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GREEN BUILDER[®]

May/June 2025 / www.greenbuildermedia.com

Affordable Resilience

Material prices keep rising as buyers hit the brakes. But we've got ideas on how to keep hard costs down while making homes storm ready and energy efficient.



ALSO IN THIS ISSUE:
Double Reveal: We're "unveiling"
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nation's hottest markets:
Las Vegas and Austin.

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*December 2024 Analysis – Results are based on random sample of 6,000+ U.S. Honeywell Home ENERGY STAR thermostat users, in 2023, who adopted a schedule routine, incorporating the default schedule setpoints at least 14 days in a monthly period. It compares users' scheduled setpoints, following the default schedule setpoints, to their own comfort baseline setpoint during both heating and cooling modes.
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Fortress. This ICF home in Mexico Beach, Florida, famously survived a Category 5 hurricane in 2018, while 1,700 homes around it blew away. CREDIT: NUDURA



TORNADOES, TARIFFS AND ICFS

At the intersection of the climate crisis and lumber inflation, ICF homes have never looked better.

The storms came early this year, wiping out homes across the South and Midwest. Arkansas took a beating, as did Kentucky, Mississippi and even Oklahoma. Imagine the constant anxiety that homeowners must be feeling.

At the same time, lumber prices are spiking due to tariff chaos. FEMA seems to be in limbo, crippled by cuts and confusion. States find themselves on their own in the rubble, despite [pleas for help to Washington](#). But there's no cavalry on the horizon. We're on our own.

Builders can do something to help: Switch to insulating concrete forms (ICF) construction.

Try crunching the numbers. ICFs are about to reach price parity with lumber-framed homes again, just like [during the pandemic](#). Combine this bottom line with their strength, labor savings and performance—plus the growing availability of less energy intensive concrete—improved with products such as recycled glass aggregate from Opta Glass.

Wood-framed houses have structural limitations. Even the strict Florida Building Code (FBC) sets design wind speeds up to 180 mph in certain high-risk areas. But that's still below the strength needed to handle large tornadoes, which can hit 200 mph or higher.

ICF homes, when detailed properly, offer excellent tornado resistance. For example, during 2021, a [Nudura ICF home](#) in Bowling Green, Kentucky, remained standing as homes around it blew away in a season of tornadoes.

Florida Green Building Construction, based in Palm Coast, Florida, specializes in ICF homes, emphasizing resistance to 200 mph winds.

Notably, their designs go beyond the basic ICF shell. Windows and doors must be protected. Wood-framed roofs must be strengthened. Impact glass is recommended, but I'd opt for an upgrade to rolling shutters or the [equivalent](#), extra roof ties, bracing, and spray foam added to roof assemblies. Spray foam can increase roof uplift resistance by up to 250 percent.

While it may be impossible to completely fortress an ICF home against the very worst EF5 tornado, [99 percent](#) of tornadoes to hit the U.S. since 1950 have not exceeded 200 mph.

The economics and the times point to a need and an opportunity for homebuilders in much of the so-called "heartland" of the nation. We're 3 million units of housing short of what's needed in this country, with a surplus of luxury product and a shortage of resilient homes.

FEMA recommends that most people duck and cover into a [safe room](#) during a tornado. But instead of throwing up their hands, can't we give them homes that survive?

ICF technology should have a dominant place at the table, not only for builders, but also for governors and public officials facing down the new reality of worsening climate disasters without a federal safety net. **GB**



Matt Power
Editor-in-Chief

matt.power@greenbuildermedia.com

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†Based on laboratory testing simulating full summer sun exposure at noon over an extended period, comparing the colors Salt Flat to Woodland Brown. Actual temperature reduction may vary depending on environmental conditions, color and usage.

Air Quality Gets Another Failing Grade

Almost half of the nation's residents live in dangerously polluted areas.

Forty-five percent of all United States residents breathe unhealthy levels of air pollution, according to the American Lung Association (ALA)'s annual "State of the Air" report. Nearly 156 million people—25 million more than last year's report—live in an area that the association gives a failing grade for ozone and measures of fine particulate matter pollution. The top three most-polluted cities in this regard are in California: Bakersfield, Visalia and Fresno. Eugene, Oregon is fourth, followed by Los Angeles in fifth.

The study also says that 85 million people in the U.S. live in an area with a failing grade for year-round short-term particle pollution, the second-highest number of people with such exposure since the report was first published in 2000.

Much of the pollution stemmed from a record number of warm days and wildfires, which caused "horrible ozone years," according to Katherine Pruitt, ALA's national senior director for policy. Things may not get much better: As part of the "biggest deregulatory action in U.S. history," the Trump



Out of breath. Increased ozone levels from wildfires and automobile emissions have made Los Angeles into one of the nation's most-polluted cities—again.

CREDIT: ISTOCK/EVEEM MOBILE GMBH

administration is considering loosening regulations on power plants, the oil and gas industry, coal plants and other industries, and machines that generate air pollution. **GB**

Tech Giants Plan Nuclear's Comeback

Meta, Amazon and Google hope to triple 'clean' nuclear energy production by 2050. Should we be cheering or jeering?

Currently, only 9 percent of the world's power is generated by 439 nuclear power reactors. Several of the world's largest tech firms—Meta, Amazon and Google—plan to join forces and produce nearly 1 million megawatts of nuclear energy by 2050, effectively tripling the global output in half the time it took to reach its current level, according to a report by The Pulse. The goal, the report notes, is to promote nuclear energy as a clean source of power.

The tech giants are joining more than 30 countries that made a similar pledge at COP28, the United Nations Climate Change Conference in 2023.

Proponents argue that nuclear technology is safer now, producing less waste than older plants. But sustainability experts see nuclear plants as dangerous and foolhardy liabilities, when renewable options are available.

Disposal of spent radioactive fuel remains a multi-generational challenge. Nuclear reactors require lifelong maintenance and monitoring and they



Why nukes?? As emphasis on clean energy shifts, the billionaire class sees nuclear power as a good investment, in part because their AI computing consumes such vast amounts of energy. CREDIT: ISTOCK/ARTUSH

become extremely dangerous assets during periods of conflict. See the Ukraine-Russia war for examples. **GB**

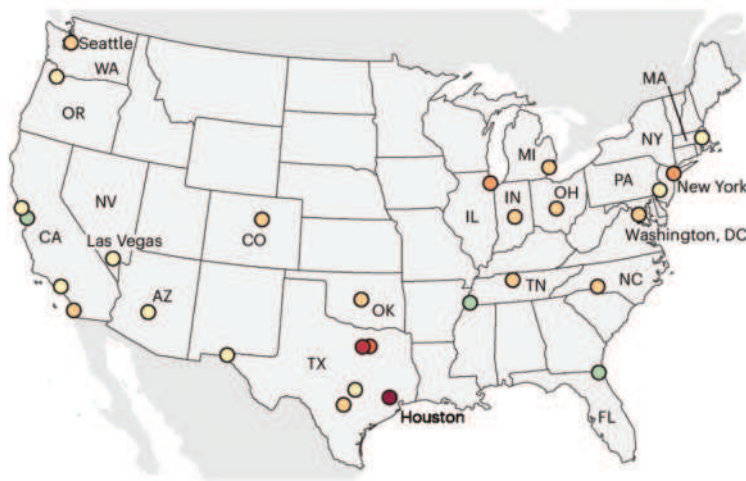
Groundwater Woes

As water demand increases, some of the nation's largest metro areas are literally sinking.

Excessive groundwater extraction is causing 25 of the nation's largest population centers to slowly sink, according to a new study by U.S. researchers. The report, "[Land subsidence risk to infrastructure in U.S. metropolises](#)," states that many of the cities are experiencing subsidence of 1 millimeter to 5 mm annually. This may not sound like much, but over time it's enough to "significantly compromise the structural integrity of buildings, roads, bridges and dams."

The cities with the most widespread sinking—impacting about 98 percent of their individual areas—are Chicago, Dallas, Columbus, Detroit, Fort Worth, Denver, New York, Indianapolis, Houston and Charlotte. Overall, an estimated 34 million people in the 25 cities are affected. Geologic and orbital satellite data from 2015 to 2021 was used for the study. "Water pumped from wells isn't something that people think about often," notes Columbia University researcher and study lead author Leonard Ohenhen. "You just turn on your tap, do what you need to do, and you go on your way."

Population growth is the major cause, but climate change is also a culprit, the



Deep trouble. The rate of sinkage varies greatly among cities in the report. The darker the circle, the greater the change: A dark red circle reflect 5 millimeters or more of sinkage annually, while yellow indicates less than 1 mm. The green areas are places where the ground level has actually increased by less than 1 mm.

CREDIT: LAND SUBSIDENCE RISK TO INFRASTRUCTURE IN U.S. METROPOLISES

report notes. Hotter temperatures and more-extreme droughts dry out soil, streams and reservoirs, leading people to pump larger quantities of freshwater from underground. The study is available in the journal *Nature Cities*. **GB**

EDITOR'S NOTE: Arclin, a finalist in our annual Sustainable Products of the Year edition, was inadvertently left out of the March/April issue. Here is the company's winning product.

Arclin Firepoint fire-resistant building material

With wildfires now an increasingly dangerous threat to properties nationwide, Arclin's *Firepoint* fortifies homes with a "coat of armor" that resists and slows the spread of flames, minimizing damage. The patented, fire-resistant building material can withstand a blaze for up to 90 minutes on wall assemblies, significantly outperforming traditional materials. The product offers 53 percent more fire resistance than standard code requirements.

Slowing the rate of fire damage helps residents and first responders gain critical extra time to react, ultimately helping to save lives and protect a family's home and valued possessions.

Lightweight and easy to handle, *Firepoint* eliminates layers in interior and exterior wall assemblies, offers efficiency in materials and labor, and provides the flexibility to use any cladding—all while reducing construction time. The product is available for single- and multi-family homes. **GB**

FOR MORE INFORMATION: WWW.FIREPOINT.ARCLIN.COM/



[STRUCTURAL SURFACES]

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COVER:

BlueGreen Building Concepts

(<https://bluegreenbuildingconcepts.com>)



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“The winning strategy says if you can't bring the people to the water, bring the water to the people.” [PAGE 64](#)

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RESILIENCE RISING

Sized right. Thanks to escalating prices, an increasingly sour public opinion on the economy, and a shift in priorities among generations, small, less-luxurious homes are back in fashion. CREDIT: PATRICK DAXENBICHLER



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COST-EFFECTIVE CONSTRUCTION

As global markets and costs shift, **builders can protect their profits** and their 'above-and-beyond' reputations by zeroing in on key systems and products.

BY MATT POWER

Experts in the U.S. auto industry offer some good insights into how to handle economic roller coasters. A few weeks ago, as the Trump Tariffs first hit, Car and Driver reported that automakers were pivoting quickly, pulling back on frills and extras, emphasizing base model products.

For example, Will Hardeman, managing partner of Continental Automotive Group, noted that “in some cases, the industry got into a feeding frenzy by putting too many options and equipment on their cars,” he says. “They achieved good margins, but they might need to offer more basic versions of cars. The industry has gotten into upfitting cars with lots of fancy options.”

That same strategy could be applied to the homebuilding sector.

Homebuyers from my generation, the “Boomers,” have become a bit spoiled in our expectations about new homes. Our COGNITION surveys over the past couple of years suggest that we’ve passed some of those preferences on to our millennial offspring. Perhaps the whole industry bears a bit of the blame. To excite clients and entice them to spend more, we’ve blurred the distinction between luxuries and necessities. For example, when did the three-car garage become an essential upgrade? Why are granite countertops still a top choice, when so many cool (and more sustainable) materials exist? Does every home need an outdoor kitchen and a window wall instead of French doors to the patio?

This economic turbulence might be a chance to downsize some of housing’s most extravagant “nice to have” features. I believe we can still deliver outstanding homes that move quickly from completion to closing, simultaneously doing less environmental harm and staying financially solvent.

FROM FEAR TO RESILIENCE

Some of you are thinking, “those luxuries are client preferences—out of my control.” But we’re living through an economic sea of change. At this writing, “extreme fear” is the metric that’s [driving the U.S. stock market](#), and consumer confidence just hit a 12-year low.

Maybe we can squeeze some lemonade from those lemons. That fear, at this date, hasn’t deeply impacted the housing market, at least not in the U.S. as a whole. Most of the leading forecasters suggest a slow but

steady pattern of sales over the next few years. Already, the industry is easing toward houses [that are smaller and more affordable](#). Some of these forecasts probably understate the shift. They were made before the recent tariffs, and the downsizing trend was already underway. What impact will the Trump tariffs have? That’s still playing out. But it’s a safe bet that buyers will remain cautious for some time—willing to buy, but wanting to spend less for their dream home.

The upper end of the housing market may stubbornly absorb higher costs on everything, but everybody else will be looking at budgets.

Where can cost cutting happen? A lot of things are non-negotiable, even in the more modestly priced end of the production housing sector—say, between \$300,000 and \$500,000. There’s no way homebuyers are going back to galley kitchens, low ceilings and wall-to-wall carpet.

For example, if they’re willing to forego the 25-foot foyer entry, can you offer them lower monthly energy bills and a smaller HVAC system up front?

“Why not change the conversation and offer clients a home that costs less to operate and stands up to climate extremes, in exchange for features in the home that they may feel they are giving up?”

I’d like to offer you a “sell sheet,” if you will, to help you talk with clients about their new homes in a way that’s realistic about the market’s current concerns. What you’re offering them, to borrow a cliché, is “peace of mind.”

What you, the builder, architect or developer, can provide that your less-progressive competitors may not, are homes that require lower energy inputs, less maintenance and less upfront investment. At the same time, they keep occupants safe, comfortable and feeling good about their purchase.

In this special report, I’ll look deeper into five ways you might hone your product to get a “win” for your business and your clients, even in this stressful environment: smaller floorplans, optimized roof assemblies, “focused” landscaping, *a la carte* smart features and structural alternatives.

