent, color-neutral PV window coating that draws solar energy from glass surfaces to generate electricity.

The on-board power platform seamlessly integrates with other smart devices and electronics throughout the home, as well as other solar technology. Meanwhile, *UE Power* maintains complete continuity with traditional residential windows in terms of visual aesthetic and low-E functionality. The product can be applied using standard glass coating equipment.

Window and door manufacturer Andersen Corporation recently became a funding partner, to further UE's efforts at advancing solar window technology. Thus far, the company has test-installed coated windows at locations in Colorado, Michigan and Japan.

FOR MORE INFORMATION: UBIQUITOUS.ENERGY.COM



Blue Tiger *Solare* solar-powered communications headset

For those who need to stay in constant contact with others while working on site or driving, Bluetooth headset maker Blue Tiger U.S.A. has released its *Solare* solar powered communications headset. The product is powered by indoor or outdoor light and is continuously self-charging, eliminating concern about battery life. The headset is ideal for truckers, professional drivers, commuters, customer service reps, office professionals and more.

Solare provides 97 percent noise canceling, can operate at minus 40 degrees to 122 degrees Fahrenheit, and uses Bluetooth 5.1 with a range of 300 feet. It's compatible with *Siri* and *Google Assistant*. The headset meets the MIL-STD-810 military specification for ruggedness in extreme environments, according to the company.

The headset uses a Powerfoyle solar cell headband as its charging tool. The same item is used by cyclists to power lights in biking helmets.

FOR MORE INFORMATION: BLUETIGERHEADSETS.COM



Specialty Items

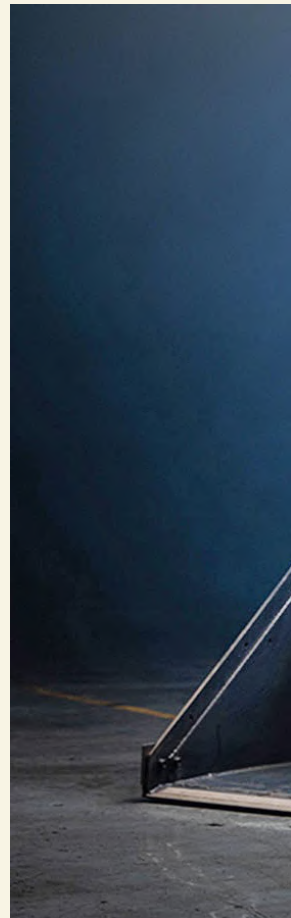


Navien *PeakFlow A* scale prevention system

Calcite—the rock-hard scale seen inside pipes and boilers, and on heating elements—is an arch nemesis to heat exchangers. Too much buildup lowers heat transfer rates and hinders water flow. Water heater manufacturer Navien's chemical-free and environmentally friendly system, *PeakFlow A* (advanced), keeps that problem in check. *PeakFlow A* transforms potential hard scale buildup into soft scale aragonite and vaterite that can easily be rinsed out with water flow.

With a maximum flow rate of 10 gallons per minute (GPM), *PeakFlow A* can be used for residential or light commercial applications. This advanced system can be installed at the main water line to prevent scale for the entire water supply, or at the cold water inlet line just before a tankless water heater or combi-boiler. *PeakFlow* is also available in S (standard, 6 gpm) and C (commercial, 20 gpm) versions.

FOR MORE INFORMATION: NAVIENTINC.COM



Toter *EVR-Green* recycled waste container

It sounds strange, but the thing people use for curbside recycled waste isn't made of recycled materials—until now. Waste container maker Toter has unveiled *EVR-Green*, the first two-wheeled molded trash can with a 100 percent recycled body. The product, manufactured with various recycled materials and entirely without virgin resin, is also fully recyclable—another industry first.

The industry's most sustainable cart is also one of the most durable: *EVR-Green* is built with Toter's *Advance Rotational Molding* process, and passes the same rigorous testing as the brand's traditional EVR carts. The roto-molded design optimizes *EVR-Green*'s superior impact strength and performance. It also eliminates the built-in stress, weakness and brittleness associated with injection-molded waste receptacles typically found in the marketplace.

The *EVR-Green*'s lids and wheels will initially contain some recycled content. Toter plans to offer these in fully recycled form in the near future.

FOR MORE INFORMATION: [TOTER.COM](https://www.toter.com)



Bobcat *T7X* all-electric compact track loader

A key construction tool has just gone all-electric. Doosan Bobcat's *T7X* compact track loader is the first of its kind to run entirely on lithium-ion battery power. The *Bobcat T7X* operates with zero emissions, reduced sound levels, limited vibrations and lower daily operating costs, and is generally more powerful than any diesel-fueled track loader currently in use.

The traditional hydraulic work group has been replaced with a drive system of electric cylinders and electric drive motors, which means virtually no environmentally hazardous fluids in use. Each charge of the 62-kilowatt lithium-ion battery can support up to four hours of continuous operation time.

The *T7X* is also a smart machine featuring software connectivity via two-way telematics communications. The platform provides information about the machine's performance, along with operator-focused data, to change machine preferences, tune the performance to certain job situations and upgrade product features.

FOR MORE INFORMATION: [BOBCAT.COM](https://www.bobcat.com)





Ventilation



Broan-NuTone *Overture* fully automated fresh air system

Broan-NuTone's *Overture* is a fully automated fresh air system that uses sensor technology in the form of smart wall controls and smart room sensors, to continuously monitor pollutants. When it detects a rise in indoor air pollution, caused by increased humidity, VOCs, smoke, carbon dioxide or small particles (PM2.5), the system automatically activates the nearest Broan-NuTone or BEST ventilation fan or range hood to remove the pollutant and bring in clean air via a system connected to a smart plug.

Overture can also be set up and controlled from a mobile device. The *Overture* app provides live feedback on a home's current indoor air quality level, gives a live look into any room with an *Overture* sensor or wall control, and provides a review of historical data.

FOR MORE INFORMATION: BROAN-NUTONE.COM

Panasonic *Intelli-Balance 200* energy recovery ventilator

Tightly built homes and buildings utilizing exhaust only fans can create negative pressure. Panasonic's *Intelli-Balance 200* energy recovery ventilator (ERV) solves this, by allowing the installer to adjust supply air to replace exhausted air, helping to balance air pressure within the home.

The *Intelli-Balance 200*'s low speed, continuous run setting helps remove moist, stale air and replace it with fresh air. The unit has a built-in multi-speed selector that provides the ability to select the required supply and exhaust airflow with the turn of a dial.

Intelli-Balance 200 can be floor, or be wall or ceiling mounted, and does not require connection to the central HVAC or the addition of a condensation line. This allows it to be installed in many places throughout the home to meet space and design requirements. The unit meets whole house ventilation requirements under ASHRAE 62.2.

FOR MORE INFORMATION: NA.PANASONIC.COM



Honeywell Smart Wi-Fi Energy Star Dehumidifier

Dehumidifiers have their benefits: They can relieve illnesses, keep skin moist, and even extend the lives of furniture, floors and walls. Honeywell covers those bases with its *Smart Wi-Fi Energy Star Dehumidifier*, which removes moisture with less energy than conventional dehumidifiers, saving energy costs. This unit removes up to 30 pints of moisture daily from medium to large rooms. A continuous drain option allows constant removal of condensate water for long unattended operation. A digital humidistat control system automatically senses room moisture levels and activates dehumidification to accurately maintain desired humidity levels.

With Wi-Fi connected with Amazon *Alexa* voice control, a user can monitor the home's humidity from almost anywhere. It is compatible with Apple iOS 9.0 or later, and Android version 4.3 or later. A 2.5 GHz Wi-Fi connection is required to operate the product's *Smart Dehumidifier* app and remote features.

FOR MORE INFORMATION: HONEYWELLHOME.COM



GREEN BUILDER[®] BRAND INDEX 2022

New winners, new losers, as manufacturers jostled to control the sustainable high ground.

BY GREEN BUILDER STAFF

In this year of anxiety and change, the public's mental space shifted in unpredictable ways. Their attitude toward housing overall, toward "green" living, opened some doors and slammed shut others for manufacturers.

To arrive at a fair estimate of a given brand's perceived "value" in the market, we combined three metrics: survey data, public sentiment and market visibility or "mentions." We weighted and averaged these scores to arrive at a company's comparative rank.

A few big-name players fell behind, not even making the top five within their category, while other, lesser-known companies hit the brand heights for the first time. Sometimes the reasons are clear. In other cases, it's anybody's guess.

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, relative to other companies on our list.



MENTIONS

Ranking in terms of number of positive mentions by customers who have used or have heard about the product, or resulting from product marketing.

Ranking in terms of how favorably consumers see the company.



SENTIMENT

NOTES

*If a sequential number 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.

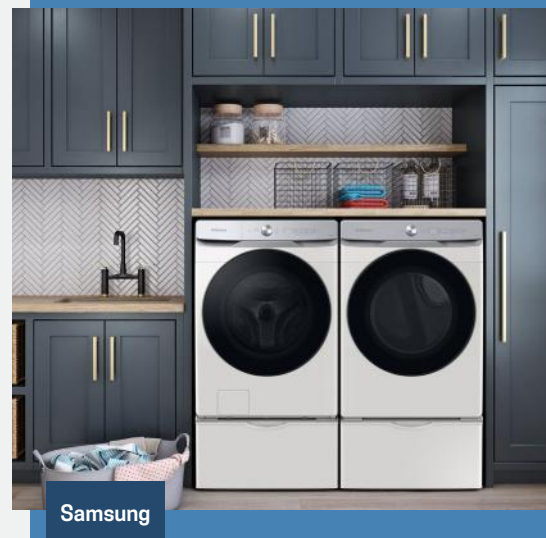
A.O. Smith	Forbo	Nudura
Accoya	Ford	NuWool
Acuity	Formica	Omega Stucco
Ainsworth	Fortifiber (WeatherSmart)	Orro
Air King	Fox Blocks	OutBack Power
Alarm.com	Fronius	Owens Corning (PINKWRAP)
Allura	GAF	Panasonic
Amazon	GE Lighting	Panda
American Standard	Geberit	PaperStone
American Woodmark	Generac	Pella
AMICO (HYDRODRY)	Generation Lighting	Pfister
Amvic	Gerber	PGT Innovations (Western Window Systems)
Andersen	Glidden	Philips
Apple	GMC	Plastpro
Applegate Insulation	GoodWe	Ply Gem
Aprilaire	Google	PPG (Olympic)
Armstrong	GP (ForceField)	Premier Building Systems
Atlas Roofing	Green Bay Decking	Pro Via
AZEK TimberTech	Greenfiber	Progress Lighting (Hubbell)
BASF	Greenheck	ProVia
Behr	Grohe	Quaker
Beko	Haier (Haier, GE, Café, FisherPaykel, Monogram)	R-Control
Belkin	Hansgrohe	RenewAire
Benjamin Moore	Hanwha Q Cells	Resideo (Honeywell Home)
Benjamin Obdyke (HydroGap)	Hanwha Surfaces (HanStone)	Resysta (TruGrain)
Boise Cascade	Huber (Zip System)	Rheem
Boral	Hutsman Building Solutions	Rinnai
Boral Roofing	IceStone	Rockwool
Bosch (Bosch, Gaggenau, Thermador)	iDevices	ROMABIO
Bradford White	IEA	Roseberg Forest Products
Brilliant	Insulfoam	Royal
Broan-NuTone	Interface	S&P USA Ventilation Systems
BuildBlock	James Hardie	Samsung (Samsung, Dacor)
Cabinetworks Group (ACPI, Advanta Cabinets, Echelon Cabinetry)	JELD-WEN	Samsung (SmartThings)
Caesarstone	JinkoSolar	Savant
Cal Bamboo	Johns Manville	Savoy House
CalStar	K2 Stone	Schneider Electric
Cambia by NFP	Katerra	Sensi
Cambria	Keene (Driwall)	Sharp
CanadianSolar	Kelly Moore	Shaw
Carlisle Polyurethane Systems/SealTite (formerly Accella/Bayseal/Foamsulate, and QuadFoam)	Kichler	Sherwin-Williams
Carrier	Kimberly-Clark (BLOCK-IT)	Sierra Pacific
Ceramica Floranese (Ceramic Tiles of Italy)	Kingspan (formerly Pactiv)	Simonton
CertainTeed	KlipTech "EcoClad"	Simpson
CertainTeed "Cedarboards"	Knauf	Simpson Strong Tie
CertainTeed EverNew	Kohler	SMA
Chevy	Kolbe	SolarEdge
Clare Controls	KraftMaid	Sonnen
ClimateMaster	LaHabra	Stiebel Eltron
ConnectSense	Lapitec	Sto (StoGuard)
Control4/Snap AV	Lauzon	SubZero/Wolf
Cosella Dorken (Delta Dry)	Ledvance	SunPower
Cosentino (Eco, Dekton)	Lennox	SunRun
Creative Mines	Leviton	SWD
CREE	LG	Sylvania
Crossville Tile	LG (Signature Kitchen Suite)	Systemair (Fantech)
Crystal	Liebherr	Takagi
Culture Stone	Loewen	TAMKO
Custom-Bilt Metals	Logix	TAMKO Envision
Daikin (Goodman)	Lotte	Tesla
DaVinci	Loxone	Tesla (SolarCity)
Decra	LP Building Solutions (LP SmartSide)	Therma-Tru
Delta (Brizo)	Ludowici	Thomas
Delta Breez	Lutron	Tiles of Italy
Delta Electronics	Lux	TOTO
Delta Millworks	LX Hausys (Viatera)	Toyota
Dodge RAM	mafi	TP-Link
Dow	Marazzi	Trane (RunTru / American Standard)
Dryvit	Marvin	Tremco (Enviro-Dri)
Dunn Edwards	Masonite	Trespa
DuPont (Tyvek HomeWrap, Weathermate)	MasterBrand	Trex
DuPont Surfaces (Corian / Zodiaq)	MaxiTile	TruStile
Eaton Lighting (Halo)	Mercedes-Benz	Typar (HouseWrap)
ecobee	Meridian	UPF (Deckorators / Veranda)
ECOS	Merillat	Unico
EcoStar	MI Windows & Doors	Uponor
EDCO	Miele	Valspar
Eldorado Stone	Milgard	Vetrazzo
Electrolux (Electrolux, Frigidaire, WhiteWestinghouse)	Milliken	Viance
Enphase	MITek	Viking
EnviroShake	Mitsubishi Electric	Vine
Etekcity	Modern Mill	WaterFurnace
Euroline Windows	Moen	Weather Shield
Eurotek	Mohawk	Weil McLain
Executive Cabinets	MoistureShield	Wellborn
Fabral	MSI	WEMO
Fiberon	Mullican	Weyerhaeuser (Trus Joist)
First Solar	Navien	Whirlpool (Whirlpool, Jenn-Air, Amana, KitchenAid, Maytag)
	NCFI (InsulStar)	Wilsonart
	Neolith	Windsor
	Nest	Wood-Mode
	Niagara	Wyze
	Nichia	York
	Nissan	Zehnder
	Nobilis	Zola
	Norbord	Zuri (Royal)
	Nortek	
	Nortek/Elan	

APPLIANCES

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Samsung (Samsung, Dacor)	1.60	2	1	1
2	LG (Signature Kitchen Suite)	1.70	1	2	3
3	Whirlpool (Whirlpool, JennAir, Amana, KitchenAid, Maytag)	3.40	4	4	2
4	Bosch (Bosch, Gaggenau, Thermador)	4.40	3	5	7
5	Miele	6.50	5	8	9
6	Electrolux (Electrolux, Frigidaire, White-Westinghouse)	6.60	7	6	6
7	Haier (Haier, GE, Café, Fisher & Paykel, Monogram)	7.20	9	3	5
8	SubZero/Wolf	7.30	6	7	10
9	Liebherr	8.30	8	11	8
10	Beko	8.80	11	10	4

HIGH RISE

Samsung has been fine tuning itself in recent years, moving from seventh in 2019, to fourth in 2020, to No. 1 overall last year. The company's appliance brands now compete aggressively with long-time favorites LG and Whirlpool.



BACK TO THE TOP

After several years in the top three, DuPont moves to the No. 1 spot, slightly ahead of Cosella Dorken, and way above everyone else. Owens Corning, the 2020 winner, lost popularity among the general public but remains a favorite with current customers.

BUILDING WRAP

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	DuPont (Tyvek HomeWrap)	3.1	2	4	5
2	Cosella Dorken (DELTA-DRY)	3.3	2	15	2
3	Sto Corp (StoGuard)	5.3	6	14	1
3	Benjamin Obdyke (HydroGap)	5.4	4	12	6
3	Kimberly-Clark (BLOCK-IT)	5.5	1	13	12
6	Owens Corning (PINKWRAP)	6.1	5	1	10
7	GP (ForceField)	7	9	7	3
8	Fortifiber (WeatherSmart)	7	6	16	6
9	CertainTeed	8.1	9	3	8
10	AMICO (HYDRODRY)	9.5	6	11	16



DuPont



NOW NO. 1

Few cabinetmakers can lay claim to an exceptionally IAQ-friendly cabinetry, but until this year, IKEA told a more convincing story. With a new leader in the brand space, perhaps we'll see some real material change.

CABINETS AND SHELVING

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Cabinetworks Group (Advanta, Echelon Cabinetry)	2.2	1	4	4
2	IKEA	2.3	3	1	2
3	American Woodmark	2.7	2	3	6
4	MasterBrand	4.8	4	5	9
5	Crystal	5.6	7	2	8
6	KraftMaid	6.1	6	6	7
7	Wood-Mode	6.1	5	7	10
8	Merillat	7.2	7	9	3
9	Wellborn	8.5	10	8	1
10	Executive Cabinets	8.6	7	11	11

COUNTERTOPS

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	DuPont Surfaces (Corian/Zodiaq)	2.4	1	4	6
2	Caesarstone	2.7	2	2	9
3	Cosentino (Eco, Dekton)	4	3	3	13
4	Wilsonart	5.3	5	5	8
5	Hanwha Surfaces (HanStone)	8.1	7	9	12
6	Vetrazzo	8.4	8	11	3
7	Cambria	8.4	4	15	15
8	Neolith	8.6	9	7	11
8	Lotte	8.6	9	10	2
10	Lapitec	8.6	5	14	14



DuPont Surfaces

EVOLVING CHEMISTRY

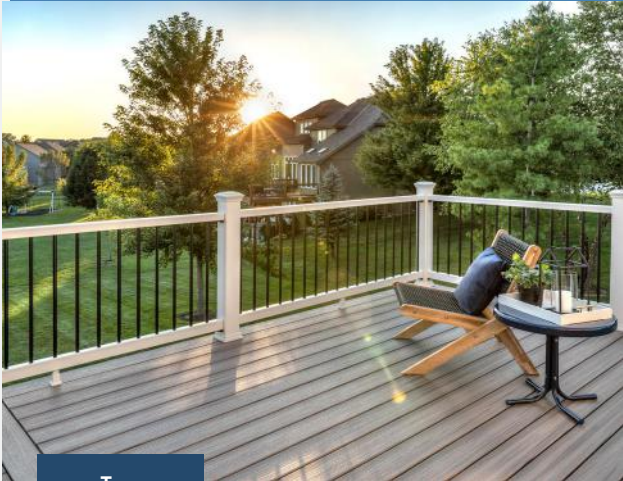
For the fourth time in five years, DuPont Surfaces is perceived as a sustainable choice. Some green messaging is getting through, however. Notably, Caesarstone, Cosentino and Cambria's more eco-friendly products made the top 10.

DECKING

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Trex	1.2	1	1	3
2	MoistureShield	3.7	3	5	4
3	UFP (Deckorators/Veranda)	4.3	3	7	4
4	Green Bay Decking	5	2	8	14
5	AZEK (TimberTech)	5.1	6	3	6
6	CertainTeed EverNew	6.2	8	2	8
7	TAMKO Envision	6.7	6	6	13
8	Viance	6.9	3	14	9
9	Resysta (TruGrain)	8.8	8	13	1
10	Accoya	9.2	10	10	2

RECYCLING (STILL) MATTERS

Trex hung on to its well-deserved rank at the top of sustainable decking brands. But other composites are not far behind. The cluster of composites in the top 10 hints at a growing brand awareness about the eco-advantages of recycled and durable deck materials.



Trex

DOORS

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Therma-Tru	1.4	1	2	2
2	Simpson	2.2	2	3	1
3	ProVia	3	4	1	3
4	Masonite	3.5	3	4	5
5	Plastpro	5.2	5	6	4
6	TruStile	5.7	6	5	6



Therma-Tru

“TRU” FEELINGS

Therma-Tru continues its dominance among door makers, finishing atop our survey for a fourth straight year. That company notably continues to raise the bar on its architectural looks, yet offers well-insulated, durable products. Simpson’s solid wood line also hits the right sustainability notes.



Armstrong

HOLDING THEIR GROUND

Armstrong and Mohawk remain at the top, with the former taking the No. 1 spot for the third time since 2018. The public images of other brands, however, need work. Top five regulars Cali Bamboo and Shaw still lag behind the big brands in terms of overall sentiment and loyalty from the public.