House Size: Smaller Plan Perks

Going, going, gone. Indigo, an infusion of smaller homes in a 235-acre planned development near Houston, is selling quickly and smoothing the way for hundreds more projects this year. IMAGES COURTESY OF HIGHLAND HOMES

If there's a proverbial elephant in the room at every model home center, it's the matter of square footage. Many buyers walk in the door with a baseline template they want: three bedrooms, three baths, three-car garage—are we sensing a trend here?

Smaller floorplans cost less to build, they use a lot fewer resources and they run on a lot less energy over the span of decades.

CONSTRUCTION COST DIFFERENCE			
COST PER SQUARE FOOT	1,800 SQUARE FEET	2,200 SQUARE FEET	DIFFERENCE
\$120	\$216,000	\$264,000	\$48,000
\$150	\$270,000	\$330,000	\$60,000
\$200	\$360,000	\$440,000	\$80,000

Finish matters. The higher the average square footage cost to build a home, the greater the potential upfront savings with a smaller plan.

Smaller homes use less energy for heating, cooling, lighting, and hot water. Based on U.S. Department of Energy (DOE) data and real-world utility analysis:

- On average, a new 2,200-square-foot energy-efficient home may use **~11,000–13,000 kWh/year**
- An 1,800-square-foot equivalent may use **~9,000–10,500 kWh/year**

Assuming \$0.14 per kilowatt hour (kWh) (based on national average):

- Energy savings = **1,500 to 2,500 kWh/year**
- Annual savings = **\$210 to \$350/year**

And in hot climates where A/C is the dominant load? That gap can widen, especially with radiant barriers and efficient design.

Smaller homes also offer lower long-term maintenance, including:

- Less roofing to replace over time
- Fewer opportunities for plumbing failures over time
- Less repainting and maintenance of exterior siding
- Lower cleaning and upkeep burden

Put into real numbers, you could tell would-be buyers to expect to save **\$200 to \$400/year** in reduced maintenance and repair costs, depending on usage and materials—and that's a modest estimate.



TOTAL 10-YEAR SAVINGS FOR:	1,800-SQUARE-FOOT HOME	2,000-SQUARE-FOOT HOME
CATEGORY	ESTIMATED 10-YEAR SAVINGS	
Construction Cost	\$48,000	\$80,000
Energy Cost	\$2,100	\$3,500
Maintenance Cost	\$2,000	\$4,000
Total (10-Year Savings)	\$52,100	\$87,500

WHO WILL BUY?

There's a misconception that smaller houses won't sell. The reality is that home sizes have already downshifted since 2020, averaging about 200 square feet less than they did prior to the pandemic.

Recent trends indicate a shift toward smaller homes. In the past 5 years, the average home size listed for sale has decreased by 7 percent, from 1,926 square feet in March 2020, to roughly 1,800 square feet in March 2025. This trend is attributed to rising inflation, high interest rates and soaring construction costs, making larger homes less affordable for many buyers.

Take the case of [Indigo](#), a new development in Richmond, Texas: According to [Chron.com](#), the first phase of Indigo includes 16 cottages, ranging from 950 to 1,400 square feet, built by [Empire Homes](#). Those sold in 45 days, partly due to the competitive price point, with one of the cottages initially selling for \$219,000—a price practically unheard of in the Houston area under the current market. The development also features “duets,” or duplexes, which have already sold out. This makes them the second-most popular option.



Interestingly, Scott Snodgrass, founding partner of Meristem Communities—another Indigo builder—has seen that about a quarter of these buyers are intergenerational families or close friends.

One pushback against smaller floorplans is that they're just offering less for the same price. [Realtor.com](#) notes that one way homes are reducing in size is by “giving up” hallways. That may be true, but when smaller homes are sold as part of a theme, with emphasis on their efficiency, attention to *context* (such as the Indigo example) seems to compensate for any perceived reduction in amenities.

Also, less-palatial homes offer even greater long-term cost savings for owners than lower maintenance. Reducing square footage is one of the few ways to mitigate property taxes, for example.

In addition, many insurance companies offer premium reductions for certain features, including:

- Leak detection systems
- Rafter hurricane clips
- Impact-resistant roofing
- Security systems
- Fire and smoke alarms and sprinkler systems

Just these two expenses alone are major resilience factors that are especially appealing to those on fixed incomes. **GB**

Size and the ‘Jones’ Factor

According to research by [Clément Bellet](#), one key to getting buyers to embrace smaller homes is not trying to wedge them in around larger product. He found that when bigger houses get built closer to smaller houses, house satisfaction is lower among the smaller households.

This line of research suggests that the perceptions of optimal home size are at least partly rooted in comparison with the Joneses—not necessarily a “real” consideration of comfort or discomfort. Couldn’t we take this line of reasoning to its logical conclusion? If you build small, and surround small homes with other small homes, residents will be happier with smaller spaces.



Bad blood. When home sizes don’t match up, neighbors start to feel tension.

Rigid defense. An inch of polyisocyanurate foam dramatically reduced heat gain on the VISION House Scottsdale.

Optimized Roof-Attic Assemblies

Basketball great Michael Jordan famously told Parade magazine, “The minute you get away from fundamentals, the bottom can fall out of your game.” The combined features of a roof and attic are arguably the most fundamental feature affecting home energy performance. And research shows that you can strategically (and affordably) boost the performance of your roof and attic assemblies.

Over the past few years, we’ve looked at many types of roofing, underlayments and roof assemblies. For example, we found that adding a single inch of rigid foam on Steve Easley’s [roof deck in Scottsdale, Arizona](#), was found to lower the OSB temperature by 30-40 degrees, making even the most extreme heat manageable.

But roof systems consist of many layers. Let’s start at the top and work downward, suggesting some affordable improvements.

PHASE 1: COOL ROOFING PLUS A RADIANT BARRIER

Another affordable way to crush roof efficiency is by combining so-called “cool roofing” with low-cost radiant barriers. While we’d like to see metal or tile roofs on more homes, the reality is that cautious buyers may not pay for that upgrade. So, make the most of asphalt by specifying reflective products.

Cool roofing costs a little more than standard shingles. How do you upsell it to clients? Explain that not only will it last longer than conventional alternatives, in extreme heat conditions, it also protects other parts of the roof assembly from accelerated aging, and may allow the buyer to specify a smaller, more-efficient HVAC system. And that’s before we even talk about attic insulation.



HOT CITIES IN 2023—NEW EXTREMES

CITY, STATE	HIGHEST TEMP (°F)	DATE (2023)	APPROXIMATE HIGHEST SUSTAINED TEMP (°F)	SOURCE/REFERENCE
Death Valley, CA	128°F	July 16	~ 126°F (multi-day)	NWS Las Vegas
Lake Havasu City, AZ	125°F	July 16	~ 120°F (2-day high)	NOAA Daily Summaries
Needles, CA	123°F	July 17	~ 119°F (2-day high)	NWS San Diego
Laughlin, NV	122°F	July 16	~ 117°F (multi-day wave)	NWS Las Vegas
Baker, CA	121°F	July 16	~ 118°F (2-day high)	NWS Las Vegas
Palm Springs, CA	120°F	July 15	~ 117°F (repeated peaks)	NWS San Diego
Yuma, AZ	120°F	July 12	~ 118°F (2-day high)	NWS Phoenix
Phoenix, AZ	119°F	July 25	~ 116°F (multi-day wave)	NWS Phoenix Records
Las Vegas, NV	116°F	July 16	~ 114°F (2-day high)	NWS Las Vegas
Tucson, AZ	114°F	July 25	~ 112°F (3-day wave)	NWS Tucson
Laredo, TX	115°F	July 20	~ 112°F (multi-day)	NWS Corpus Christi
Jackson, MS	104°F	August 26	~ 101°F (3-day high)	NWS Jackson, MS
Atlanta, GA	103°F	August 13	~ 99°F (2-day peak)	NWS Atlanta (Peachtree)
Tallahassee, FL	105°F	August 12	~ 98°F (multi-day wave)	NWS Tallahassee

Cool shingles. CertainTeed's landmark *Solaris* shingles reduce roof heating by up to 20 percent in summer months.

THE SCIENCE OF ROOFING HEAT STRESS

Standard asphalt-based shingles (including fiberglass/asphalt composition) usually have service temperature tolerances up to around 180-200 degrees Fahrenheit (82-93 degrees Celsius). At those levels, they may begin to soften, lose granules and age rapidly. In part, this is because sustained high surface temps increase oil exudation (where asphaltic oils seep to the surface), leading to premature brittleness and cracking.

Past studies have measured peak roof temperatures for asphalt shingles in hot climates at about 170°F (76°C)—just brushing the edge of the “breakdown” zone. The rest of the roof, including OSB decking and traditional felt paper underlayment, has about the same tolerance for sustained heat before they, too, start to show negative effects.

These roof temperature estimates, however, are based on yesterday's weather data: when hot days rarely exceeded the 90-to-100-degree range. The world is getting hotter, and that's a problem for new and existing roofs.

Oak Ridge National Laboratory (ORNL) estimates that dark asphalt shingle roofs can run 50-70°F (28-39°C) hotter than the ambient air temperature under typical summer conditions. So if the ambient temperature is 90°F (32°C), shingles on a roof might reach 140-160°F (60-71°C). If temps hover around 120°F for several days, as they did in some places last year, shingles may hit 190°F or more, suffering permanent damage.

Hot spots. The worst sustained heat has been happening in the West, but Southeastern states also are feeling the trend. Scientists are unsure how much higher the “new normal” temperatures might get.

Tried and true. Blown-in materials such as mineral wool, fiberglass or cellulose continue to be effective and affordable ways to reduce a home's energy footprint.

PREVENTING DAMAGE AND EXTENDING ROOF LONGEVITY

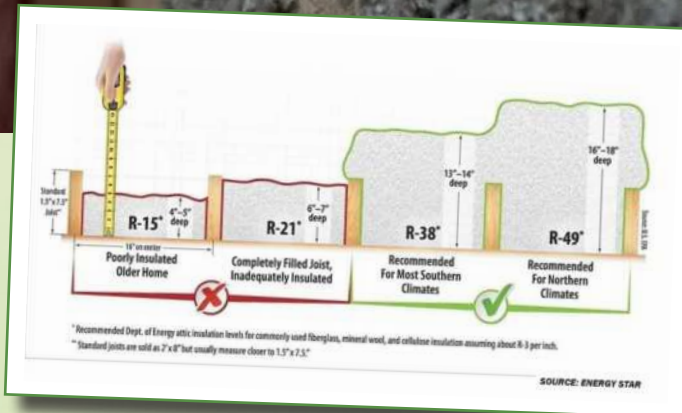
A study by the Lawrence Berkeley National Laboratory found that cool roofs can lower surface temperatures by up to 50°F (28°C) under peak conditions. In the context of rising temperature extremes, they offer roofing assemblies a “safety zone.”

First, they prevent shingles from reaching damaging temperatures. By maintaining surface temperatures closer to ambient air levels, they reduce thermal cycling, the repeated expansion and contraction of materials due to temperature changes. This, in turn, minimizes cracking and extends the functional life of shingles by several years.

Next, they protect traditional underlayments and roof decking. The materials beneath shingles, including some underlayments and roof decking, are susceptible to heat-related damage when temperatures hit extremes. For example, the resins in OSB begin to break down at about 200°F (93°C). It should be noted that some of the more modern underlayments can **handle higher heat**—up around 240°F—but felt paper may not.

Cool roofs clear a potential caveat about radiant barriers. Without reflective shingles, applying a radiant barrier on the underside of a roof could push roof assemblies into the red zone. By adding cool roofing, this affordable heat defense remains one of the best retrofit approaches to knocking down temperatures in attic spaces.

A simulated study of a residential attic in El Centro, California, by Oak Ridge National Laboratory, found that installing a radiant barrier in the attic of a home with a cool-colored shingle roof resulted in a 28.2 percent reduction in energy consumption compared to a conventional roof and attic assembly. This combination was found to be as effective as doubling the ceiling insulation from R-19 to R-38.



How deep? After you reach a maximum depth of various insulation materials, they no longer improve performance, in part due to compression. The benchmarks shown are ENERGY STAR targets, and may exceed locally adopted versions of building codes.

PHASE 2: GETTING ATTIC INSULATION RIGHT

Once you've got the roof deck and radiant barrier right, adding insulation will push your roof assemblies way into the green. If you're starting at a 28.2 percent reduction in heat gain due to cool roofing and radiant reflection, you should be able cut the home's overall energy footprint by 50 percent or more once you have added insulation to the attic.