FLOORING

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Armstrong	2.3	1	2	11
2	Mohawk	4.7	5	3	8
3	Forbo	4.7	3	5	14
4	Ceramica Fioranese (Ceramic Tiles of Italy)	5.2	2	13	1
5	Interface	5.5	5	4	13
6	Crossville Tile	5.9	4	10	5
7	Marazzi	7.2	7	7	9
8	Milliken	7.8	8	6	12
9	Lauzon	8.4	8	11	3
10	mafi	8.6	8	12	2

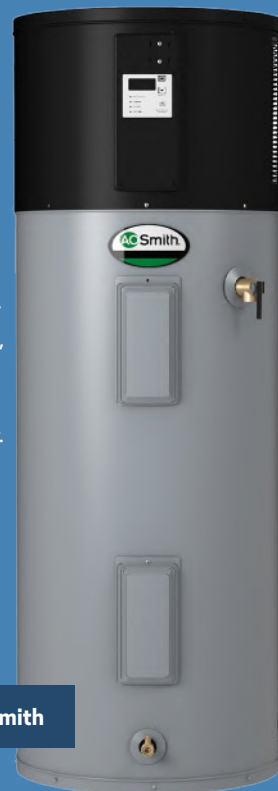
HOT WATER SYSTEMS

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	A.O. Smith	1.6	1	2	4
1	Bradford White	3.5	4	1	8
3	Rheem	4.2	5	3	3
4	Stiebel Eltron	4.3	2	8	7
5	Takagi	5	3	9	5
6	Rinnai	5.7	6	5	6
7	Navien	6.7	8	6	1
8	Bosch	6.8	9	4	2
9	Noritz	7.2	7	7	9

HOT TOPIC

After sharing the No. 1 slot with Rheem last year, A.O. Smith got the positive word out and pulled away from the field. Rheem, now third, is still a prominent force, as is runner-up Bradford White, which typically has been middle of the pack until this year.

A.O. Smith



HVAC

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Trane (RunTru/American Standard)	2.3	2	2	5
2	LG	3.2	3	4	2
3	Bosch	3.5	1	6	11
4	Lennox	4.8	4	5	9
5	Rheem	5.2	4	7	7
6	York	6.7	4	13	4
7	Carrier	7.5	11	1	6
8	Panasonic	8.1	9	8	3
9	Uponor	9.4	10	11	1
10	ClimateMaster	9.8	7	14	14

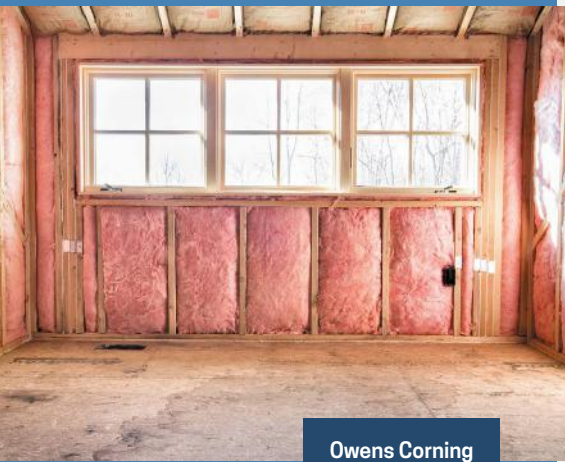


HEAT PUMP HEROICS

Trane returned to the top after being knocked down to second place last year, although it only had to maintain its market share to do so. The competition shuffled around from 2020 standings, as manufacturers jostled to tell their building science success stories with regard to product performance.

RIISING ABOVE THE FRAY

Owens Corning managed to keep people thinking pink, and for the rest of the field it was pretty much business as usual in 2021. But that’s not necessarily good news: Some top finishers did well in Green Builder’s survey, but still encountered high levels of negative commentary online.



Owens Corning

INSULATION

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Owens Corning	2.8	2	2	10
2	BASF	4.4	3	4	14
3	Greenfiber	4.5	1	12	3
4	Johns Manville	4.8	3	5	15
5	Carlisle Polyurethane Systems/SealTite (formerly Accella/Bayseal/Foamsulate, and QuadFoam)	5.3	3	10	5
6	Knauf	6.9	8	3	12
7	Huntsman Building Solutions	8.2	8	9	7
8	CertainTeed	8.5	8	8	13
9	Insulfoam	9	7	13	9
10	Applegate Insulation	9.4	8	14	4

CONTROLLING INTEREST?

How do lighting companies become associated with sustainability? Ask Eaton Lighting. Perhaps it's a public announcement of sustainability goals. Or is it simply familiarity with lighting controls and systems? The folks at Philips and GE may want to dive deeper into this brand loyalty question.



Eaton Lighting

LIGHTING

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Eaton Lighting <i>(Halo)</i>	1.7	1	1	8
2	Philips	2.8	2	4	4
3	GE Lighting	4.3	3	5	10
4	Thomas	5.3	7	3	2
5	Sylvania	5.4	4	8	6
6	Acuity	6.1	5	6	13
7	Progress Lighting <i>(Hubbell)</i>	6.3	8	2	9
8	Kichler	7.2	5	10	12
9	Loxone	9.4	9	13	1
10	Generation Lighting	9.8	11	9	5

PAINT AND COATING

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Sherwin-Williams	1.5	1	2	3
2	Behr	2.8	2	5	1
3	PPG <i>(Olympic)</i>	3.4	4	1	7
4	Benjamin Moore	3.5	4	3	2
5	ECOS	4	3	6	4
6	Valspar	6.3	7	4	9
7	Dunn Edwards	6.8	6	8	8
8	Glidden	8	9	7	5
9	Kelly Moore	8.4	8	10	6
10	ROMABIO	9.7	10	9	10



Sherwin-Williams

FIVE-TIME WINNER

Back at the top for the fifth time in six years, Sherwin-Williams is again the choice of builders and consumers. With almost a 2-to-1 lead over second-place Behr—itself a much more popular product maker than in years past—it's Sherwin-Williams' market to lose. At the moment, that seems unlikely.

PHOTOVOLTAIC SYSTEMS

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Tesla <i>(SolarCity)</i>	2.1	2	1	6
2	First Solar	3.5	4	2	5
3	LG	3.5	1	9	2
4	Panasonic	4.6	3	8	4
5	SunPower	4.8	6	3	3
6	CertainTeed	6.4	4	10	10
7	JinkoSolar	7	8	5	7
8	SunRun	7.3	9	6	1
9	Hanwha Q Cells	8	6	11	11
10	CanadianSolar	8.7	11	4	9



POWERING UP

Repeat champion Tesla—a top two finisher for the seventh straight year—maintained its lead in the public's imagination, despite the low market penetration of building integrated photovoltaics (BIPV). Other companies with new, advanced tech panels, such as JinkoSolar and Panasonic, are on the rise.

TRIUMPHANT RETURN

After missing the top 10 in 2020, Niagara's consistent green messaging pushed it all the way to the top this year. Almost everyone else dropped a notch or two as their overall popularity slipped. Hansgrohe was an exception, with a sustainability story that clearly resonated.



PLUMBING

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Niagara	1.7	1	3	2
2	Kohler	2.5	3	2	1
3	American Standard	4.2	3	6	6
3	Hansgrohe	4.2	2	9	3
5	TOTO	4.7	5	4	5
6	Moen	5.3	7	1	8
7	Grohe	6.7	7	7	4
8	Geberit	8.1	7	10	9
9	Delta <i>(Brizo)</i>	8.9	8	8	11
10	Gerber	9.1	11	5	10

RESILIENCE FOR THE WIN

It's no surprise, in this age of wildfires and extreme heat, that a concrete/clay tile manufacturer—Boral Roofing—would take the top brand space. But durability and resilience compete closely with conventional products for loyalty in this category.



Boral Roofing

ROOFING

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Boral Roofing	2.9	1	6	5
2	Atlas Roofing	3.4	2	3	13
3	Owens Corning	3.7	4	2	7
4	EcoStar	6.6	3	11	15
5	TAMKO	7.1	7	7	8
6	Decra	7.1	6	8	11
7	Custom-Bilt Metals	7.5	5	12	9
8	CertainTeed	7.8	10	4	6
9	Ludowici	8.3	7	9	14
10	GAF	8.5	13	1	4

SIDING

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	LP Building Solutions <i>(LP SmartSide)</i>	2	1	1	11
2	James Hardie	3	3	2	6
3	K2 Stone	5.4	6	5	3
4	Eldorado Stone	5.8	3	9	13
5	Boral	6.7	7	3	16
6	Accoya	8.5	7	12	7
7	Sto	8.5	7	14	1
8	CertainTeed <i>(Cedarboards)</i>	8.7	11	4	9
9	Omega Stucco	9.9	2	22	21
10	Nichiha	10.7	11	7	20
10	Creative Mines	10.7	5	20	17



LP Building Solutions

CHANGING OF THE GUARD

Last year's survey showed a growing unhappiness among the public toward siding makers. This year, five new companies made the top 10 list. Stalwarts LP Building Solutions and James Hardie remain at the top, thanks to a growing industry respect and better marketing. But after that, it's anyone's game.

SMART HOME TECHNOLOGY

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Amazon	1.4	1	1	5
2	Apple	3	2	3	9
3	Samsung (SmartThings)	3.2	4	2	2
4	Google	3.6	3	4	6
5	Control4/Snap AV	5.6	5	6	8
6	Leviton	7.8	6	10	12
7	Brilliant	7.9	7	12	1
8	Nortek/Elan	8.5	9	9	4
9	Alarm.com	8.8	9	7	13
10	Belkin	9.6	11	8	6



Amazon

WEB OVERLORD

Smart tech giant Amazon grew even bigger in 2021, as people continued to turn to online shopping. The seven-time winner is the first choice of builders and consumers, and has significantly improved its image since 2020. Or, perhaps people are more tolerant, given that face-to-face interaction and sales tactics are not part of ordering off the web.

POWERING FORWARD

TP-Link finishes No. 1 in this category, completing its upward trend of the past few years. Perhaps work-at-home living has nudged smart controls toward the mainstream, especially lighting. Note also that Schneider Electric, Orro and Etekcity made the top 10 for the first time.



TP-Link

SMART SWITCH

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	TP-Link	2.7	3	2	3
2	Lutron	3.9	4	3	6
3	Leviton	5	4	6	8
3	Schneider Electric	5	1	11	11
5	WEMO	5.8	7	4	4
6	iDevices	6.7	6	8	7
7	Brilliant	8.5	9	10	1
8	ConnectSense	8.5	8	9	10
9	Orro	8.6	11	5	5
10	Etekcity	9	10	7	9

GOLDEN IDOL?

Despite Elon Musk's regular cadence of controversy, Tesla reclaimed some mental space in the solar storage and tech space in 2021. A 50 percent improvement in overall survey score from 2020 moved it to No. 1. Life in general was good for the top five, as solar took a greater hold on homeowners' lifestyles.



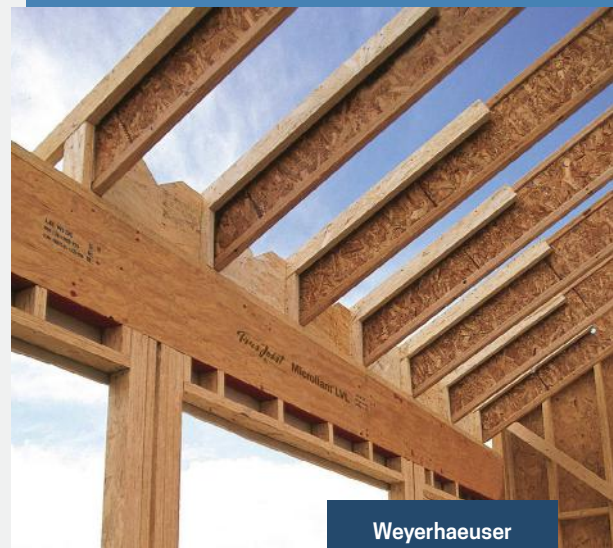
Tesla

SOLAR COMPONENTS

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Tesla	2.1	2	1	6
2	SolarEdge	3.3	4	2	3
3	Delta Electronics	3.5	2	5	8
4	Schneider Electric	5.1	1	12	9
5	Enphase	5.8	8	3	1
6	Generac	6.1	6	6	7
7	OutBack Power	6.8	7	7	5
8	Kohler	6.9	4	11	12
9	SMA	7.1	8	4	11
10	Fronius	8.2	8	8	10

STRUCTURAL

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Weyerhaeuser <i>(Trus Joist)</i>	5.5	2	13	4
2	Simpson Strong-Tie	5.7	1	16	3
3	Premier Building Systems	6.3	3	10	15
3	R-Control	6.3	4	9	12
5	Fox Blocks	6.5	6	5	14
6	Logix	7.9	7	8	13
6	Ainsworth	7.9	5	14	7
8	Katerra	8	7	12	2
9	Nudura	8.2	11	3	7
10	BuildBlock	8.5	9	7	10



Weyerhaeuser

IDENTITY PROBLEMS

What a weird year for structural product makers. Half of the top 10 are new names, led by a well-regarded Simpson Strong-Tie at No. 2. Of the five veterans, only one, Premier Building Systems, maintained its position from 2020. Weyerhaeuser moved up to No. 1. Note also that several returnees suffer marketing and public sentiment problems.

THERMOSTAT

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Nest	1.2	1	1	3
2	Resideo (Honeywell Home)	2.7	2	3	6
3	Bosch	3.5	2	5	8
4	ecobee	3.8	4	4	2
5	Sensi	5.5	5	6	7
6	Carrier	5.9	8	2	5
7	Wyze	7	8	7	1
8	Lux	7.5	7	8	9
9	Schneider Electric	7.6	6	10	10
10	Vine	9.1	10	9	4

LEARNING PREFERRED

With thermostats, when you're right, you're right. Most of 2021's top five has been the same for years. Nest, Resideo and Bosch shuffle places, with Nest on top consistently. ecobee remains a solid choice, while Sensi's upward trend could pop it into the top three next year.



Nest



Panasonic

LOYAL FANS

Except for Greenheck, which debuts here, the 2020 and 2021 lists of top ventilation product makers are the same. Panasonic and Delta Breez are again dueling for No. 1 (Panasonic is 4-0 since 2018), while Broan-NuTone is a solid third-place choice. And Greenheck? Lots of early buzz, but customers are still lukewarm.

VENTILATION

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Panasonic	1.7	1	2	5
2	Delta Breez	2.1	2	1	6
3	Broan-NuTone	3.3	3	4	3
4	Aprilaire	5.2	7	3	1
5	Zehnder	5.6	5	8	2
6	Air King	5.8	6	6	4
7	Systemair (Fantech)	5.8	4	9	7
8	S&P USA Ventilation Systems	7.7	8	7	8
9	Greenheck	8.5	10	5	10
10	RenewAire	8.7	8	10	9



PGT Innovations

UPWARD MOBILITY?

While Andersen continues to be a solid leader in the Windows category—behind PGT and Marvin this year—eyes are focused on Simonton, which entered the top 10 in 2020 and has since moved up to fifth. Its popularity among builders and the general public make it favorable for the top three next year.

WINDOW

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	PGT Innovations <i>(Western Window Systems)</i>	3	1	3	15
2	Marvin	3.3	2	4	9
3	Andersen	3.9	3	1	18
4	JELD-WEN	4.3	3	6	7
5	Simonton	4.6	3	9	1
6	Pella	6.8	7	5	11
7	MI Windows & Doors	7.4	6	8	14
8	Milgard	8.1	8	7	12
9	ProVia	9.8	15	2	2
10	Weather Shield	11	10	15	5

RANK	COMPANY	INDEX AVG	SURVEY DATA	MENTIONS	SENTIMENT
★	Ford	1.3	1	1	4
2	Toyota	2.3	2	2	5
3	Chevy	3.5	4	3	2
4	Nissan	4	3	7	1
5	GMC	5.1	5	6	3
6	Dodge RAM	5.8	6	5	7
7	Mercedes-Benz	5.9	7	4	5

WORK VEHICLE

Ford

ELECTRIC TRUCK BOOST?

For the fifth time in six years—last year’s Mercedes-Benz upset being the exception—Ford and Toyota have taken the top two spots among work vehicles. Ford wins this time, thanks to its new emphasis on electric cars and trucks. But although the two automakers lead in terms of perception, buyers seem to be waiting to test new models in the real world.





Too much of a good thing? An all-electric neighborhood is good for the environment, but the local power grid might not be up to the challenge. CREDIT: HANSENN/ISTOCK

BY MICHELE LERNER

THE “ALL-ELECTRIC” MOVEMENT is amped up these days, as more builders, remodelers and homeowners realize that eliminating natural gas from homes is an effective way to reduce their carbon footprint. Approximately 25 percent of all U.S. homes were run entirely with electricity in 2015, according to the [Energy Information Administration](#). That number is growing, with the recognition of the damaging impact of gas-powered systems and appliances on the planet and on people’s health.

For example, [induction stoves are twice as energy-efficient as gas stoves](#), which saves on utility bills, while reducing carbon output, and they contribute to better indoor air quality. But what happens when a homebuyer or homeowner chooses an electricity-powered heat pump, an electric water heater and electric appliances, then buys an electric vehicle that needs charging? If you’ve looked at an older circuit breaker box in your house, you probably have an idea: Your house may not be up for the challenge.

“We’re working with KB Home to install 200-amp energy control centers in some new home communities that coordinate what would have been three, four or five circuit boxes into one panel,” says Brad Wills, director of strategic customers and programs for Schneider Electric. “These energy control centers can be retrofitted into most homes by an electrician.”

“When you take a household that was cooking with a gas stove and heating water with gas, and convert both to electricity, that’s adding two big new demands on the electric grid.”

A bigger potential electrical storm looms over the future. The possibility of a grid overload is very real when you think of homes across an entire community switching from a mix of power sources to relying solely on electricity. Power grids are regulated by federal, state and local authorities and operated by utility companies that may not have the capacity to quickly upgrade their systems to manage a new heavy reliance on electricity.

“When you take a household that was cooking with a gas stove and heating water with gas, and convert both to electricity, that’s adding two big new demands on the electric grid,” says Wills. “Then if they want to add an electric vehicle (EV) charger, that’s another big load. That home may need a 400-amp panel to manage their electricity.”

Wills notes that existing infrastructure may be in place for one home in a neighborhood to make this conversion. But if multiple homes did this at once, there would definitely be a need to upgrade

THE Electric Conversion CONUNDRUM



As more people embrace an all-electric home, and some jurisdictions ban natural gas in new construction, homeowners and utility companies need to figure out how to manage increased use of electricity.

the infrastructure for the entire community.

“That’s a hidden ‘gotcha’ to upgrading to an all-electric house,” says Wills.

Approximately **\$73 billion** was included in last year’s federal infrastructure bill for upgrades to the power grid to carry more renewable energy, but it can take years for projects to be approved and funded. In the meantime, customers and utility companies will need to adapt their equipment and prepare for future consumption increases.

MANAGING MULTIPLE SOURCES OF POWER

Most existing homes have a circuit breaker box that was set up with the mindset that the home would need one circuit breaker for one source of power, says Wills. The introduction of solar power on homes means that circuit breaker boxes need to handle more than one power source.

“A lot of people with solar panels have been confused, when their power grid went out, that they didn’t have power from their solar panels,” says Wills. “They didn’t realize that their solar power was connected to the grid, and wouldn’t provide electricity unless they had a battery to store the power generated by their panels.”

For homeowners with solar panels and a battery, circuit breakers need to manage three power sources, including electricity from the grid, solar panels and a battery, says Wills.

“If you get a Ford *Lightning* truck with backup power, then that functions like a mobile generator, and that’s another source of power to manage,” Wills says. “You may also have a gasoline-powered generator for emergencies, which would be a fifth power source for your home.”

An **Energy Center** (EC) similar to the ones Schneider Electric is installing in some KB communities includes an all-in-one main panel and backup panel, which is ready to integrate a generator and a battery, Wills says.

“Of course, this is easier to do in new construction or a tear-down, but an [EC] can be retrofitted in an existing home, too,” says Wills. “It just takes more work to prep and repair the wall. Our goal is to have these Centers available in every state by the end of 2022 or early in 2023. The control panels vary according to each utility company.”

In addition, Schneider Electric is developing an EC that is optimized for retrofitting, and would require less surface work to mount.

SMART CONTROLS TO REDUCE ENERGY CONSUMPTION

Switching to an all-electric house is an important step toward reducing a home’s carbon footprint. But ultimately, your goal is probably to reduce your overall use of electricity. An energy control center can be easily connected to your internet to provide

Electric Conversion Blues

Our Scottsdale remodeling project offers a case study view of the growing pains of going all-electric in an existing home.

As part of his plan to modernize and “decarbonize” the ReVISION House Scottsdale, Steve Easley converted the home to all-electric, heating, water heating and induction cooking.

Achieving this, however, raised some unforeseen and potentially widespread roadblocks.

In the ReVISION House remodel, Easley switched gas to heat pumps for space conditioning, water heating and induction cooking. “We have one electric vehicle (EV) in the garage, and a deposit on a second,” he says. “With this scenario, I found that I could not get electrical permits with my existing 200-amp panel. Instead, I had to upgrade to 400 amps to meet my code, which assumes that you are going to be using almost everything at once. Our house is far more energy efficient, and the outdated codes that determine the panel sizing requirements don’t reflect that.”

The fact there are four homes on the same transformer on the street posed a problem. “At first, my utility was doubtful it was large enough to handle all four homes, given my increase to 400 amp service,” Easley says. “They said I would have to pay \$10,000, or possibly more to replace it.”