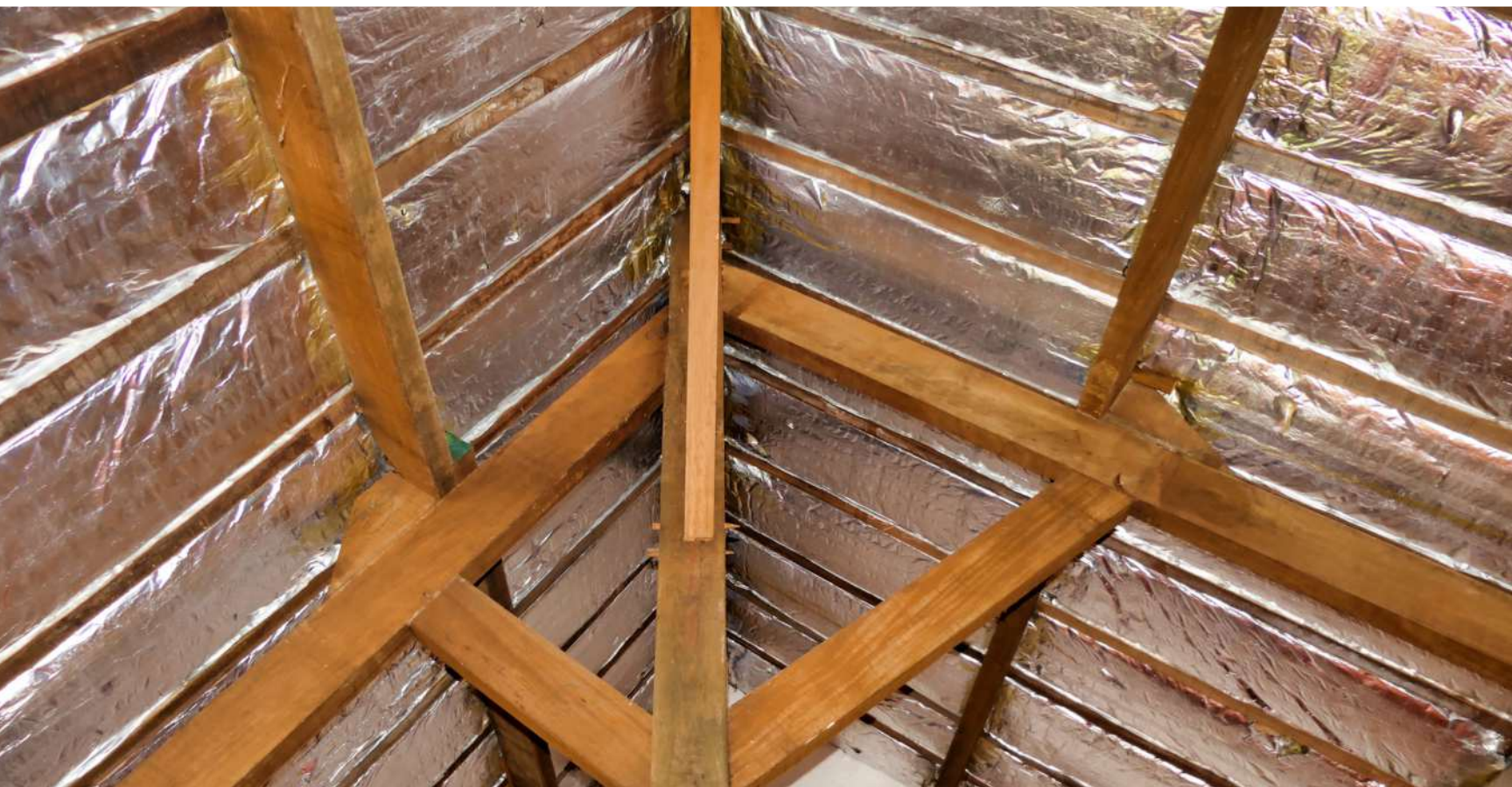
What's the best way to insulate attics? Good arguments can be made for vented and unvented methods, and the IRC now includes provisions for both types (see Chapter 8 of the 2021 International Residential Code [IRC], and Chapter 11 [Energy Efficiency]). When you introduce the criteria of affordability, however, the needle tends to shift toward more conventional, vented methods. This usually means using blown-in materials such as mineral wool, fiberglass or cellulose.

When it comes to selecting one type of blown-in product over another, the good news for builders is that if properly applied, they all perform well. In fact, as I [wrote about in detail recently](#), some of the negative rumors about cellulose are exaggerated or unsupported. It won't turn to dust. Nor is it fire prone. There are minor differences in product density among the different materials, however, as shown in the table below. **GB**

Insulation Type	Density (PCF)	Weight per Square Foot (10-inch thickness)	Notes
Loose-Fill Mineral Wool	1.5-2.5 PCF	1.25-2.1 pounds/ square foot	Heavier than fiberglass; fire resistant; soundproofing
Loose-Fill Fiberglass	0.4-1.0 PCF	0.35-0.8 pounds/ square foot	Lightest option, often used where structural load concerns exist
Loose-Fill Cellulose	1.5-3.5 PCF	1.25-2.1 pounds/ square foot	Similar to mineral wood in weight; provides excellent air sealing and dense packing

Density details. Assuming an R-value of about 3.1 per inch for cellulose, R-2.7 for loose fill fiberglass and R-4 for mineral wool, you would add different thicknesses to achieve a desired R-value—but all would do the job.

“Installing a radiant barrier in the attic of a home with a cool-colored shingle roof resulted in a 28.2 percent reduction in energy consumption compared to a conventional roof and attic assembly.”



RESILIENCE RISING

Easy option. Low-cost modular units like this one, priced at less than \$300, can easily be included as “perks” for new buyers, in lieu of hardscape kitchen arrangements. COURTESY OF OUTSUNNY



Focused Landscaping for Tighter Budgets

Since the pandemic, outdoor spaces have taken on larger significance (and budgets). Here are a few thoughts on how you can knock some of these costs down, while still offering buyers a flexible, desirable and nature-friendly backyard.

REPLACE BUILT-IN KITCHENS WITH MOVABLE OUTDOOR UNITS

Outdoor entertaining became a much bigger deal during the pandemic years, and our COGNITION research shows that homebuyers are still prioritizing multi-use backyards where they can barbecue, relax, and let the dogs run free.

Rather than high-end built ins, why not showcase your next model home with “gear”—flexible, movable kitchen pieces, furniture, cookers and even sinks? You’ll save cost on infrastructure (such as buried gas lines and waste plumbing), and your clients can still play in the sun.

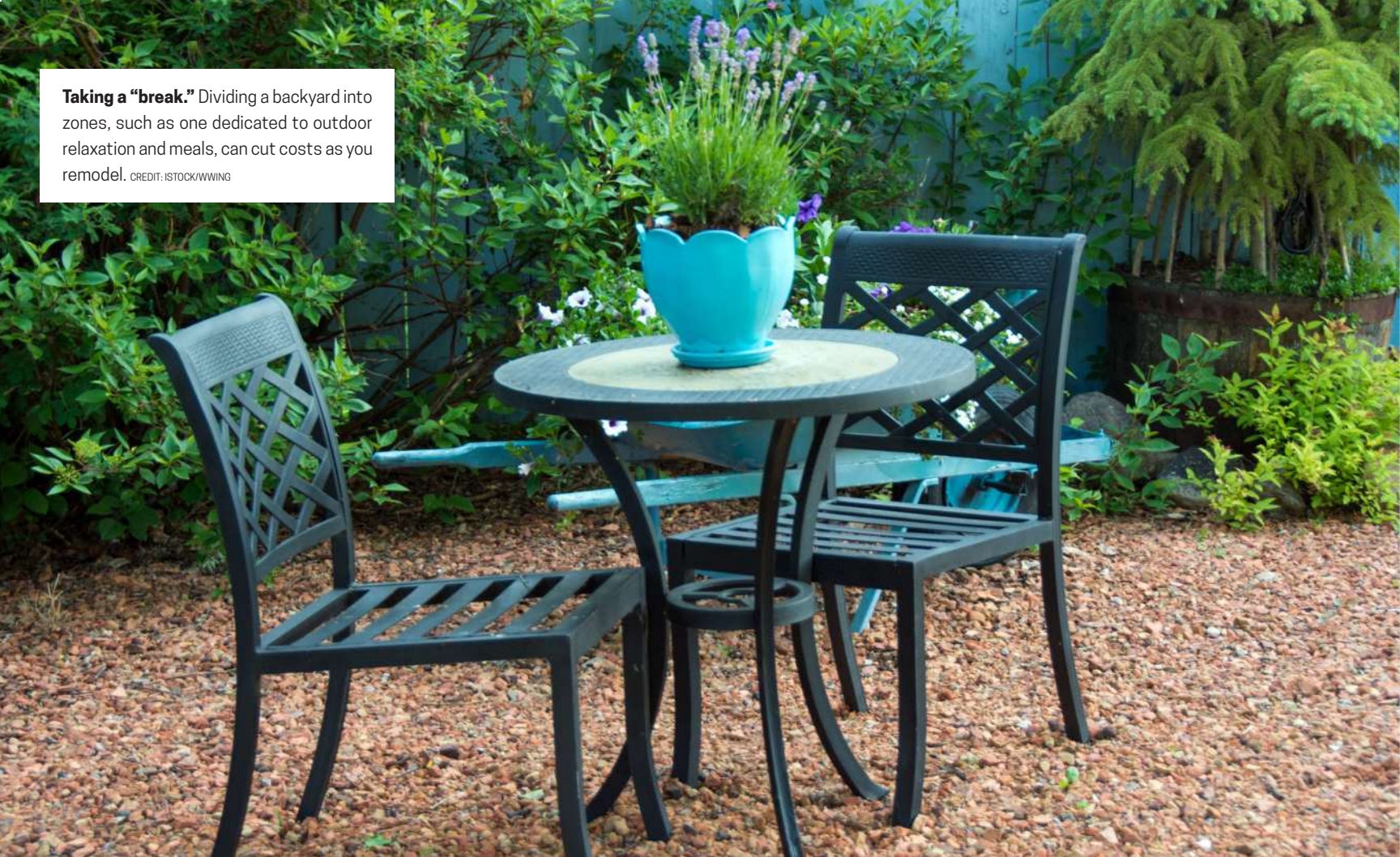
BREAK BACKYARDS INTO “ZONES”

Rather than lay down a lot of costly sod and its requisite underground sprinkler systems, conceptualize smaller, “jewel like” spaces such as individual patios, rock gardens and xeriscaping that require little maintenance. For example, zones might include:

- **Relaxation areas:** Incorporate hammocks or lounge chairs under shaded structures.
- **Dining spaces:** Designate areas with tables and seating for outdoor meals.
- **Gardening zones:** Include raised beds or vertical gardens for homeowners interested in planting.

For natural materials, look local. Crushed rock can usually be obtained nearby at reasonable cost, depending on the region. In Florida, crushed limestone is often an affordable ground cover.

Taking a “break.” Dividing a backyard into zones, such as one dedicated to outdoor relaxation and meals, can cut costs as you remodel. CREDIT: ISTOCK/WWING



Integrating smaller decks made with composite materials such as [Trex](#) can satisfy clients who expect some sort of deck area. Augmenting it with small details such as trellises or short sections of fence can have a big impact with a smaller outlay of cost.

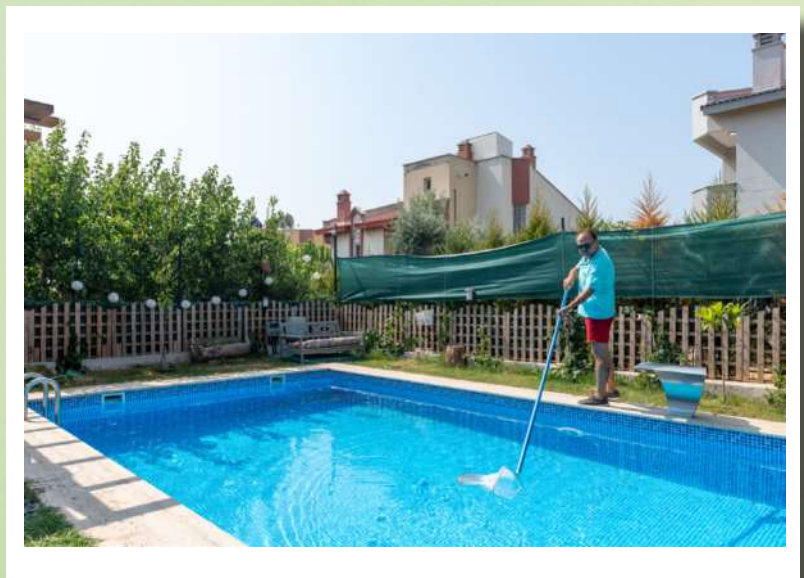
PASS ON THE POOL

Pools are fun. Some people consider them an essential amenity—but many buyers do not. The ROI on home pools is lousy. Owners pour thousands into them every year, and the maintenance never ends. The average in-ground pool costs \$35,000 to \$75,000 to install, then roughly \$4,000 to \$6,000 annually to maintain and operate.

Put those figures into context. When people buy a timeshare property, they typically spend about \$24,000 up front, and \$1,000 annually. Ask your clients: Is the pleasure you will get from that swimming pool equivalent to the value of owning multiple timeshare properties? Are there other ways they could imagine budgeting that money without such a high recurring cost?

Also, if you include the cost of adding a pool to a property, pools do not usually pay for themselves when the home is sold. They mitigate some of their initial cost, but not that much. The National Association of Realtors reports that homeowners recover about 56 percent of the pool's installation cost upon resale. If you give a timeline of 10 years, with a \$50,000 investment, a home's pool would need to increase the property value by approximately \$89,000. That's a big ask, particularly in a down market.

The bottom line: In markets where non-pool homes are common, you don't need to add one to attract buyers. Stick to other, more-affordable methods of enhancing backyard design. **GB**



Worth the effort? A swimming pool is an expensive and ongoing commitment, especially within a new home budget. CREDIT: ISTOCK/EMREOGAN

RESILIENCE RISING



Smart Home Integration—*A La Carte*

CREDIT: ISTOCK/THANADON NAKSANEE

Game changer. The rise of smartphone app interfacing has brought home technology on a budget into easier reach for homeowners.

If you're not already including numerous smart Wi-Fi features in even your most basic home models, you're missing an opportunity to add value without adding big costs.

I remember, 25 years ago, tagging along with a home automation installer on one of his custom jobs in southern Maine. Back then, making a home “smart” was a luxury reserved for the very high end of the market, and involved many hard-wired modules, touch screens and specialized expertise. Clients came to my installer looking for home theaters, not energy efficiency.

Those days are long past. Thousands of Wi-Fi-enabled home products are available, many of them simple to install. The problem of different platforms still exists but has been mitigated greatly by the smartphone. Phones have become the *de facto* remote control for almost every piece of smart-enabled equipment. That's good news for builders and their trades.

Also, a lot of products, even those by different manufacturers, can be unified through platforms like *Apple HomeKit*, *Google Home*, or *Samsung SmartThings*. There's still a place for super-turnkey smart systems such as Panasonic's new *OASYS* platform, particularly in higher-end homes, but the little guys have a foot in the door, too.

In other words, if you're squeezing your construction budget but want to offer a “smart” home, you can mix brands on smart-enabled products. For example, you may run the heat pumps with a Carrier thermostat, run a Rheem hybrid heat pump with its *EcoNet* app, and add a low-cost interconnected fire protection system from *X-Sense*. Buyers are familiar with apps (for the most part), so it's not a hard sell to demo house controls on their own phones, making them feel like they're in control when the house is complete.

Let's take a hypothetical new house—“Efficient 2K”—and break down how you might employ smart systems at a modest cost.