The utility eventually calculated the transformer loads, and determined Easley did not need an upsized transformer. But the threat still looms. “What if my neighbors want to do the same thing and upgrade to all electric?” he asks. “The clock is clearly ticking, and this is a national issue.”

It’s the last couple miles of distribution that could make wide scale electrification challenging, Easley explains. “With this house, we’ve had to upgrade to 400-amp home service panels,” he notes. “Think about it. You have fully loaded 200-amp panels common across the country. How many will need to be upgraded?”

Some utilities may expect an owner to pay for a new transformer, as well as new service entrance conductors, Easley adds. “I’ve reached out to five large utilities, and a large Midwest co-op, and had discussions with two so far to figure this out,” he says. “But it’s not looking like the utilities are preparing much for electrification, other than to acknowledge it could happen.”

Bottleneck? As homes switch to all-electric, nearby transformers and other equipment may need upgrades or replacement. Who will pay?

CREDIT: ALBERTPEGO/ISTOCK



On the generation side, many utilities are looking to switch to more renewable energy for power generation. “But what are they doing to make your local grid ready for the increased demand, when electrification becomes widespread?” Easley asks.

Apart from uncertainty about who pays for new local wiring infrastructure, most homes that switch over from gas to electric will draw a lot more power, and could need extensive service panel upgrades, he explains. “New construction is not so much an issue, but for the 100 million existing homes it will be. More and more municipalities nationwide are banning gas hookups, and California’s new building standards require single-family homes to be electric ready.”

Easley says utilities must wake up quickly to the change that’s coming. He’s also optimistic that “smart” power management systems can help reduce infrastructure needs. For example, 200 amp panels with 100 amp sub panels with load prioritization technology could work in many applications.

Schneider Electric, and its *Wiser* power management products and smart service entrance panels, have gained Easley’s attention. “[Schneider Electric has] developed smart panels, breakers and other equipment, plus some game-changing artificial intelligence (AI) that can prioritize home energy use and even load shed,” he says. “This means homes could have smaller and less-costly panels, as well as connections to the feeder conductors, transformers. We’re going to need every piece of technology available to make this happen on a grand scale.”



Amped up. Benefits of energy centers, such as the *Square D* model from Schneider Electric, include being able to calculate how many amps of power are consumed if every appliance and system in a home works simultaneously.

CREDIT: SCHNEIDER ELECTRIC

a readout of your total energy use and to display the energy use of individual devices.

According to Willis, people need to understand where they are using their energy in real time to be able to address a problem. Once, while attending a meeting in Las Vegas, Willis got an alert on his smartphone that his refrigerator was working overtime.

“I called my wife and asked if she had left the refrigerator door open,” he recalls. “She thought I had a camera installed in the kitchen, but it was just our Energy Center alerting me.”

You can also set up monitoring for someone else’s house, which could be helpful in allowing elderly parents to age in place. “You can quickly check to see if they’ve turned on their coffeemaker in the morning or turned on lights without the intrusion of a camera,” says Willis.

An EC can calculate how many amps of power are consumed if every appliance and system is working simultaneously, according to Willis. “By giving you insight into which appliances are in use and how much power they’re using, the system can also help you determine what should be shut

“We all know it’s not good if an appliance keeps shutting on and off by itself, but you may not know it without a monitor.”

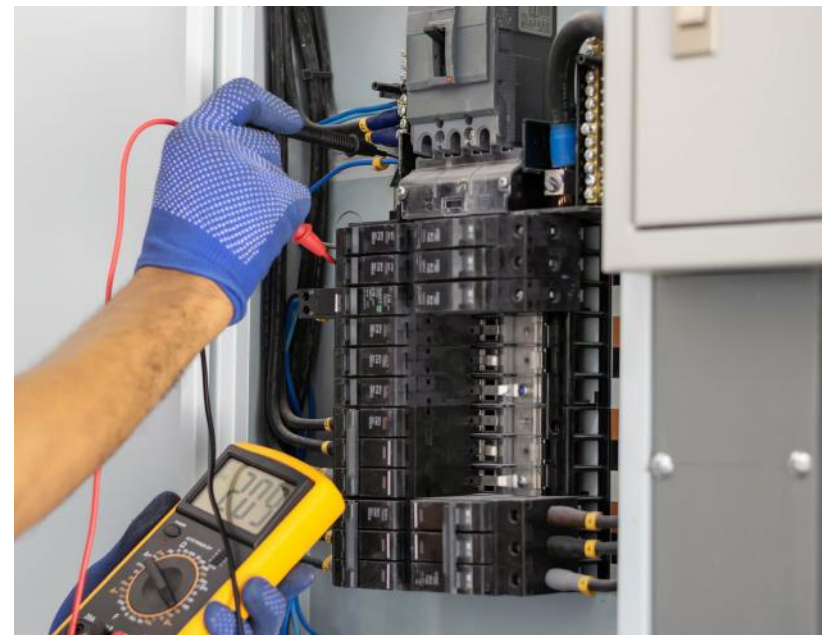
off if you’re close to your capacity limit,” he says.

Monitoring individual appliances and systems can also make it easier to proactively address a potential safety or functional problem. “We all know it’s not good if an appliance keeps shutting on and off by itself, but you may not know it without a monitor,” says Willis. “You can call in your contractor to have something checked out for predictive maintenance.”

Eventually, products will be launched that allow you to schedule your electrical use and control it remotely. For instance, Willis says, if you notice that the electrical outlet where the Xbox is plugged in is getting too much use, you’ll be able to shut off just that outlet.

Typically, installing an EC linked with less than 10 smart devices costs \$1,200 to \$1,500 for the materials, Willis estimates. However, the simplified installation process may save some money compared to an installation of one or more standard circuit breaker boxes.

Over time, Willis anticipates costs will be reduced for the system, which typically happens as new technology is widely adapted. **GB**



High demand. Older homes and most new homes have a circuit breaker box designed to handle only one power source. A fully alternative energy-powered dwelling could require as many as five. CREDIT: WATTANAPHOB/ISTOCK

POWERFUL FUTURE AHEAD FOR Electric Vehicles

Electric vehicles (EVs) are going to be even easier to charge at home in coming years. By 2026, 55 percent of EV-owning households globally will have a home wallbox for charging. That equates to 21 million households, up from 2 million in 2021, according to a report by United Kingdom-based digital technology research firm Juniper Research.

Spending on wallboxes is expected to rise from \$3.4 billion in 2021 to \$16 billion in 2026, largely due to the lower cost and convenience of home charging for EVs versus public charging networks, the firm notes. Meanwhile, revenue from wallbox sales and installs will rise from \$1.8 billion to \$5.5 billion over that five-year period.

"Given the fragmented availability and high costs of public charging networks, the research recommends that home charging vendors and automotive manufacturers form partnerships to make home charging central to future EV transitions," says report author Nick Maynard.

The white paper, "How EV Charging is Driving Electric Mobility Forward," may be downloaded from [Juniper Research's website](#).

EV CHARGING POWER THROUGH TO 2026



35M
HOUSEHOLDES
WILL CHARGE
ELECTRIC
VEHICLES

1BN



TOTAL NUMBER OF EV
CHARGING SESSIONS



55%

OF HOUSEHOLDS WILL
USE PLUG CHARGERS



45%

OF HOUSEHOLDS WILL
USE WALLBOX CHARGERS

KEY CHARGING VENDORS



TESLA

-chargepoint+

ABB



SIEMENS

enel x

Average EV
Vehicle-Owning
Household Spend
on EV charging

\$349
in North
America

\$68
in South
America

\$377
in Europe

\$33
in Africa & the
Middle East

\$678
in Asia

THE GREAT OUTDOORS

The 'Call of the Wild' is more compelling than ever.

THE MAIN DRIVERS FOR AT-HOME FOOD PRODUCTION?



Green thinking. Want to spruce up your garden? Check out *Green Builder Media's* "Return of the Garden" e-book at greenbuildermedia.com/the-return-of-the-garden.



BY SARA GUTTERMAN

HOMEOWNERS ARE SPENDING, on average, 14 hours per week in their outdoor living spaces—up nearly 25 percent from pre-pandemic days. Homeowners value their connection with nature, and they're cooking outside and growing their own food more than ever before.

According to **COGNITION Smart Data**, Green Builder Media's market intelligence division, homeowners have invested big in outdoor living spaces over the past two years.

In an unpredictable and confusing world, homeowners are finding solace in their porches, yards, and gardens. In a recent GBM survey, nearly 75 percent of homeowners responded that their outdoor living areas played an essential role in maintaining peace of mind and a sense of normalcy during the dog days of the pandemic.

COGNITION data shows that decking projects are leading the charge when it comes to outdoor living home improvements. Homeowners are building new decks and replacing old ones to make them attractive spaces for entertaining, working and relaxing.

Manufacturers in the decking sector report an unprecedented demand for composite decking options with ultra low-visibility cable railing as homeowners seek a combination of design, durability and sustainability.

Outside cooking has also surged since the onset of the pandemic, and homeowners are putting their money where their mouths are. According to Realtor.com, homeowners have spent an average of \$13,000 over the past two years to upgrade outdoor kitchens and \$4,000 to enhance outdoor furniture and lighting. Forty percent have also purchased fire pits or outdoor fireplaces.

Sustainable landscaping and **edible gardens** are also on the rise. Nearly 80 percent of COGNITION survey respondents say that they are now growing their own food in backyard gardens, planter boxes, patio pots or rooftop terraces.

Investment in outdoor living is expected to continue through at least 2024 as the housing market remains hot, allowing homeowners an enhanced quality of life, a much-cherished connection with nature, and a higher resale value. **GB**

Where Do We Go

FROM
HERE?

Law abiding citizens. Illinois state legislators are among those who are taking a long, slow look at the 2021 International Energy Conservation Code (IECC) development process and any loopholes that may exist.

CREDIT: DANIEL SCHWEN/WIKIPEDIA

BY MIKE COLLIGNON

Do you ever have a line from a song just pop into your head? I get that a lot. It's probably due to my lifelong love of music. Anyway, while I was researching this column, the title line of "Where Do We Go From Here?" by Filter started playing between my ears. You'll see why in a couple minutes.

In case you didn't [read about it here](#) or elsewhere, the International Energy Conservation Code (IECC) development process has undergone an overhaul. It now follows a standards process but retains the word "code" in the name. The greatly expanded residential committee is now a consensus committee. Proposals are still submitted, reviewed and voted upon by the committee. On the surface, it doesn't sound like much has changed. As they say, the devil is always in the details.