THE “EFFICIENT 2K” SMART HOME PLAN

HOUSE PROFILE:

- 2,000 square feet
- 3 bedrooms / 2.5 baths
- All-electric
- Tight building envelope
- Ducted mini-split HVAC with ERV
- Central smart home hub and mobile app integration

Here’s how our affordable smart home might be actualized:

A. SMART THERMOSTAT: THE BRAIN OF CLIMATE CONTROL

What it does:

Adjusts heating and cooling based on occupancy, time of day, and even weather forecasts. Learns patterns over time.

Product examples:

Nest thermostat or ecobee *Smart Thermostat Enhanced*—around \$130-\$190. [Other products from Uponor](#) can also control radiant heating and cooling.

Energy impact:

Up to 10 percent savings on heating and 15 percent annually on cooling (EPA estimate).

Why it works for builders:

Easy to install, integrates with most systems, and intuitive for homeowners.



Early riser. Nest thermostats were one of the first on the scene to “learn” from behavior.

CREDIT: COURTESY OF NEST

CREDIT: ISTOCK/PHOTOSCHMIDT

B. ROOM SENSORS: PRECISION WITHOUT WIRES

What they do:

Track temperature, humidity, motion, and occupancy in each room.

Placement:

Bedrooms, main living space, and home office (3-5 total).

Product examples:

ecobee room sensors or Aqara Zigbee sensors —\$25-\$40 each.

Energy impact:

Improves comfort without overheating or overcooling underused areas.

Bonus:

Enables zoning-like behavior without expensive zoning systems.



Plethora. Tech companies continue to expand low-cost sensor and hub options. These devices from Aqara work with the Zigbee 3.0 hub. CREDIT: COURTESY OF AQARA

C. SMART DOOR KEYPADS + LOCK INTEGRATION

What they do:

Keyless entry with user codes; can trigger “away” mode to reduce HVAC and turn off lights when no one is home.

Product examples:

Schlage Encode or Yale Assure Lock 2—\$150-\$250.

Why it matters:

Boosts security and helps automate energy savings when the house is unoccupied.

Inter-actor. The Schlage Encode smart lock can be controlled remotely and with other gadgets such as smart watches and smartphones.

CREDIT: COURTESY OF SCHLAGE



D. WHOLE-HOME SMART LIGHTING (ZONED OR SCENE-BASED)

What it does:

Allows homeowners to create scenes like “Evening,” “Away,” or “All Off.” Controlled via app, voice, or wall switches.

Approach:

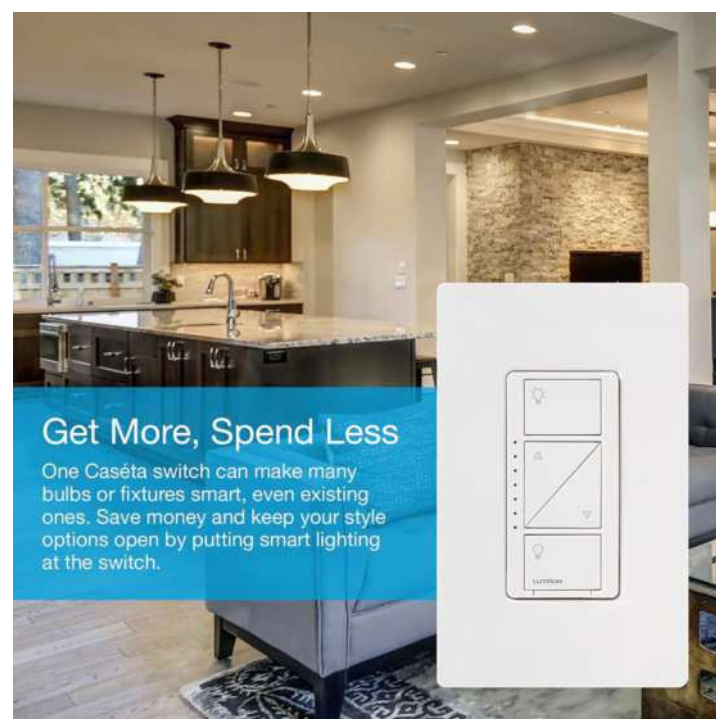
Focus on living spaces, kitchen, and exterior lights—15-20 key fixtures.

Cost estimate:

Using smart switches (such as Lutron Caséta): \$60-\$80 per switch.

Why it works:

Simplifies control and saves power. Scene setting is more intuitive than individual bulb control.



Easy lift. Lighting controls are becoming more widely available and easy to install, including those from established brands such as Lutron. CREDIT: COURTESY OF LUTRON

E. SMART PLUGS + APPLIANCE MONITORING

What they do:

Measure and control energy use of key appliances (e.g., coffee maker, media center, space heaters).

Where to use:

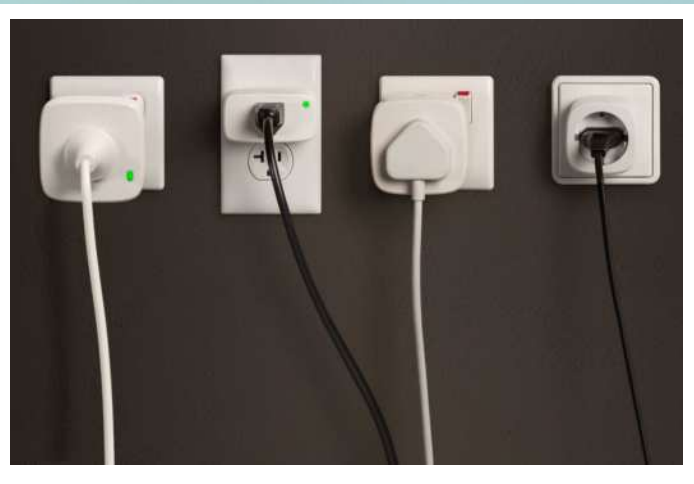
TVs, home office equipment, and other always-on devices.

Product examples:

TP-Link Kasa or Eve Energy smart plugs—\$20-\$30 each.

Builder benefit:

Easy to install and show off during walkthroughs. Homeowners can see real-time energy use.



On or off? Smart plugs offer remote control over energy waste and low-budget security. CREDIT: EVE ENERGY

F. HVAC + VENTILATION DASHBOARD

What it is:

A simple, centralized dashboard (via app or touchscreen panel) that combines HVAC, ERV/HRV, and humidity controls.

Why it’s needed:

Most homes have poor ventilation management. These systems link fresh air with comfort, tying air quality to ventilation activation and climate control.

Product examples:

Panasonic OASYS (for larger budgets); Broan-Nutone *Overture* for mid-range installations (approximately \$2,000 for a basic system).

User benefit:

Enables homeowners to fine-tune air quality without becoming HVAC experts.

G. LEAK + FREEZE SENSORS IN RISK ZONES

Placement:

Under sinks, near water heater, basement sump pit.

Function:

Alerts homeowners if water is detected—critical in cold climates or vacation homes.

Product example:

Flo by Moen, approximately \$700 installed.

Value add:

Protects the home and helps insurance discounts in some states.

Double protection. Leak detectors not only identify and in some cases shut off leaks, but they also lower insurance premiums by as much as \$500 annually.

CREDIT: COURTESY OF MOEN



WHAT IT COSTS: A ROUGH BUDGET			
SMART FEATURE	QUANTITY	COST PER UNIT	ESTIMATED TOTAL
Smart Thermostat	1	\$150	\$150
Room Sensors	4	\$30	\$120
Smart Door Lock	1	\$200	\$200
Smart Switches (Lighting)	15	\$70	\$1,050
Smart Plugs	5	\$25	\$125
Leak Detection System	1	\$700	\$700
HVAC Smart System	1	\$2,000	\$2,000
Integration Hub/App	1	\$0–\$100	\$100 (max)

For about \$4,265 (a very rough approximation for illustration purposes), builders can deliver a full-featured smart home energy system with tangible benefits to the homeowner—and a compelling selling point in competitive markets. Integration hubs such as Alexa, Samsung *SmartThings* or hard-wired control panels from **Brilliant** can unite many apps under one interface. **GB**

| RESILIENCE RISING |

Easy does it. SIPs are pre-sized panels with little waste that go up quickly on the jobsite, at a price competitive with installed lumber wallsents. CREDIT: ISTOCK/BRIZMAKER



Alternative Structural Systems

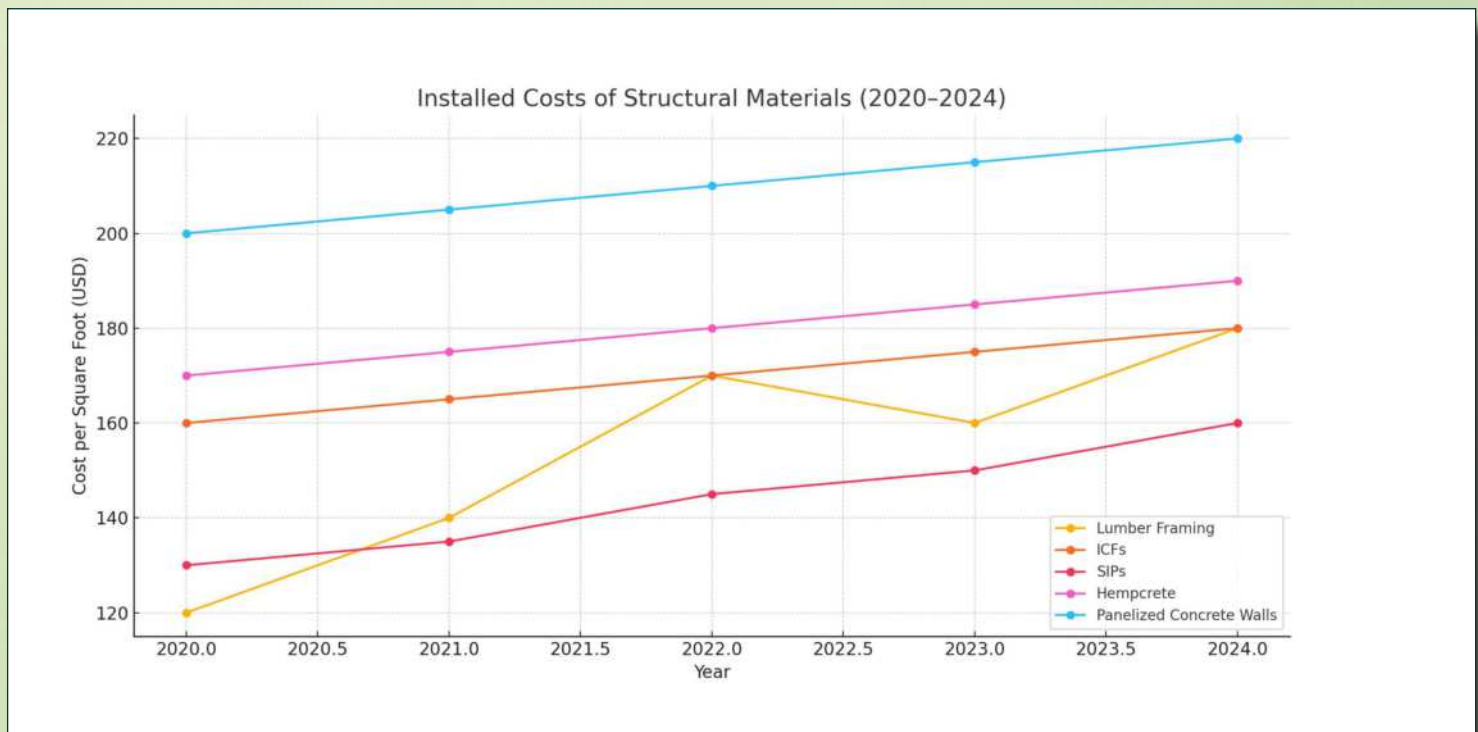
Framing lumber costs are high, and may go sky high in coming months, if Canadian tariffs take effect. Several alternative structural systems are on price parity or approaching that threshold against wood framing.

According to the National Association of Home Builders (NAHB), as of April 2025, framing lumber prices have risen to \$483 per 1,000 board feet, marking a 23.5 percent increase over the past year. Concurrently, Canadian softwood lumber, which supplies approximately 30 percent of the U.S. market, is subject to a 14.54 percent tariff. Potential increases could raise this to 27 percent or more by late 2025.

That huge price hike has closed the gap between lumber and structural systems such as insulating concrete forms (ICFs), structural insulated panels (SIPs), hempcrete, and panelized concrete walls.

The installation costs for alternative systems have risen more steadily:

- ICFs: ~\$180/square foot
- SIPs: ~\$160/square foot
- Hempcrete: ~\$190/square foot
- Panelized Concrete Walls: ~\$210/square foot



Upward mobility. Remember lumber prices during the pandemic? When you factor in installation, we're almost back at those heights again, with more Canadian tariffs still being discussed. This graph shows how alternative systems have risen in price, yes, but in a more predictable pattern reporting.)



Natural favorite. We've seen a lot of interest lately in hempcrete construction. To learn more about it, visit the Natural Building Alliance.

CREDIT: NATURAL BUILDING ALLIANCE

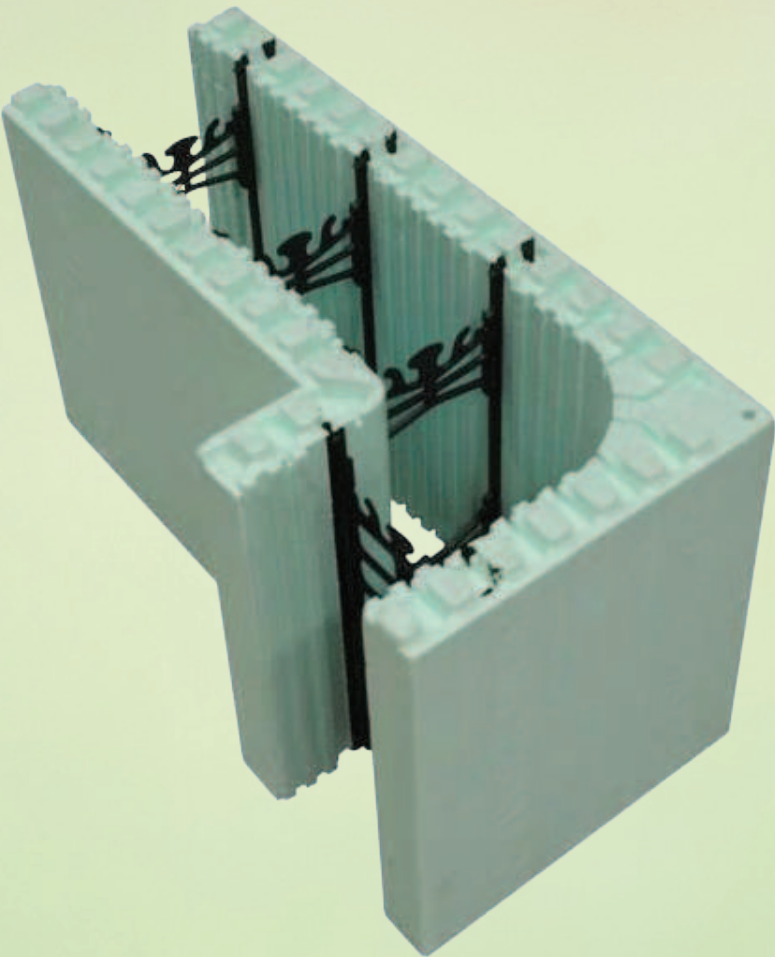
For clarity, here’s a price comparison of popular alternative envelope systems with wood framing at current levels of inflation. If more tariffs come into play, other alternative systems could achieve price parity with lumber.

STRUCTURAL INSULATED PANELS (SIPS):

Installed at about \$160/square foot, SIPs are now cheaper than lumber framing on a total cost basis. Faster build times and tighter energy envelopes offer even more savings long term.

INSULATING CONCRETE FORMS (ICFs):

At about \$180/square foot, ICFs are running neck-and-neck with lumber costs, but like SIPs, they have an ace up their sleeve. They come with energy efficiency advantages that can cut HVAC demand by up to 60 percent annually over stick-framed equivalent homes.



Insulating advantage. ICFs offer excellent insulating properties, and they stand up well to climate disasters. CREDIT: NUDURA

HEMPCRETE SYSTEMS:

At roughly \$190/square foot, hempcrete remains a premium product, but offers major carbon footprint and indoor air quality benefits. It costs a bit more to use as a structural material because it needs additional reinforcement for load bearing.

PANELIZED CONCRETE WALLS:

At \$210/square foot, panelized concrete walls are the highest-cost option—but they deliver resilience, durability and rapid installation times that could pay off in specific markets.

Let’s look at a couple of other “apples-to-apples” comparisons of these structural systems.

Energy Savings Comparison		
STRUCTURAL SYSTEM	ESTIMATED ANNUAL ENERGY SAVINGS	NOTES
Framing Lumber	Baseline (0%)	Standard insulation practices
SIPs	40-50%	High R-values; tight building envelope
ICFs	50-60%	Mass wall effect reduces HVAC loads
Hempcrete	30-40%	Moderate insulation + thermal inertia
Panelized Concrete	20-30%	Depends on the insulation layers added

Extra credit. Each of the alternative systems listed offers a bump up in wall performance over conventional stick-framed walls with code-minimum insulating batts.



CREDIT: ISTOCK/WELCOMIA

LABOR COMPARISON		
STRUCTURAL SYSTEM	RELATIVE BUILD SPEED (VS. TRADITIONAL FRAMING)	NOTES
Framing Lumber	Baseline (0%)	Highly labor dependent
SIPs	30-50% faster	Panels prefabricated; minimal framing needed
ICFs	10-25% faster	Simple stacking + pour process
Hempcrete	20-30% slower	Labor intensive; drying time needed
Panelized Concrete installation	50-70% faster	Precast panels; crane installation

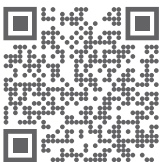
For builders in the high-performance space, these estimates may be familiar. But the dramatically shifting costs of softwood lumber make them more relevant than ever. Lumber volatility from tariffs over the long term, combined with threats to the industry’s hard-working immigrant labor force, is likely to push more builders toward faster, more insulating wall systems that require fewer labor hours. **GB**

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CROSSING THE RUBICON:

A NEW ERA OF SUSTAINABILITY RISES IN THE DESERT

VISION House®
LASVEGAS
Crossing the Rubicon



A grand goal. VISION House Las Vegas: Crossing the Rubicon, a collaboration between Beazer Homes and Green Builder Media, represents an effort by Beazer to build all of its homes to the Department of Energy (DOE)'s Zero Energy Ready Home (ZERH) standards. CREDIT: LAWRENCE MONIS

Putting sustainability front and center in a model home represents a step forward—or more like a leap forward—for production building. At the 2025 International Builders Show (IBS), builders, manufacturers, architects, contractors, real estate agents and consumers had their first opportunity to see VISION House Las Vegas: Crossing the Rubicon, a collaboration between Beazer Homes and Green Builder Media. The project, which includes three model homes in the Aria Crossing neighborhood in the planned community of Henderson, Nevada, represents a milestone moving toward all Beazer Homes

being built to meet the Department of Energy (DOE)'s Zero Energy Ready Home (ZERH) standards.

“While some large public builders have taken steps toward including energy efficient features in their homes, we are proud to have 100 percent commitment that every home being built by the end of 2025 will be ZERH certified, not just in Las Vegas, but in all 16 of our markets,” says Kyle Tibbitts, division president of Beazer Homes Las Vegas. “We see the need to ensure that families in our homes are living healthier lives – and we are excited to continue to build [ZERHs] at a large scale.”

The VISION House Las Vegas project includes three model

A grand vision for production building is revealed at the International Builders Show.

BY MICHELE LERNER



homes: Vision, a base model; Aurora, an “upgraded” home; and perhaps most intriguing, Nexus, a “deconstructed” model. The base model is part of Beazer Homes’ READY Series, which includes ZERH certification, Indoor AirPlus qualification, and ENERGY STAR certification, ensuring high-performance, healthier living.

The upgraded model pilots sustainable features such as Sherwin-Williams air-purifying paints and solar panels that offset 100 percent of energy usage. The deconstructed model peels back the drywall and showcases the products and systems that represent a new level of energy efficiency, healthy living and sustainability for a production builder.

Excessive idea. Sunnova’s solar panels and battery storage enable homeowners to manage their energy consumption and be resilient to power outages. CREDIT: LAWRENCE MONIS



Wall warrior. Sherwin-Williams' air-purifying, interior acrylic latex *SuperPaint* can be found throughout the house. CREDIT: LAWRENCE MONIS



Solid service. Westlake Royal's high-performance tile roof contributes to energy savings, while its *Cultured Stone* manufactured stone product offers a low-maintenance and highly decorative way to dress up the front or back of the home.

CREDIT: LAWRENCE MONIS

"We've invited groups of real estate agents to tour the deconstructed model, helping them grasp all of the building science layered into our homes," says Dave Reid, vice president of sales at Beazer Homes Las Vegas. "Our partners and manufacturers have also responded positively to the deconstructed house—it's exciting for everyone to see how all the components contribute to the final product."

Thanks to the positive reaction from other builders, their trade partners and customers, Beazer plans to build an additional deconstructed house in another market, Tibbitts says. "It has really helped our trade partners understand how their piece of the puzzle fits together with the rest of the products and systems in the house," he notes.

For other builders, the VISION House project provides proof that it's possible to build a ZERH at an attainable price, Reid says.

"I often find that national or tract builders just barely meet the code in terms of their building standards, so what impresses me the most is that a company as large as Beazer has made this commitment to sustainability," says Rob Howard, president of Howard Building Science, Inc. in Granite Falls, N.C. "I was really impressed by [Beazer Homes CEO] Allan Merrill, who seems like an inspirational leader, and by Beazer employees' exuberance about this project."

ATTAINABLE SUSTAINABILITY ON DISPLAY

While Beazer is building its ZERHs throughout the U.S., residents in the Las Vegas area feel the next-level sustainability of these homes is particularly relevant.

"Developing energy-efficient homes is crucial for reducing greenhouse gases, as one-third of all emissions in Southern Nevada are attributed to electricity used in buildings," says Tory Jackson, sustainability and climate manager for the City of Henderson. "It is exciting to have the VISION House here in Henderson showcasing these sustainability elements. These educate and encourage our residents to make more climate-conscious choices in where and how they live."

Beazer Homes' commitment to sustainability is "truly exceptional," which is why the Southern Nevada Home Builders Association (SNHBA) recognized the builder with its Sustainability Award at its 2024 Installation Awards, says Tina M. Frias, CEO of the SNHBA in Las Vegas. Frias believes the VISION House project serves as a well-executed example of how home builders are innovating to meet environmental goals and the needs of homebuyers.

"The project thoughtfully incorporated sustainable, user-friendly products, such as high-quality electric kitchen appliances designed with safety features—especially for families with young children," she says. "Every detail was carefully considered, from product



Finding “Sanctuary.” A tight building envelope is enhanced by Greenfiber’s cellulose insulation, which is made from 85 percent recycled post-consumer paper fiber. CREDIT: GREEN BUILDER MEDIA/SAMANTHA CARLIN

Good for groups. *PureTech* flooring from Mohawk, which has 70 percent recycled content with an organic core of 80 percent renewable plant-based material, is installed throughout the living areas of each home.

CREDIT: GREEN BUILDER MEDIA/SAMANTHA CARLIN

selection to pricing plans that keep homes priced within reason.”

Dean Larkin, an architect and principal of Dean Larkin Design in Los Angeles, visited the model homes during the IBS. He was especially impressed by the deconstructed model home and the fact that Beazer was able to build these highly efficient homes at a price point that makes them accessible to more than just those who can afford a custom home.

“It was brilliant of Beazer to ‘peel away’ the layers to reveal everything they have done to push the sustainability envelope,” Larkin says. “The home itself seems quite unimposing from the outside, which of course was the idea.”

Larkin spoke with Beazer executives, and they shared some of the challenges they faced building these homes, such as the size of the windows and doors.

“I showed them one of our projects and told them we didn’t have that problem,” says Larkin, who builds high-end custom homes. “But we don’t have the budget restraints they do—truly a remarkable achievement at that price point. What really stood out to me was the spirit and dedication of the Beazer group. Only with that can a home like that exist. Kudos to them.”



Controlling force. The SPAN electrical panel, part of the connected smart home system, allows homeowners to understand, monitor and manage energy use. That includes appliances such as the Rheem Proterra hybrid electric heat pump water heater, which uses about 75 percent less energy than a traditional model. CREDIT: LAWRENCE MONIS; GREEN BUILDER MEDIA/SAMANTHA CARLIN.

EXCEPTIONAL FEATURES

Howard, who describes himself as someone who “geeks out” at tech-driven features, was impressed by the mechanical room and the garage.

“I had read about Span’s electrical panel, but I hadn’t seen it installed ‘in the wild’ before,” Howard says. “Other builders sometimes do a ‘truth wall’ with an explanation of how something works in a model home, but the deconstructed home and the mural in the garage go far beyond that to explain how these systems work together.”

Even though not every builder can meet ZERH standards right away, Howard feels that the VISION House Las Vegas demonstrates some entry points builders can consider.

“One thing everyone can do is figure out how to get the mechanical systems inside the building envelope,” Howard says. “It’s best to get it into a mechanical closet or encapsulated in the attic.”

Converting to all-electric homes and installing highly energy efficient HVAC systems are also realistic goals for all builders, Howard suggests.

Given the desert climate, it’s natural that Frias was particularly impressed by the energy efficiency of the VISION House homes, particularly their airtight construction, which significantly reduces air leakage.

“This helps maintain indoor temperatures more effectively,

lowering the energy needed for heating and cooling while improving the overall performance of the HVAC system,” Frias says.

One reason the VISION Las Vegas model homes successfully demonstrate a path towards ZERH standards is that the products and systems work together. From the building envelope to the smart home features to the floors, fixtures, tiles and paint, each product adds to the sustainability of the finished homes.

The homes are constructed with DuPont Tyvek flashings and tapes for a tight building envelope, which is enhanced by Greenfiber’s cellulose insulation, made from 85 percent recycled post-consumer paper fiber. Overhead, the Westlake Royal Cool Roof System, which adds ventilation and energy efficiency to each home, is topped with the company’s highly durable Newpoint Concrete Roof Tile, designed to stand up to the harsh desert climate. The exterior of the home also includes Westlake Royal’s Cultured Stone manufactured stone product.

Solar panels and battery storage from Sunnova provide homeowners at Aria Crossing with the ability to manage their energy consumption and be resilient to power outages.

Recycled steel garage doors from Windsor America, which has reduced its scrap steel by 20 percent within one year, contribute to the low carbon footprint of the VISION House. LiftMaster’s MyQ system provides smart home accessibility and security for the garage.



Repurposed performers. Daltile-provided walls and floors in the bathrooms contain recycled materials. Meanwhile, Moen provides smart water conservation products such as low-flow fixtures and faucets, and Organized Living supplies sustainably produced shelving.

CREDIT: GREEN BUILDER MEDIA/SAMANTHA CARLIN



Electric goodness. Energy-efficient appliances, such as the dishwasher, induction stove, oven and microwave make Whirlpool a household name in more ways than one.

CREDIT: GREEN BUILDER MEDIA/SAMANTHA CARLIN

Smart home features at Aria Crossing provide homeowners with the connected living they crave. Homeowners will be able to manage their HVAC use with Resideo's smart thermostat. Resideo's smart alarm systems connect compatible smoke and carbon monoxide alarms throughout the house for greater safety.

The SPAN electrical panel, part of the connected smart home system within the homes, allows homeowners to understand, monitor and manage energy use. Energy use will naturally be lower in the homes because of the way they are built along with the installation of energy efficient appliances such as the Rheem Proterra hybrid electric heat pump water heater, which uses about 75 percent less energy than a traditional water heater. Energy-efficient appliances from Whirlpool in the homes include an induction cooktop and a heat pump dryer.