The reason for this overhaul was that in the 2021 IECC development process, the residential energy code made a sizable jump in efficiency. Energy efficiency advocates successfully campaigned governmental voting members to support efficiency

measures...even to the point of approving some proposals that, off the record, they didn't think would get approved. (That's the nature of an open voting process; the final outcome is truly uncertain.) This "running of the table" understandably angered the National Association of Home Builders (NAHB) and its allies, even though an audit found that no rules had been broken. In the fallout, pressure was applied to the International Code Council (ICC)'s Board of Directors from all sides, including NAHB, efficiency advocates and the [U.S. House Committee on Energy and Commerce](#). (The ICC sent a 20-page response to the House Committee, which [can be found here](#).) Public comments on a new code development process were solicited, submitted and [posted to the ICC website](#).

To placate all parties, ICC switched to a standards development process, even though this was counter to the wishes of thousands of ICC's own members. The residential committee was tripled in size, chairs and co-chairs were chosen, subcommittees were created, promises were made...and some have been kept.

Governmental members now make up no more than one-third

of the voting participants, compared to 100 percent previously. They are also 1 of 9 total interest categories, which means they are in the minority. One committee member I interviewed expressed concern about the time commitment. In their estimation, it had increased three-fold, and that made it seem like “the balance of power is now shifted because two-thirds are paid professionals and one-third are code officials.” The implication is that for code officials, this responsibility was in addition to their day jobs, while it was the day job of the paid professionals. So much for it being the governmental members’ code...I mean, standard.

WHAT’S THE DEAL?

Besides stripping governmental members of most of their voting authority, why does this matter? The consensus committee requires a one-third majority to “approve a revision or addendum to part or all of a standard.” In the words of one committee member, “the process has more potential for collaboration, but ICC members no longer have the power they once had.” Another member stated, “the process is designed to make it hard to change” the code/standard.

Just as important as the committee makeup is its scope. It took the committee a couple of months to agree to a Goals statement.

As part of the establishment of the new process, the ICC published a fact sheet comparing the “old” IECC development process to the new standards process. Created just two hours before a March 4, 2021 ICC Board meeting, it stated early on that “rollbacks are prohibited.” Later that day, during an executive session of the ICC Board ([minutes redacted](#), probably for national security purposes), it held a “lengthy discussion about the future of the IECC.” It revised the intent and scope of the 2024 IECC and claimed that the IECC would contain “commitments for increasing the energy efficiency each edition.”

It took seven months, four ICC Board meetings and a residential consensus committee meeting to finally reflect the new scope and intent in the aforementioned IECC fact sheet. In early October 2021, a new fact sheet was created and it no longer contained the words “rollbacks are prohibited.” When asked to explain how and why that phrase was removed, the ICC responded that there was “confusion around whether the term ‘rollback’ applied to code editions or code provisions, (so) the PDF was revised to more closely reflect the language in the new scope and intent.” The ICC added that the scope and intent of the IECC states that the code “is updated on a three-year cycle with each subsequent edition providing increased energy savings over the prior edition...” Put another way, rollback *proposals* are allowed, as long as the overall code/standard doesn’t go backward. When asked if there was a definition for the word “rollback,” the ICC did not comment.

The residential consensus committee first met in September 2021. At that [initial meeting](#), it began to discuss the committee’s Goals statement. That discussion was tabled until the November 2021 meeting. According to all three committee members I interviewed, the chair and co-chairs wanted to establish a goal of a 7 percent efficiency gain. That number was not going to appear in the code, but rather become one for the committee to achieve

“The process has more potential for collaboration, but ICC members no longer have the power they once had.”

via approved proposals. This was met with a lot of resistance from a couple of NAHB representatives on the committee. The committee approved the following Goals statement by a vote of 24-11, the slimmest two-thirds majority possible:

“Facilitate consensus to achieve lifecycle-cost-effective energy efficiency improvements in the next edition of the IECC-R as compared to the 2021 IECC-R. Concise, analytical arguments shall respect various stakeholder priorities and time commitments. The goals of the consensus are to provide increased efficiency and energy performance in comparison to 2021 IECC to maintain the glidepath to net zero energy buildings by 2030. Additional savings and optional measures will be pursued including non-mandatory appendices incorporating additional energy efficiency and greenhouse gas reduction resources.”

ICC was asked to confirm discussion of the 7 percent goal and state why that goal did not make it into the Goals statement, given the lack of detail in the [meeting minutes](#). ICC dodged the question, instead stating that the “final goals statement developed and approved by the full committee is published and available on the Code Council website.”

CAUSE TO WORRY

There was a fear among the committee members I interviewed that the ICC would view the appendices as a path to meet its stated efficiency goals. If true, there would be no incentive to see the efficiency of the code increase, since a net-zero appendix was already adopted in the 2021 IECC. In essence, the net-zero appendix could be used as a crutch. But one committee member noted that it would be wise if HBAs used it (and/or local stretch codes) as market signals on how to get to net-zero construction.

I asked the ICC if a code or standard with only a net-zero pathway in a non-mandatory/optional appendix or stretch code suffices as a net-zero code or standard. The response?

“The Code Council develops model codes that serve as the basis for building regulations adopted by governments. Through the content of the model codes (including appendices), jurisdictions can select provisions that meet their specific policy goals and community needs...The 2021 IECC includes, and future editions will include, provisions for the achievement of zero energy buildings.”

The ICC signaled its intention to establish an Energy Efficiency and Carbon Advisory Council (EECAC) as part of its “Leading the Way to Energy Efficiency” campaign. According to the [ICC’s own website](#), this council will allow “governmental and built environment

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BEFORE	VS	MOVING FORWARD
Future code editions could lessen energy efficiency requirements		Efficiency must increase every edition
No requirement that zero energy building compliance options be retained		Requirement that a zero energy building compliance pathway be included
No requirement to include options to achieve zero energy buildings on timelines sought by governments		Requirement to include option to achieve zero energy buildings by 2030
Scope limits some greenhouse gas reduction strategies		Committees can incorporate greenhouse gas reduction measures, including on-site renewables, energy storage, EV charging and electrification resources
No commitment to efficiency improvements or helping governments address a changing climate		Commitment to helping governments increase efficiency and address a changing climate
No formalized pathway to provide input on Code Council resources for energy efficiency and greenhouse gas reduction		Energy and Carbon Advisory Council established, to inform the direction and scope of Code Council energy efficiency and greenhouse gas reduction resources
All but 2 states that adopt energy codes statewide have adopted an energy code based on the government consensus developed model IECC		All but 2 states that adopt energy codes statewide have adopted a compliance path to meeting adopted energy codes that is developed through a standards process
Governments have the final vote Governments continue to have a leading voice Government regulators fill one-third of committee seats, organizational reserved seats apply		Government regulators fill one-third of committee seats
Proponents provide cost impact statement with varying degrees of cost effectiveness analysis		Transparent cost effectiveness analysis is available to the committee to support decision making
Cost effectiveness analysis, required by many states prior to code adoption, is in practice completed by DOE 1-2 years following publication		DOE's cost effectiveness analysis can be requested and a preliminary analysis could be provided prepublication
Code change proposals handled individually, resulting in less opportunity to capture system or holistic efficiencies		Allows committees to work holistically across the code's provisions to identify strategies to ease compliance and cost savings while maintaining or increasing energy efficiency
Called the IECC		Unchanged – still a code, just like the National Electrical Code
Anyone can submit a proposed change and submit comment on others' proposed changes via an online portal		Unchanged
Anyone will be able to participate in committee hearings		Unchanged
Developed on a three-year cycle consistent with the other I-Codes		Unchanged
Governments have the ultimate say on whether to adopt or amend model codes		Unchanged
Code change proposals limited to single submittal deadline with opportunity to comment to committee actions on only initial code change submittals.		After the committee votes on all initial code change proposals to the 2021 IECC, the 1st draft of the 2024 IECC is published for comment. The entire draft of the 2024 IECC is subject to public comments.

SOURCE: ICC

leaders to advise on which additional greenhouse gas reduction policies the IECC should integrate, the pace that the IECC’s baseline efficiency requirements should advance, and needs and gaps that the Code Council should work to address.” However, this new council was never mentioned in the 20-page response to the U.S. House Committee on Energy and Commerce (HCEC). Furthermore, we are (as of press time) more than 300 days past the ICC Board’s decision to revamp the IECC development process, and the EECAC has yet to be established. This group is supposed to be advising the IECC process, but that process is already well underway. Maybe this new council is meant to advise on the 2027 IECC?

I asked each committee member if they had any other process concerns. One member stated that there were “a lot of cracks in the door to let things through.” The entire public draft No. 1 had been open for public comment, thus rendering the first proposal unimportant. They also felt it would be better if “the ICC didn’t give so much power to the committees, and instead acted like the (Standards Development Organization) SDO.”

POWER GRAB

If the 2021 IECC already meets the ICC’s stated goals that it shares with the HCEC, then any additional efficiency gains will have to come at the state and local level. That will prove to be a challenge.

For example, the state of Illinois has a history of being near the front of the pack when it comes to keeping its energy code up to date. It is now near the end of its state adoption process, and through two (of three) rounds of votes (as of press time), lawmakers have decided to keep some 2018 prescriptive values (Table R402) and rejected electric vehicle (EV)-ready and electrification proposals because...they weren’t found in the 2021 model code. (They had been in there, but thanks to the ICC Board overruling the overwhelming majority of its own voting members, those provisions were removed.)

Technical and energy efficiency advancements can be relegated to the appendix, but appendices aren’t even required reading, let alone required to adopt. Can you really take credit for something that can so easily be ignored?

The ICC said it outright: “The Code Council develops model codes that serve as the basis for building regulations adopted by governments.” That’s correct; the model code can be tailored to suit local circumstances and situations. Yet, the ICC has often preferred to stay out of the state and local code adoption processes. If ICC has a model code that, by and large, remains in stasis, and won’t defend it against weakening amendments at the lower levels, then how can ICC hope to accomplish the goals it led us to believe that it wanted?

I’m hearing the line from that song again. **GB**

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

COURTESY OF The Green Builder® Coalition

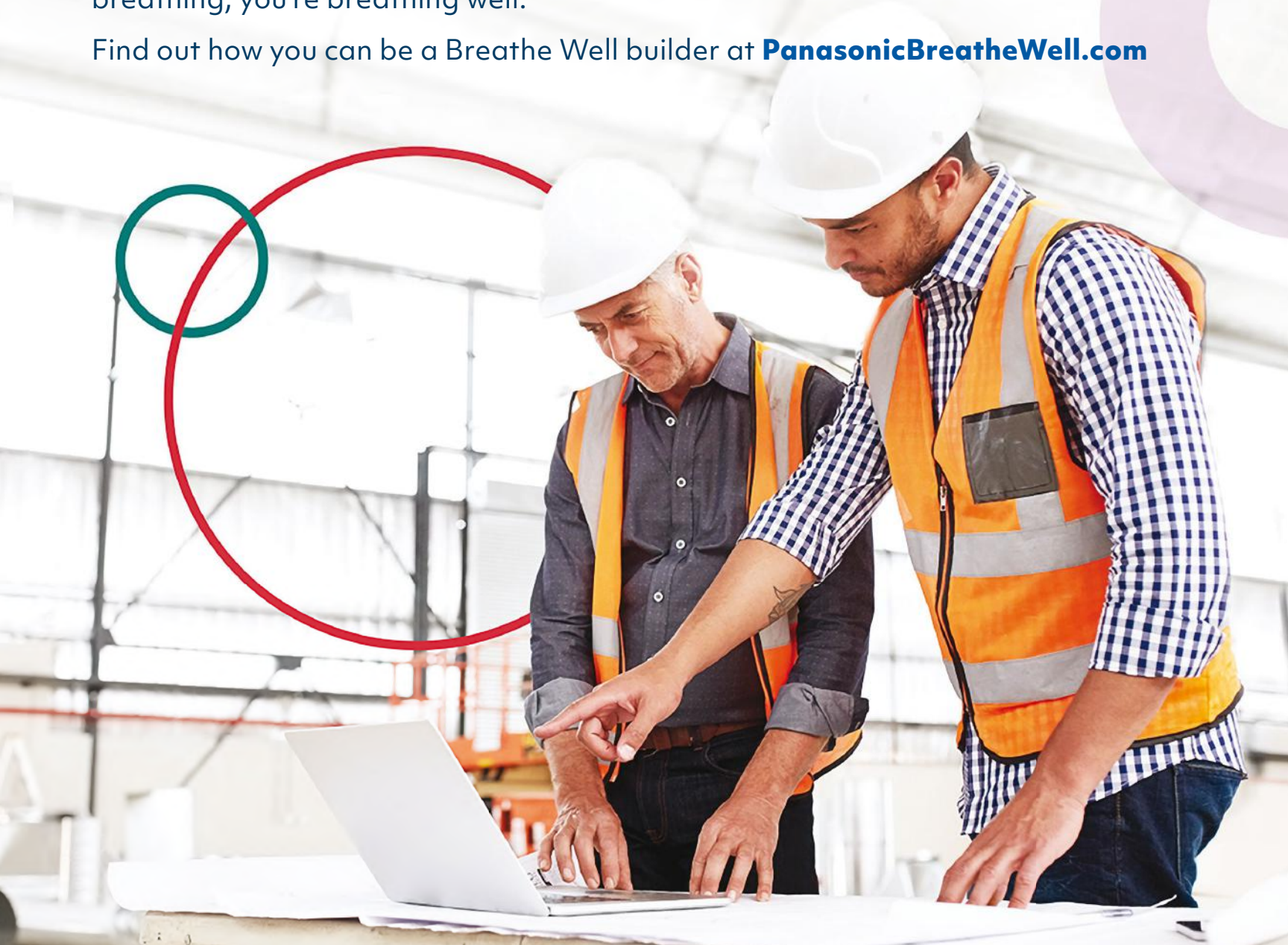
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HOUSING 2.0

MYTH BUSTER: Do Homes Really Increase in Value?

When it comes to making the best housing investment, bigger is not better.

BY SAM RASHKIN

This is Sam Rashkin's fourth in a series of articles based on his second book, "Housing 2.0: A Disruption Survival Guide." It is intended as a roadmap for high-performance builders to become the most successful in the industry.

WHY IS THIS ARTICLE ABOUT HOUSING appreciation for a *Green Builder* audience devoted to sustainable building? The simple answer is that a successful zero carbon movement is too important to get the value part wrong. And although high performance is critical in new homes, it's a small slice of the total user experience pie. Housing is the ultimate consumer product, where

we spend 70 percent of our lives, so a small slice is not nearly enough. Environmentally conscious housing professionals must be focused on the total user experience, driving value to ensure a successful zero carbon transformation.

The best place to begin is to debunk the myth, "homes increase in value." That's misleading. Like any other large purchase (e.g., cars, boats, RVs, furniture, etc.), the house itself depreciates as it becomes worn, out-of-date, and in need of repairs.

So why do home prices increase? It's because of the land part of the real estate transaction. Typically, land appreciates much more than the house depreciates. That's because land becomes significantly more valuable as it becomes scarcer and landscaping matures. As a result, homeowners typically realize a net increase in the future total value of their property (see Figure 1).

Note there has been an enormous double-digit spike in the housing appreciation rate since the pandemic, but that rate is not sustainable. This is because the gap between median home price to median household income has been increasing exponentially for decades, and has reached a crisis point (see Figure 2). This

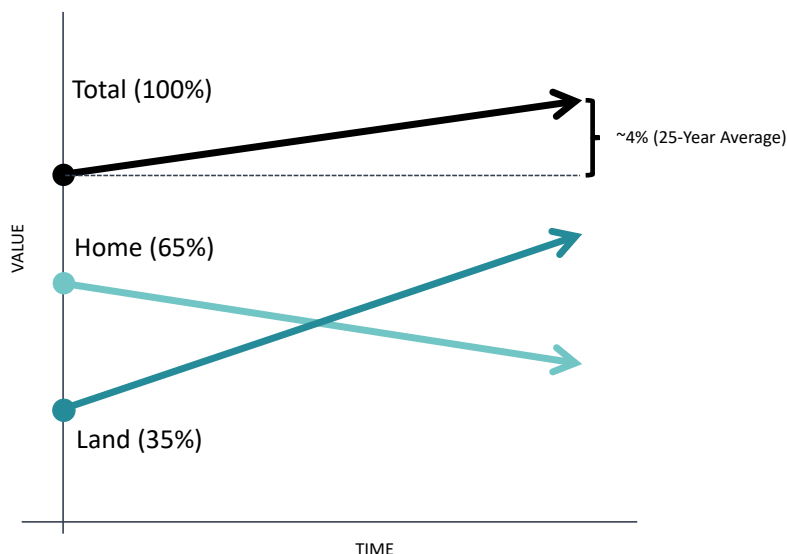


Figure 1: Land appreciation greater than home depreciation results in net positive appreciation.

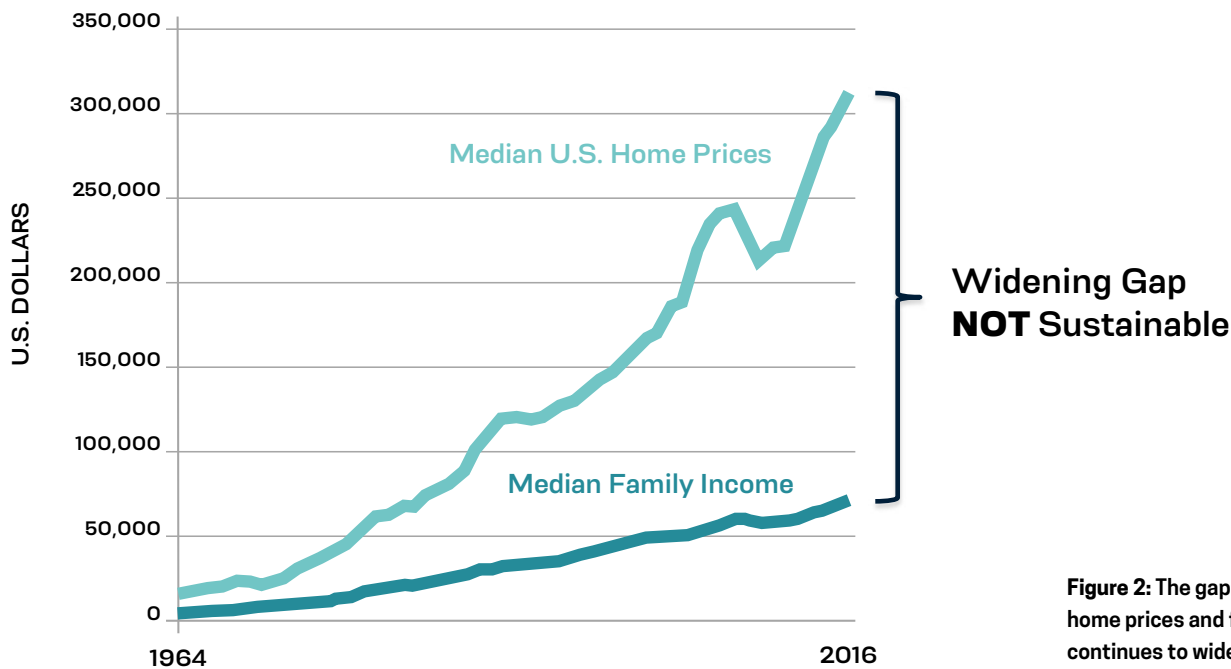


Figure 2: The gap between median home prices and family income continues to widen. SOURCE: THE FEDERAL RESERVE

suggests that a huge land price bubble may be unavoidable.

Net home appreciation rates are often substantially overstated, because they leave out significant expenses incurred from maintaining and updating homes. Although these improvements usually add to home value, research shows they recoup significantly less than their cost.

The concept of land appreciating while the home depreciates explains why real estate experts recommend buying the least-expensive home in the best neighborhood to optimize return on investment. Let’s see how this works.

We’ll start by assuming a price split that is common for newly constructed homes—65 percent for the home and 35 percent for

the land. In addition, we’ll assume land appreciates at 6 percent per year, while the home depreciates 2 percent, for a 4 percent net appreciation rate, aligned with the 25-year national average pre-COVID. Using a \$400,000 median price home for the U.S. in 2021 means \$140,000 is attributed to the land, while the remaining \$260,000 is attributed to the home.