Indoor air quality is enhanced with Broan-NuTone's ERV and its Evolve continuous run exhaust fan, which together automatically monitor and clean the air in the homes. Sherwin-Williams SuperPaint with Air Purifying Technology not only provides a low-VOC product to avoid bringing chemicals into the homes, but the new technology also provides a surface that breaks up odors, reduces VOCs from fabrics and carpets, and inhibits the growth of mold and mildew.

Inside, the products and systems not only enhance the comfort and livability of the homes but also add to their beauty. PureTech

flooring from Mohawk, made from 70 percent recycled content with an organic core of 80 percent renewable plant-based material, is installed throughout the living areas of each home. The flooring is scratch-resistant and waterproof for durability.

The kitchen counters and tile walls and floors in the bathrooms are all provided by Daltile, a company whose commitment to sustainability means that more than 99 percent of its tile collections contain recycled materials. In addition, Daltile recovers and reuses 84 percent of all processed wastewater generated in its manufacturing plants to make tile products.

Moen, a long-time partner with Beazer Homes, provides smart water conservation products, including low-flow fixtures and faucets in the VISION House that are particularly important for the Las Vegas desert climate. The Smart Irrigation System monitors water needs in up to eight sprinkler zones to minimize water waste. In addition, the Flo Smart leak detection system with an automatic shut-off prevents water damage and conserves water by alerting homeowners to slow leaks.

The upgraded model at the VISION House showcases closet installations from Organized Living, a company that prioritizes sustainability in its storage systems and sources materials exclusively from FSC-certified and TSCA-compliant wood suppliers, contributing to healthier homes.



Doing ‘well’. Resideo’s *Honeywell 300* smart thermostat enables homeowners to carefully and efficiently manage HVAC use.

CREDIT: GREEN BUILDER MEDIA/SAMANTHA CARLIN



A winning team. Indoor air quality is enhanced with Broan-NuTone’s ERV and its *Evolve* continuous run exhaust fan, which automatically monitor and clean the air.

CREDIT: GREEN BUILDER MEDIA/SAMANTHA CARLIN

MOVING FORWARD FOR SUSTAINABILITY

Beazer has elevated its commitment to build every home in every community to ZERH standards going forward, which Frias says is significant, but not surprising.

“Builders in our market continuously pursue the latest designs, efficiencies and effective utilization of limited land,” Frias says. “Their goal is to create homes that balance sustainability and affordability while meeting the needs and lifestyles of today’s buyers. By staying attuned to these priorities, they attract more people to the communities in which they build.”

The VISION House Las Vegas symbolizes Beazer’s full commitment to building ZERHs going forward.

“We are passionate about ensuring the health and wellness of our homeowners, but it can be challenging to articulate everything that we include in our homes without a visual,” Reid says. “We plan to use the VISION House project as a springboard to let people know how we build our homes.”

Ideally, all builders should look at what they’re doing and always build the way Beazer does, Howard says.

“The reality is that we are turning a battleship here, so it will take time,” he says. “Beazer is really moving everyone forward. I hope all the bigger builders are inspired by them.” **GB**



Intelligent actions. LiftMaster’s *myQ* system provides smart home accessibility, while Windsor Door’s ultra-durable garage door improves security for the garage.

CREDIT: GREEN BUILDER MEDIA/SAMANTHA CARLIN



Here's What Make the VISION House Green

Broan NuTone: [Broan® AI Series™ 150 CFM Energy Recovery Ventilator \(ERV\) Model: B150E75NT](#)

Cultured Stone: [Manufactured stone solutions](#)

Daltile: [Countertops and wall tiles](#)

DuPont: [Tyvek® DrainWrap™](#) water-resistive barrier, [FlexWrap](#) and flashing tape

Evolve Premium Exhaust Fan w/ Continuous Run, 110-130-150 Selectable CFM Model: PTE115RK (available in both lit and non-lit)

Greenfiber: [Sanctuary](#) insulation

LiftMaster: [myQ](#) garage door operators

Moen: [Reverse Osmosis Filtration](#) system, [Smart Irrigation](#) system, [FLO Smart Water Shutoff](#), leak detection

Mohawk: [PureTech](#) resilient flooring

Organized Living: [Freedom rail](#) and [Select](#) storage shelving systems and carpet

Resideo: Smart home system including [BRK's Smart Interconnect System](#)

Rheem: [Proterra Hybrid Heat Pump Water Heater](#)

Sherwin-Williams: [SuperPaint with Air Purifying Technology](#)

Span: [Energy Management System](#)

Sunnova: [Sunnova](#) solar panels and [battery storage](#)

Westlake Royal Roofing: [Newpoint Concrete Roof Tile](#) cool roof system

Whirlpool: [Electric appliances](#)

Windsor: [Garage doors](#)



CREDIT: COURTESY OF DUPONT

Meeting New Standards with Styrofoam

As of January 1, 2025, builders have been required to upgrade insulation levels and energy efficiency to meet higher ENERGY STAR for Homes certification standards. One simple option, used in most Beazer Homes, is to install continuous insulation, such as [DuPont Styrofoam Brand XPS Insulation](#). DuPont's Styrofoam helps reduce heat loss from conduction through wood framing when installed on the exterior, as well as reduce the chances of internal condensation.

[Styrofoam Brand XPS Insulation](#) is closed cell insulation, which absorbs less water over time than EPS foam insulation. Absorbed water can cause damage in freeze/thaw conditions, which is particularly important in cold climates. In humid or stormy climates where moisture is present, the product maintains a higher R-value than EPS insulation.

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THE SMART WAY TO INSULATE: GREENFIBER'S SUSTAINABLE SOLUTION

CHALLENGE

Building codes are evolving, and so are the expectations of homeowners. To stay ahead, builders need insulation solutions that check all the boxes: code compliance, energy efficiency, sound control, and affordability. But misconceptions about cellulose insulation—like settling and installation complexity—can cause builders to default to less effective, better-known materials.

SOLUTION

Step inside VISION House Las Vegas, and you'll notice it immediately: the hush, the steady temperature, the sense that the outside world has been gently muted. That's the power of **Greenfiber's SANCTUARY® insulation**. Blown into walls, ceilings, and attics, SANCTUARY wraps the home in a dense, protective layer that seals gaps, softens sound, and locks in comfort.

Unlike traditional insulation, SANCTUARY fills every cavity completely—achieving a Grade 1 installation the first time. It helps builders meet tough Energy Star 3.2 and IECC 2021 standards while giving homeowners up to 25% lower energy bills and 60% less outside noise.

And it doesn't just feel good—it does good. Made from 85% recycled paper, SANCTUARY carries a verified Environmental Product Declaration (EPD) and sequesters carbon for the life of the home. The average home that is insulated with SANCTUARY locks up 3.8 TONS of CO₂. That's equivalent to planting 8,400 trees!*

With national distribution and pricing on par with fiberglass, it's a smarter choice for high-performance projects like the VISION House—and for the families who live in them.

IMPACT

For builders, SANCTUARY® streamlines the installation process, ensuring a quicker, more efficient build. Its easy application—whether as dense-pack or wall-spray—helps teams get it right the first time, reducing the need for touch-ups and keeping projects on track. With SANCTUARY, builders can meet stringent energy efficiency targets without worrying about costly installation issues or delays.

SANCTUARY helps builders hit blower door targets of 3 to 5 ACH50 on the first try. Designed to integrate seamlessly into existing assemblies, envelopes, and plans, it fills the small joints, crevices, and gaps in attics, walls, floors, and ceilings. The result is a dense, high-performance barrier that cuts air infiltration, dampens sound, and improves thermal performance.

Homeowners feel the difference immediately, with improved comfort and a noticeable reduction in outside noise. The seamless insulation helps maintain a consistent temperature year-round, creating an environment that's quieter and more energy-efficient, with less reliance on heating and cooling systems.

SANCTUARY is a smart choice for builders and homeowners who want to get the job done right from the start, with long-term value built in.



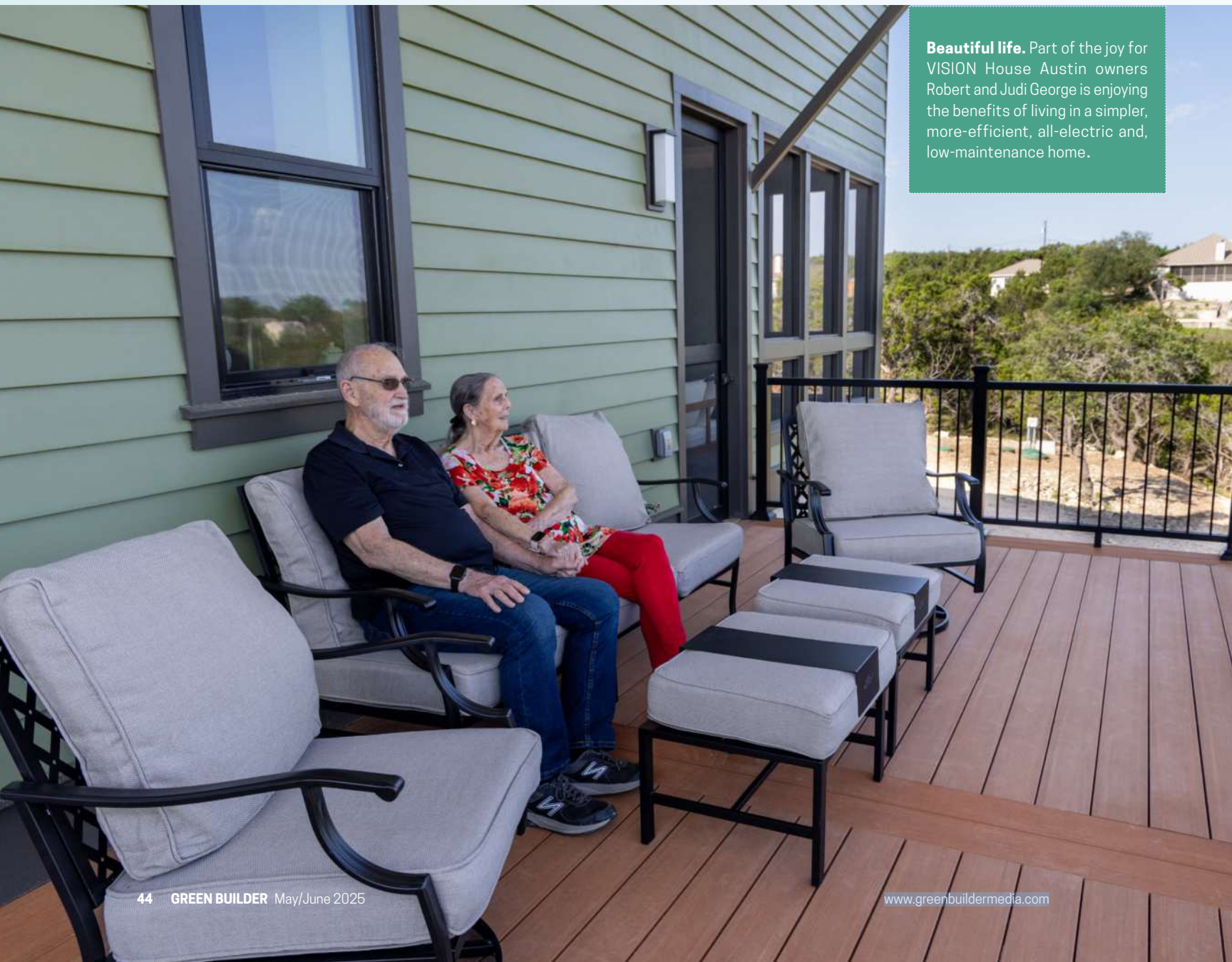
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A PLACE OF PEACE

Design, products and systems work in harmony with a sustainable home that meets the challenge of Austin's harsh climate.

BY MICHELE LERNER

Beautiful life. Part of the joy for VISION House Austin owners Robert and Judi George is enjoying the benefits of living in a simpler, more-efficient, all-electric and, low-maintenance home.





ALL PHOTOS BY SAMANTHA CARLIN



www.greenbuildermedia.com

All inclusive. VISION House Austin is a custom home that showcases the best in climate-resilient design, as well as being all electric and net zero energy, healthy, smart and solar powered.

When it comes to partnerships, Robert and Judi George, owners of the VISION House Austin, could hardly be better suited to work with Peter Pfeiffer, Alan Barley and Joel Effland of Barley|Pfeiffer Architecture, and Justin Moore, owner of White Elephant General Contractors in Austin. The Georges share a lifelong dedication to sustainability and wanted their custom home to showcase the best in climate resilient design, as well as a floorplan that is conducive to aging in place in a net zero energy home that's all electric, healthy, smart and solar powered.



Integral resilience. James Hardie cement siding—a long-lasting and fire-resistant product—can handle Austin's extreme heat, making the home thermally superior.

In partnership with Green Builder Media, Pfeiffer and Barley designed a home that responds to the Austin climate and the site's individual characteristics. Careful placement of overhangs to reduce solar heat gain, a screened porch to catch breezes, and a floor plan that places spaces used less often in the daytime on the western side of the house created a home resilient to Austin's extreme weather.

As house plans progressed, products and systems were chosen to complement the design and work together to achieve the long-term goals of the owners. "We knew from the beginning that we wanted James Hardie siding for the exterior of the house because it's a durable product that's kind of the gold standard for builders," Moore says.

Hardie fiber cement siding, which is manufactured specifically to meet climate challenges in different regions of the country, is long lasting and fire resistant—an increasingly important characteristic in the Austin area. The Georges' house features Hardie *Artisan* lap siding, which Effland says is about three times as thick as the standard Hardie siding. It adds shadows, depth and texture for a beautiful exterior. Hardie V-groove siding is used as accent material on the screen porch and entry porch.

NEXT-LEVEL ENERGY SAVINGS

Once Barley and Pfeiffer designed the Georges' house to respond to its site and environment, building the house to achieve the highest performance levels was the next priority.