A homebuyer would get a substantially greater return on the same \$400,000 investment buying a much more modest house in a higher value neighborhood (e.g., flipping the value of land to 65 percent and home to 35 percent). This increases the value of the appreciating asset, land, from \$140,000 to \$260,000, and results in \$117,000 greater return over the average 10-year term

Community Comparison: \$400,000 Purchase Price

Appreciation Rate		% Split of Value		10-Year Value	10-Year Value Difference
Land	Home	Land	Home		
Example 1: Community with Higher vs. Lower Land Value					
6%	-2%	35%	65%	\$463,000	\$117,000
6%	-2%	65%	35%	\$580,000	
Example 2: Community with Low vs. High Land Appreciation					
4%	-2%	35%	65%	\$420,000	\$95,000
8%	-2%	35%	65%	\$515,000	

Figure 3: Examples of higher return on investment by optimizing land value. SOURCE: AUTHOR’S PROPERTY VALUE CALCULATOR TOOL

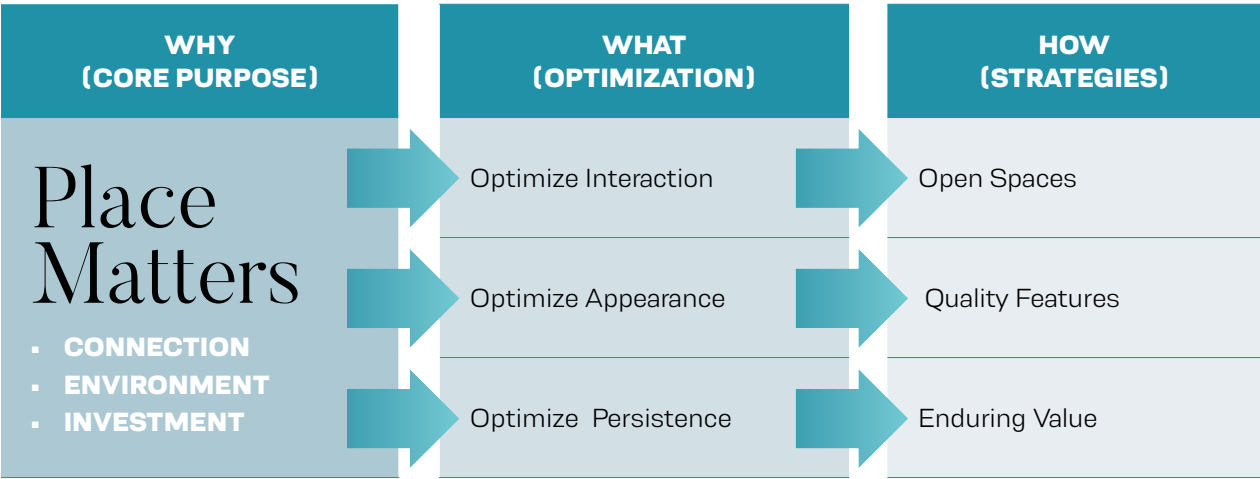


Figure 4: The Housing 2.0 Framework is used to optimize community value.

of home ownership (see example 1 in Figure 3.) Alternately, a savvy homebuyer may carefully select a home in a development optimized for the community experience, and realize an increased land appreciation rate of 8 percent, compared to a poorly planned community where the land only appreciates at 4 percent. If the land accounts for 35 percent of the new home value, the \$400,000 investment in a better community results in \$95,000 greater return (see example 2 in Figure 3).

This myth-busting clarification is the reason behind the often-repeated mantra in real estate, “location, location, location.” But how does this value concept relate to sustainable housing? The march to zero carbon homes is critical for our planet, and represents a certain future of the housing industry. Here’s why that train has left the station.

First, our latest national energy code, IECC 2021, is equivalent to a zero energy-ready enclosure that exceeds the requirements of U.S. Department of Energy Zero Energy Ready Home program. The environmental community needs to encourage all states to adopt this latest code. As a great start, seven states and U.S. territories are already at various stages of developing and implementing zero energy codes, including California, Oregon, New Jersey, New York, Puerto Rico, and Washington. In addition, a growing number of states have policies for establishing carbon-free electricity by 2045-2050, including California, Colorado, Maine, Nevada, New Mexico, New York, Puerto Rico, and Washington. National policies may follow suit. It’s time for all housing professionals to get on the path to zero carbon.

Integrating great community experiences with sustainable developments that will stand the test of time is vital to the success of this movement. Sustainable housing professionals need to expand their primary focus

beyond the home to best practices for the communities desired most by American homebuyers.

This especially includes affordable housing developments. This segment of the housing sector can least afford an absence of attention to the appreciating asset, the land, because they are most in need of the increased value. A framework for ensuring optimized communities is included in my new book, “Housing 2.0: A Disruption Survival Guide.” The key “Why,” “What,” and “How” elements for the Housing 2.0 framework are shown in Figure 4.

When a home buyer makes a poor choice that results in a bad community experience, there are only two options to correct it. One is to absorb the huge expense and burden of moving, and the second is to accept and/or rationalize the choice rather than moving. I have observed the latter far too often. Thus, the “why” for the community experience is simple: Place matters. It really matters. It’s about an opportunity for connection. It’s vital to be able to engage with neighbors at each individual’s preferred level of interaction. It’s about the environment around us each day. We all want to live in places that are nurturing and aesthetically pleasing. And, it’s about confidence in a sound investment. A home is often the largest purchase of a lifetime, and it should be located in a neighborhood that proves to be a good investment.

Optimize Community User X	BEST PRACTICES	% SPLIT OF VALUE
	Apply Community User X Framework	\$20K – \$100K* Added Value per Home*
	Solar Orientation	\$10 – \$20K 30-Year Utility Savings
	Special Views	\$10 – \$100s K** Added Value per Home
	Optimize Trees	\$20 – \$100+K*** Added Value per Home

Figure 5: Accrued cost savings and added value optimize the community user experience.

The “what” and “how” for delivering a great community experience are substantially linked. First, it’s essential to optimize desired opportunities for interaction. That is achieved with effective open spaces.

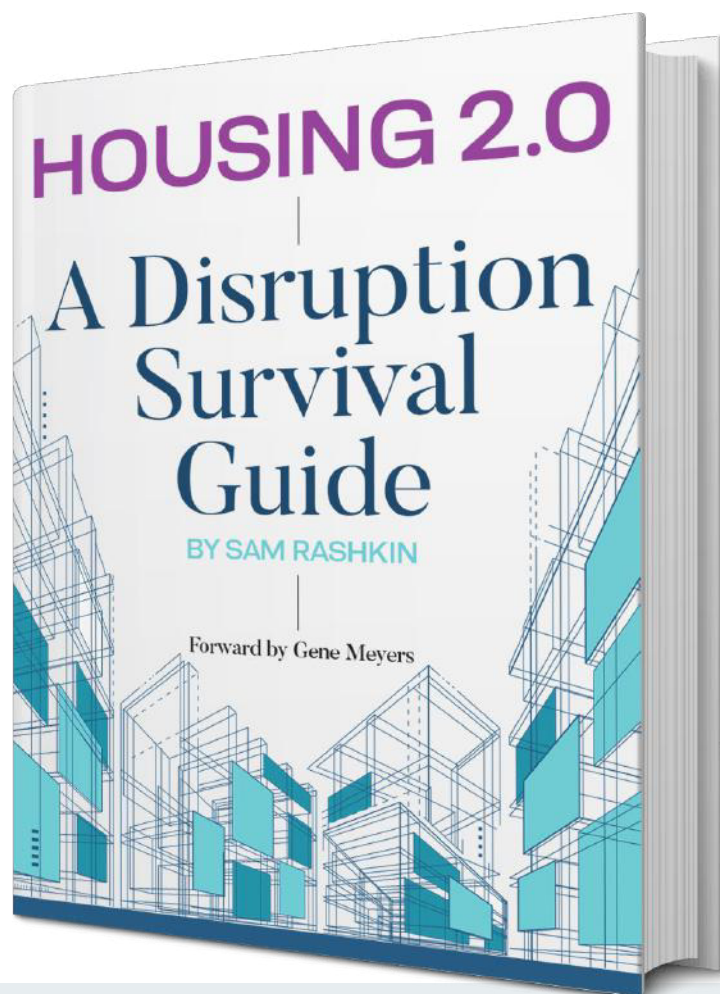
Second, great communities optimize appearance, which is achieved through investment in high-impact quality features consistent with a targeted budget.

Third, it’s important to optimize persistence of a vibrant community, which is achieved with development tools that help ensure enduring value for all homeowners. More than 20 best practices for executing this framework are provided in the book. The accrued cost savings and added value tabulated in Housing 2.0 are shown in Figure 5 and add up to hundreds of thousands of dollars per home. Sustainable home design can no longer be divorced from community design and planning.

One last note: I’m excited to announce that “Housing 2.0: A Disruption Survival Guide,” has just been published and is available at greenbuildermedia.com/housing-2.0-a-disruption-survival-guide **GB**

Sam Rashkin’s two-decade career as a licensed architect includes serving on national steering committees for the U.S. Green Building Council (USGBC)’s LEED for Homes, Green Builder Media’s Green Builder Guidelines, the Environmental Protection Agency (EPA)’s WaterSense label, and EPA’s Indoor airPLUS label. He has partnered with Green Builder Media to develop the **Housing 2.0 program**, which empowers building professionals to design and construct higher-performance, healthier and more-sustainable homes at a fraction of the cost.

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How Good is Your Neighbor?



Ron Jones
Co-Founder and President
Green Builder® Media

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ON DECEMBER 30, 2021, a sudden and devastating wildfire, driven by freakish winds sometimes exceeding 100 miles per hour, swept through two communities in Boulder County, Colorado. In a few hours, almost 1,100 homes were completely consumed. At least one

elderly homeowner lost her life in the fire and, as of this writing, another is still missing.

As cruel as the disaster proved to be, the families had no way of knowing that their direct losses due to the fire would be only the first of their miseries. The fire also left hundreds of families without shelter when a wicked snowstorm swept through the same area a day later, bringing freezing temperatures and dumping inches of snow.

The families' communities are in a housing market that is already stretched to the breaking point, with demand outpacing supply in existing and new construction. Because of that, and the all-too-familiar stresses on the building industry affecting every region of the country, many owners find themselves months, if not years, away from opportunities to rebuild.

To magnify the problem, the communities had recently adopted updated building and energy codes that were set to go into effect earlier this year. Certain builders, and the home builders association trade group with jurisdiction in the fire area, shamefully used the tragedy to leverage their anti-regulation agenda. They quoted outrageously inflated cost increases related to the new codes. In many instances, they threw out numbers intended to shock and horrify the fire victims, or perhaps to establish a false pricing

notion that could set the stage for price gouging of future customers desperate to rebuild their homes and their beloved neighborhoods.

Many of those homes were built years, even decades, prior to the fire. The owners had no reasonable way of knowing how much the costs to rebuild have escalated during that time. Even homes that were built in the last year or so would be impossible to rebuild for the same dollar figures today due to recent dramatic increases in the costs of materials and labor.

As if this reality were not enough, the vast majority of those attempting to file insurance claims quickly found out that they were underinsured by hundreds of thousands of dollars or more. Many were stunned to learn that even though their trusted insurance agents had repeatedly assured them they were adequately covered, nothing could be further from the truth.

Insurance is a highly competitive industry. Just count the number of insurance ads on television the next time you tune in. There are many agencies vying for the same piece of business in markets across the country. Sadly, most consumers are so price sensitive that they will accept the information they're given, even if they aren't completely convinced that it's accurate. It just has to sound good.

The state of Colorado is looking into the situation. It remains to be seen whether any accountability will fall on the companies providing the policies or the agencies representing them.

Meanwhile, I received a phone call last week from the agency that holds the policy for our home. It wanted to schedule a call to review my coverage. We agreed to speak this morning, but it is now afternoon and I have heard from no one. How does the song go, "since my phone still ain't ringin', I assume it still ain't you." Somehow, those "good hands" and my "good neighbor" don't have me feeling so good. **GB**



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