Henry, a Carlisle company, provided its *Blueskin VP100* product, a weather-resistive barrier that eliminates air gaps, self-seals around nails and fasteners, and prevents water and moisture intrusion for the building envelope. Henry products used at the VISION House, such as *Blueskin ZeroFlash* and closed-cell spray foam insulation *Seal-Tite*, are designed for extreme temperatures, to prevent pest infestations, and reduce moisture and mold issues that are common to the humid climate in Austin. *Blueskin ZeroFlash* is impermeable to water, air and moisture intrusion. It can be installed without primer, seals around nails and fasteners for watertightness, and allows flashing to remain in place without mechanical fasteners.

"Henry's products were new to us, so we were happy to try them out and discover that the result was a much cleaner weather barrier," Moore says.

Barley and Pfeiffer often specify a metal roof for their Austin homes to reflect solar heat back into the sky and away from the house.

"Fabral was a new company for us for the metal roof, and it's installed with a radiant barrier from Henry underneath," Effland says. "The metal roof functions almost like a shade umbrella above the house."

Fabral's thin metal roof, which is lightweight and reflective, warms up but won't store heat. The prefinished roof has coatings to prevent moss, mildew and fungus, and is low maintenance. The roof panels are Class A rated for fire resistance and Class 4 for hail, the highest possible rating for impact resistance, both of which add to the climate resilience of VISION House Austin.



On solid footing. Flooring from AHF is engineered hardwood designed to remain pristine no matter how much foot traffic there is.



Clear view. Fibrex-based Andersen windows were chosen for their durability and longevity. Meanwhile, Builders FirstSource supplied the unique framing those windows are mounted in.



Everlasting appeal. A synthetic deck from TimberTech provides strong fire protection. It's also made from 60 percent post-industrial and post-construction scrap materials.



Solid state. Tile floors and countertops from Crossville offer a stately appearance throughout the home.



Wide open spaces. VISION House Austin features an open floorplan that is conducive to aging in place.



Upon reflection. Fabral's metal roof is lightweight and reflective. Combined with a radiant barrier from Henry that is installed underneath the roof, the house becomes a "shade umbrella."

Andersen 100 Series windows and doors were chosen for the Georges' home for their durability and longevity. "We particularly like the fiberglass framing system, which performs well," Effland says. "Plus, thermally, they can hold up to the Texas heat."

The windows are made with Fibrex material, which is stronger than vinyl and includes a finish that can handle extreme heat without flaking or blistering.

"The fiberglass holds up really well and doesn't rot like some wood products," Effland says. "You don't have the thermal bridging issues that you have with some of the aluminum systems, either."

A highly efficient heating and cooling system from Trane will stand up to the extreme temperatures in Austin, which easily rise above a humid 100 degrees Fahrenheit in the summer and include ice storms in the winter.

"Trane also sponsored the mini-split system for the garage room, plus a triple filtration unit for the main HVAC system that will help with dust, pollens and particulates in the air," Effland says.

The Georges will rely on a Savant smart home system that's connected to its solar power and battery backup.

"Savant's system is also tied to the GE Profile appliances, so it will really help it monitor what devices are using energy in the house," Effland says. "If the power goes offline, it will help them manage the energy they're pulling from their batteries and understand where it's going. They can automatically shut off certain parts of the house in a power outage so that their battery storage will last longer."

An advantage of Savant is that the system has a module that works with standard panels and breakers, Moore says. "Most other power management systems have proprietary panels, and you have to use that system," Moore says. "This Savant system will be much easier to adjust in the future, since it works with standard equipment."

The Savant system allows the Georges to remotely monitor and control their GE Profile appliances, too.



Intelligent actions. A Savant smart home system, connected to solar power and a battery backup, monitors which devices are using energy in the house, and can also shut off certain parts of the house in an outage to ensure that battery power lasts longer.



Breathe easier. Indoor air quality is enhanced with a ventilation system from Field Controls.



Tough product. Trane's cooling and heating system withstands the extreme temperatures in Austin, which easily rise above a humid 100 degrees Fahrenheit in the summer and include ice storms in the winter.

HEALTH, WELLNESS AND COMFORT

While the design of the home meets the Georges' desire for energy efficiency, they are also pleased with the open floor plan and outdoor living areas that provide the space they want for their lifestyle.

The Georges look forward to relaxing on their screened porch and on their deck, which is a synthetic deck from TimberTech made from 60 percent post-industrial and post-construction scrap materials. The deck has the color and texture of wood, but it's a wood alternative with a Class A rating for flame spread.

"We've used synthetic decking before, but a lot of companies offer a fire-resistant deck with a wood frame, which is a big concern," Effland says. "We really like that TimberTech's deck comes with an aluminum frame that's also fire-resistant."

Inside, the floors and countertops are provided by AHF, including tile floors in the bathrooms and laundry room as well as engineered wood floors for the main living areas.

"The light-colored wood floors look really good," Effland says. "They're softer under your feet, compared to tile or concrete, so they don't hurt your feet and knees as much, which is great for aging in place."

A benefit of engineered wood floors, Moore says, is that they have the finish of high-quality hardwood but are more resource efficient because they use a lower grade subfloor. Typically, they can be installed with a plywood subfloor, which is less prone to warping over time and is more moisture resistant.

"Another benefit of the prefinished engineered floors is that the finish is factory applied, where the environment is carefully controlled," Moore

says. “You get a stronger, more-durable finish that way. And you’re not introducing all of the sanding and harsh chemicals in the house, which happens with wood floors that are finished in place.”

In addition to choices such as paint, flooring and cabinets that introduce fewer chemicals in the house, indoor air quality will be enhanced with a ventilation system from Field Controls.

“It’s hard to say enough good things about this system, because it’s just a really intelligent use of really simple mechanics,” Effland says. The new ASHRAE 62.2 energy code, he notes, is the standard formula for how much fresh air must be brought into a home based on its size and number of occupants.

“Most people are solving that by just installing an ERV that runs a fan at a low speed all of the time, bringing fresh air in and taking cold air out,” Effland says. “But when you pair that with the dryer exhaust, range hood vent and the bathroom exhaust, you end up ventilating your house more than you technically need to.”

Also, that ventilation brings in additional humidity that an air conditioner or dehumidifier has to handle, Effland adds. “It brings in additional pollutants from the outside that your filtration system has to handle,” he says.

The Field Controls system uses the HVAC fan to bring in fresh air instead of introducing a separate fan. “It also monitors up to four other devices, such as your dryer vent, your bathroom exhaust and your vent hood, and it will credit that run time towards your required ventilation,” Effland says. “That way, you don’t have to run your other fresh air supply ventilation system as much as you would otherwise, which saves energy and lowers your utility bill.”

The synergy between the design and the products and systems in the house helps the Georges achieve their goal of owning a simpler, efficient, low-maintenance, high-performance home.

“We designed this house before we partnered with Green Builder to turn this into a VISION House,” Effland says. “All of these sponsorships are only going to make it perform better and better for the Georges.” **GB**

Interior Design Choices Support Sustainability



Homeowners Robert and Judi George had the advantage of living right next door to their new home while it was under construction, enabling them to have instant input on design choices if needed. The Georges worked closely with interior designer Jacquelyn Bilek, owner of [Jacquelyn Bilek Interiors](#) in Austin, along with the architectural team at Barley|Pfeiffer Architecture in Austin and Justin Moore, owner of [White Elephant General Contractors](#) in Austin.

“Every house requires a dance between interior design and architecture,” Bilek says. “For the Georges’ house, we made design choices that would support the green features and aging in place.”

Some of the key decisions include opting for light, reflective horizontal surfaces such as the kitchen counters and floors to make it easier for residents to see and to accentuate natural light to reduce reliance on electricity for artificial lighting.

“Climate influences design choices everywhere,” Bilek says. “When I worked in Wyoming, the goal was to keep the heat in and the cold air out, so we tend to use dark colors and black metal there, which we wouldn’t do in Austin’s heat.”

The architects designed the Georges’ house with overhangs to reduce solar heat gain, but Bilek and the Georges also plan to install honeycomb shades inside for extra shade in the summer.

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In a changing climate, many products around your home have an impact. At James Hardie, we have a deep commitment to sustainability and know that it's possible for all homes to be future ready. Engineered for Climate®, Hardie® products are durable, resilient, and low maintenance by design.



The Queen of Zero is a rebuilt historic home in the Washington, DC area featuring Hardie® products to deliver a historic Victorian design with a modern standard of resiliency and durability.



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At the Panorama House in the mountains of Breckenridge, Hardie® siding is part of a project that is built for durability and resilience, while also providing a low maintenance solution.



James Hardie joined award-winning builder, Tim O'Brien Homes, on a new construction, next generation home called VISION House Sussex to create an attainable green home for American families in the upper Midwest, featuring Hardie® siding.

Building resilient homes for the future

Our products were selected by leading home builders from across the U.S. to highlight more resilient and durable construction. Each project is unique, but what they have in common is the incorporation of more durable and resilient solutions delivered through Hardie® products.



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ELEVATING BUILDING PERFORMANCE WITH FABRAL'S METAL SOLUTIONS



CHALLENGE

Building high-performance, healthy, and resilient homes means making smart, long-term choices — especially when it comes to the building envelope. Yet builders and homeowners often default to cheaper materials that sacrifice durability and efficiency. When high-performance products are sidelined during value engineering, long-term quality suffers.

SOLUTION

Fabral is redefining what's possible in roofing and wall systems. Designed for performance from the ground up, Fabral's Metal Wall and Roof Systems — including the innovative Thin Seam™ standing seam panel — offer superior weather resistance, energy efficiency, and architectural appeal. Manufactured from recyclable materials, these systems are engineered to support ventilation, reduce heat gain, and withstand increasingly extreme weather events.

At the VISION House, Fabral's 24 GA Thin Seam panel delivers a modern aesthetic with unmatched protection. Its 24-gauge steel construction and concealed fasteners enhance strength, water resistance, and clean lines. The reflective finish lowers cooling loads and extends roof life — all while contributing to better indoor air quality and occupant comfort.

IMPACT

For builders, Fabral's lightweight, high-strength panels offer practical advantages that translate directly to the bottom line. Easy to transport and install, they help streamline construction timelines and reduce labor costs—critical benefits for performance-driven projects operating on tight schedules.

For homeowners, Fabral's metal systems deliver enduring, long-term value. With minimal maintenance requirements, superior energy efficiency, and a sleek, modern look, they offer an elegant blend of form and function that lasts for decades.

Fabral proves that choosing sustainable materials doesn't require compromise. In fact, it's an upgrade—offering better performance, greater durability, and a future-ready aesthetic that reflects the next generation of building.

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TODAY'S HOMEOWNER



EMERGENCE OF GEN ALPHA: THE FUTURE OF HOUSING

In just a few years, the world's largest generation will turn its thoughts to homebuying. Here's what Green Builder Media has found out so far.

BY SARA GUTTERMAN

The housing market is undergoing a profound transformation—not just in terms of materials, technologies and energy systems, but also in the mindset of its customers.

As younger individuals reshape traditional perspectives about housing, building professionals and manufacturers are rethinking their strategies and messaging to meet the evolving expectations of today's home buyers.

Green Builder Media's latest generational marketing study offers deep insights into the housing-related values and behaviors of Baby Boomers, Gen Xers, Millennials, Gen Zs—and now, for the first time, Generation Alpha.

GENERATIONAL SNAPSHOTS: A QUICK REFRESHER

Baby Boomers (born 1946-1964) continue to hold significant levels of wealth and homeownership. They're largely choosing to age in place, and they're remodeling their homes with accessibility

and energy efficiency in mind. They value comfort, stability and return on investment (ROI)-based upgrades, and many view their homes as a core part of their identity.



Gen Xers (born 1965-1980), shaped by economic volatility such as the 2008 recession, are conservative buyers focused on ROI, practical upgrades and multigenerational flexibility. They are the “sandwich generation,” supporting children and aging parents. They’re looking for homes that enable them to entertain and accommodate multiple generations.



Millennials (born 1981-1996) have propelled the sustainability revolution in housing. Mission-driven and value-focused, these individuals are pushing the market toward compact, efficient, tech-enabled and net-zero-ready homes. As they have penetrated the homebuying market, they have shifted the valuation metric: They take into consideration total cost of ownership (as opposed to just focusing on price per square foot) and they realize that first cost doesn’t equal full cost.



Gen Zs (born 1997-2010) are digital natives entering the housing market with a strong desire for sustainability, equality and smart technology. Though financially constrained, they bring creativity and new purchasing models to homeownership.



ALL EYES ON GEN ALPHA

Now comes **Generation Alpha—the cohort born after 2010**. With 2.5 million new Alphas born globally every week, they are expected to become the largest generation in history. In the U.S., there are already more than 50 million Gen Alphas. By 2030, the oldest Alphas will begin entering the housing market.





Why does this matter now? Because Gen Alpha is poised to accelerate a fundamental shift in how we design, build and market homes.

THE AI GENERATION

Gen Alpha is growing up surrounded by AI, virtual reality and digital-first experiences. While smart home technology was a novelty for Boomers and Xers and became essential for Millennials and Zs, Alphas will expect AI-integrated systems that seamlessly manage energy, security, climate and even health. Voice and gesture control, biometric access, predictive maintenance and digital twin modeling will likely be standard expectations.

For this generation, homes won't just be shelters—they will be responsive systems. Alphas will expect their living spaces to learn, adapt and evolve, using data to maximize comfort, sustainability, and efficiency.

FROM SUSTAINABILITY TO REGENERATION

Millennials and Gen Zs helped usher in net-zero and all-electric homes. Gen Alpha will push for regenerative housing. They will demand homes that not only minimize carbon emissions but also sequester carbon, enhance biodiversity and contribute positively to environmental systems.

Expectations will include:

- Passive and biophilic design
- Carbon-negative materials
- Adaptive smart systems that learn an owner's behavior and optimize performance
- Predictive analysis and proactive diagnostics
- On-site food production
- Water harvesting and reuse systems
- Hyper-local energy generation and storage

For example, new residential developments such as Whisper Valley in Austin, Texas, are already exploring this regenerative

Alpha enjoyment. New residential developments such as Whisper Valley in Austin, Texas, are enticing younger generations with their clean energy systems, organic gardens, healthy home certifications and entry-level prices. CREDIT: COURTESY OF THURMAN HOMES



future with geothermal energy loops, solar photovoltaic (PV) systems, organic gardens and healthy home certifications. This model may become the baseline for Gen Alpha.

FLEXIBLE, TRANSFORMABLE, GAMIFIED SPACES

While Millennials want flexible rooms and Gen Zs want multifunctional design, Alphas will expect transformable environments. A room might serve as a yoga studio in the morning, a classroom during the day, and a gaming hub by night.

Gamification will shape everything from chores to sustainability behavior, nudging positive choices through real-time feedback and rewards. This isn't just about fun—it's how Gen Alphas will engage with the world around them.



MILLENNIALS & GEN Z VS. ALPHA

FEATURE	MILLENNIALS & GEN Z	GEN ALPHA (PROJECTED)
Tech Integration	Smart home tech (manual controls)	AI-powered automation & predictive tech
Sustainability	Net-zero homes (low carbon)	Regenerative homes (carbon-negative)
Space Utilization	Flexible spaces & home offices	Modular, shape-shifting interiors
Housing Type	Eco-friendly & prefab homes	Nature-integrated, biophilic designs
Mobility & Transport	EV charging at home	Autonomous transport, car-free zones

Evolving expectations. COGNITION Smart Data highlights the shift in expectations between Millennials and Gen Zs versus Gen Alphas.

THE PATH FORWARD FOR MARKETERS AND BUILDERS

Savvy marketers are already starting to plan for Gen Alpha, incorporating the Alpha worldview—one that has been shaped by climate awareness, digital fluency and social justice—into product design, corporate sustainability strategies and communications.

And it's not a moment too soon. According to COGNITION Smart Data, more than 90 percent of Gen Alpha parents report that their children influence household product choices, particularly around technology and sustainability. Eighty-three percent of Gen Alphas expect homes to come with built-in solar, energy storage and electric vehicle (EV) charging by default.

Trending innovations that will likely be baseline expectations for Gen Alphas include:

- **Smart panels:** Companies such as SPAN and Schneider Electric are redefining the electrical panel as a digital command center for energy use, a feature Gen Alpha will see as essential.
- **AR/VR design tools:** Homebuyers are already widely using platforms like Zillow, Redfin and Trulia, which allow them to visualize homes in immersive formats, including 3D tours, interactive floor plans and detailed neighborhood information. Alphas will expect even more advanced and interactive versions of these platforms, with augmented reality and virtual reality features to enable them to visualize how they will live in a home prior to purchase.
- **Flexible infrastructure:** Companies such as Ori Living are

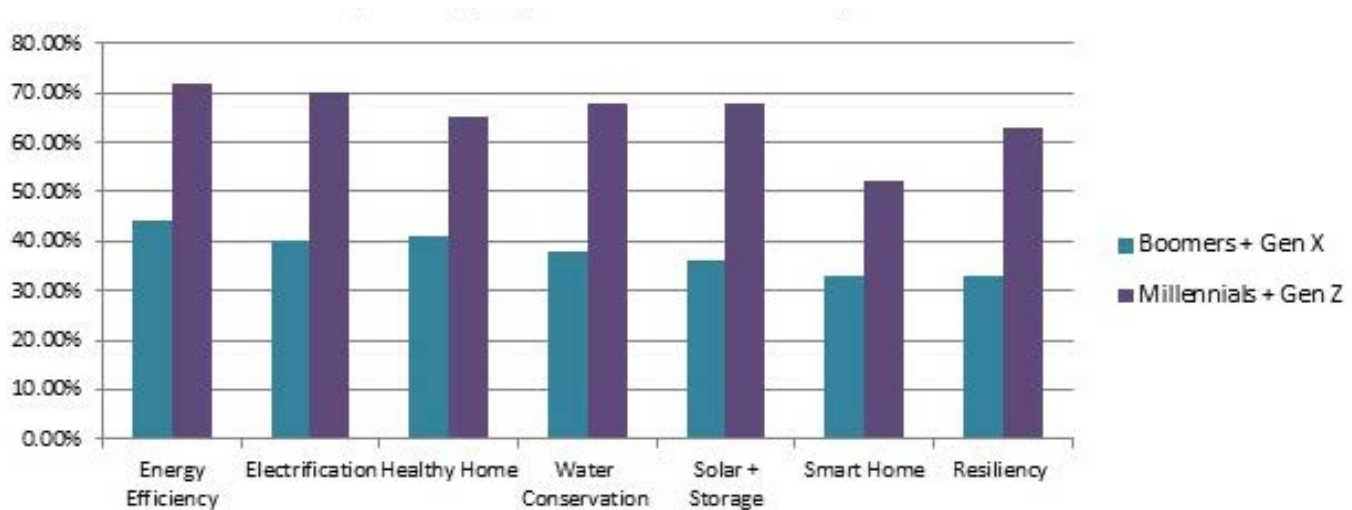
pioneering robotic, modular furniture that converts spaces with a touch of a button, enabling effortless space transformation—a preview of what Alphas will demand.

- **Health-first materials:** With indoor air quality being a top concern, manufacturers who can verify zero-VOC, antimicrobial and non-toxic certifications will align with Alpha's high expectations for wellness.

No doubt, we are on the cusp of a generational evolution that will redefine what it means to own, live in, and relate to a home. Gen Alpha will reshape the housing markets. It won't be satisfied with retrofitted solutions—it will expect innovation by design. Expectations are bold: smarter systems, healthier spaces, deeper sustainability, and design that enables freedom, flexibility and future readiness.

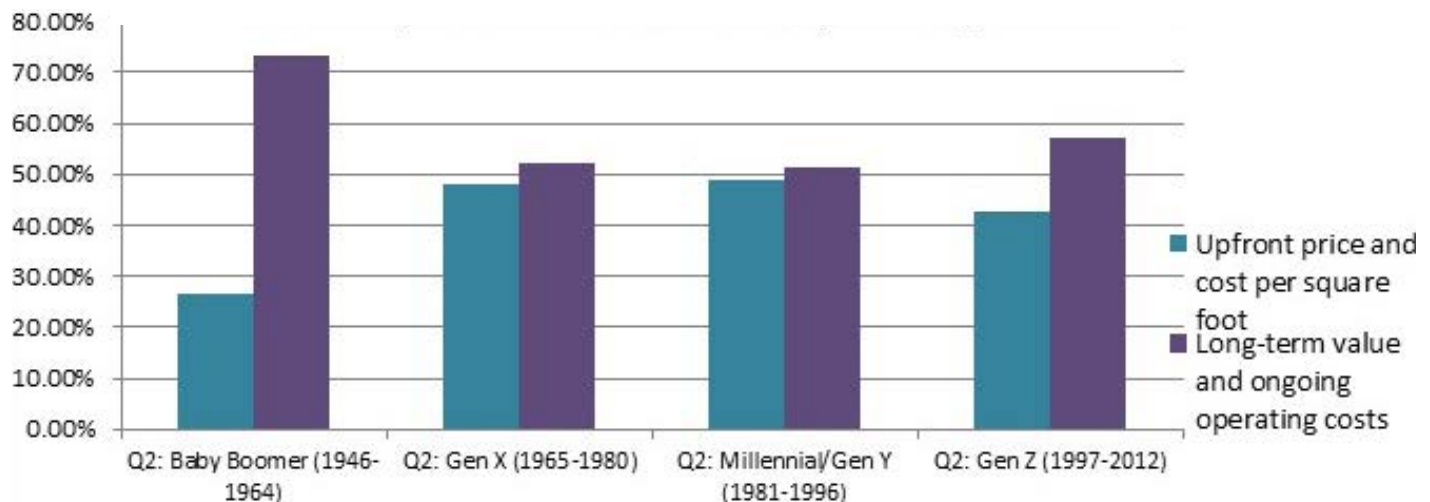


Are you willing to pay more upfront for sustainability upgrades if they will lower your ongoing cost of homeownership overtime?



Future thinkers. Millennials and Gen Zs are more willing than Boomers and Xers to invest in sustainability upgrades that will lower their ongoing cost of ownership over time.

Which are you more focused on when purchasing a home?



Joint understanding. A recent COGNITION Smart Data survey shows that Boomers, Xers, Millennials and Gen Zs are all more more focused on long-term value and operating costs as opposed to upfront price and cost per square foot when purchasing a home. This marks a fundamental shift in understanding the full cost of owning a home versus first cost.

To learn more about how each generation views homeownership, and how to tailor your outreach and offerings accordingly, visit [Green Builder Media](https://www.greenbuildermedia.com) and explore our latest generational insights. **GB**

Carrier's 1st Environmental Product Declaration for Residential HVAC Systems is Available Online



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TWO DECADES OF PROGRESS:

How HVAC Innovation Is Shaping the Future of Sustainable Living

Over the last 20 years, the building industry has quietly undergone a revolution. Driven by tightening codes, shifting consumer expectations, and sustainability ambitions, building professionals have moved from basic efficiency to full-scale system innovation.

As high-performance housing becomes the new baseline, companies like Carrier have pushed the envelope—engineering systems that are not only more efficient, but also smarter, cleaner, and more responsive to climate extremes.

Take, for example, Carrier's recent response to the U.S. Department of Energy's Cold Climate Heat Pump Challenge. The company's **Infinity® variable-speed heat pump with Greenspeed® Intelligence** provided a milestone in electrified heating. Tested in homes in upstate New York, the system ran at full capacity at 0°F, maintained reliability at -13°F, and was lab-tested down to -23°F—delivering all-electric comfort in regions once thought too cold for heat pumps.

It's a compelling case study in what's possible when long-standing building systems are reimagined for performance, resilience, and efficiency.

Beyond product development, **Carrier has pledged over \$4 billion by 2030** to accelerate intelligent climate and energy solutions. The company has also helped customers avoid more than one gigaton of greenhouse gas emissions—a reminder that decarbonizing the built environment starts with the systems that make homes livable.

The last two decades have seen HVAC evolve from a utility to an essential driver of sustainability, with a growing role in electrification, grid optimization, and climate adaptation and resiliency. As the building industry looks toward a net-zero future, high-performance HVAC systems like these will be critical to balancing comfort, efficiency, and greenhouse gas emissions—especially in an era of increasingly extreme weather.

Because innovation in this sector isn't just about technology, it's also about delivering solutions that meet the moment.



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**COMING NEXT ISSUE****2025 Eco-Leaders**

This year's annual special edition features builders and developers who are breaking new ground with communities designed around sustainable principles and innovations.

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Alchemy: A historical practice that blended chemistry with philosophy and spiritual beliefs, aiming to transform base metals into precious ones, find a universal cure for disease, and discover the secret of immortality.

In the ongoing saga known as the settlement of the American West, the alchemist is one who has mastered the illusion of forcing water to flow uphill, towards money. The practice is one that requires equal parts greed, short-sightedness, and collusion. Therein lies a cautionary tale.

As famously depicted in the movie classic, “Chinatown,” the winning strategy says if you can’t bring the people to the water, bring the water to the people. It involves separating the water resource from where it is naturally found, and then moving it, by any number of questionable legal vehicles and drastic physical means, to a different location. The intended result being that land deemed less desirable is suddenly transformed into a much more valuable asset.

Recent reports indicate a renewed interest in freeing up land that is held by the federal government (which can be translated to mean the citizens of the United States) so that it can be developed for housing, which is in extremely short supply. This would not be unprecedented, and there are examples of such endeavors that have been successful. It can be argued that the most beneficial use for certain tracts of public land might be to make them available for that very purpose.

Proponents point out that the most appropriate holdings are found in locations managed by the Bureau of Land Management (BLM). The U.S. government owns and manages about 640 million acres of land, or about 28 percent of the total land area of the United States, mostly concentrated in the Western states. It’s fair to say that a shortage of dirt is not the problem.

The land owned and managed by the BLM has emerged as a top contender for housing and development because it is not comprised of national park or forest land, nor Native American land. Rather, it is “primarily vast, undeveloped tracts located near or adjacent to high-growth cities.” Las Vegas and Phoenix are frequently mentioned as prime examples.

This, however, is where the bad decisions of the past come home to roost. The locations that have the development and building sector drooling are already some of the most water starved in the country. As early as the 1500s, a scribe of the Spanish explorer Coronado wrote in a report to the King of Spain that the lands along the mid Rio Grande valley, although they had a perennial water flow, were “not suitable for permanent habitation.”

The journals of the Lewis and Clark expedition echo the same kinds of concerns. In 1878, John Wesley Powell sent Congress his “Report on the Lands of the Arid Regions of the USA” in which he estimated that only 2 percent of the land west of the 100th meridian was suitable for agriculture. But the federal government, land speculators and the railroads all pushed for economic growth. Warnings about water scarcity in their “promised land” were summarily rejected in favor of more optimistic opinions.

We know the rest of the story. Inflated estimates of the flow rates for the Colorado River Basin, to the tune of 16.4 million-acre-feet-per-year, based largely on wishful thinking, errors in past flow amounts, inaccurate water evaporation assumptions and grossly exaggerated future precipitation considerations. The more-scientific calculations based on flow rates measured at Lee’s Ferry—which set the rate at 15 million-acre-feet per year—overestimated the rates by a million and a half units.

Fast forward to the present and the population of the basin depending on Colorado River water has grown from 20 million in 1980 to more than 40 million today, coupled with the fact that the current two-decade (and ongoing) drought has resulted in flow rates that have averaged 12.4m acre feet, while the total water allocation for the river system has ballooned to 19.3m acre feet.

Is it not easy to understand why the water levels at Lake Mead and Lake Powell are nearing critical lows? The current federal administration appears to be too concerned with re-installing high-flow shower heads for personal satisfaction. They should be concerned with ensuring that future residential developments have not only the acreage needed to support new homes, but that those houses, neighborhoods and communities will have a sustainable supply of water.

We all want to believe in magic, but let’s not fall for the same old tricks. **GB**



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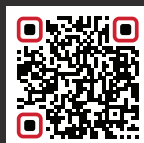


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