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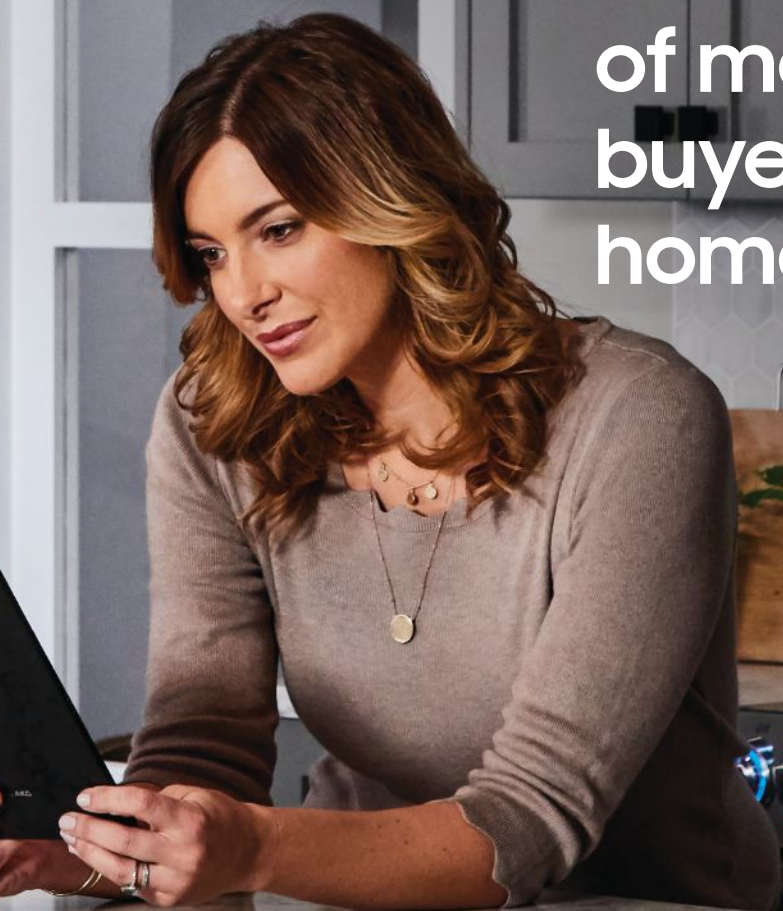
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Image courtesy of The Bluestone Organization, Beach Green Dunes

RESIDENTIAL CONSTRUCTION'S SILVER BULLET?

Helping solve labor issues is just the beginning of this surprising building solution.

To view one way out of the labor shortages afflicting residential construction, take a drive about an hour south of Washington D.C.

Welcome to Mechanicsville, Md. One of the homes in this community of 1,500 demonstrates a surprisingly robust solution to environmental, life safety (think hurricanes, tornadoes, and wildfires), comfort, and constructability issues many builders face.

The home is built with **insulated concrete forms** (ICFs), a material so high-performing and easy to use some may wonder, "Is it too good to be true?"

Tony Aina understands. As owner of that ICF home in Mechanicsville and Green Building Guru at building supply company BuilderUp, he loves to set the record straight about ICFs.

What is an ICF? They're hollow, lightweight paneled blocks of sandwiched plastic foam. The hollow center is filled at the worksite with reinforced concrete, creating a remarkably resilient and energy-efficient wall. ICF is a mature building process fully code-compliant with the ICC and CCMC.

"ICFs answer lots of questions. Let's start with labor. Many builders and contractors are short-handed. ICFs helps solve the labor issue with light, easy to assemble panels that require only a small crew," Aina explains. Labor costs and associated expenses like workers comp insurance are dramatically reduced.

If Aina stopped there, that might be enough for many residential builders and developers. He's just getting started:

1. Assembly Speed. "There's a five-story Microtel building going up nearby. They're using ICF. They'll cut two months off the construction schedule. You know what that means for ROI," Aina says.



Courtesy of Tony Aina

- 2. 6-In-1 Wall Assembly.** ICFs serve as the building structure, furring, insulation, sound-proofing, and vapor barrier in one pass.
- 3. Energy Savings.** ICFs deliver up to R-24 performance without the thermal bridges common to stick-built wall assemblies. "That's the beauty of ICF. Once the blocks are stacked, the building is self-insulated," Aina reports.
- 4. Wind & Fire Protection.** It's become a post-disaster cliché that the only building standing after a wildfire, tornado, or hurricane are ICF buildings. ICF walls are fire-rated up to four hours. An ICF structure can withstand winds up to 250 mph—strong enough to resist an EF5 tornado or Cat 5 hurricane.
- 5. Comfort.** ICF walls achieve an STC of 50 or higher, about a 70 percent noise

reduction from a traditional home. The thermal mass property of concrete helps ensure temperature extremes – hot or cold—have minimal impact on interior comfort. ICFs do not emit VOCs or any harmful off-gas.

- 6. Owner Affordability.** Aina says, "In multifamily or mixed-use applications, the owner can expect payback in as little as a year. With residential, the numbers are even more compelling," Aina reports, noting that energy bills are typically cut by 50 percent or more.

Are ICFs the industry's silver bullet? Aina won't argue against it. "They work within the labor force we have and deliver a much better product that people can afford. It's a win-win for everyone."

To learn more about ICFs for residential and commercial construction, visit BuildWithStrength.com.



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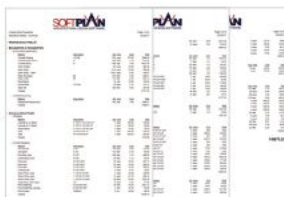
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FUTURE-PROOF IS A VERB. IT'S AN ACTION TERM. TO TAKE action to make your firm, our communities, this business, and our world fit for tomorrow, here's a unique and compelling opportunity: Hive 2019.

Wikipedia—a place where wisdom-of-crowds definitions, meanings, and what matters to people intersect—says this about future-proofing: [It's] “the process of anticipating the future and developing methods of minimizing the effects of shocks and stresses of future events. Future-proofing is used in industries such as electronics, medical industry, industrial design, and, more recently, in design for climate change. The principles of future-proofing are extracted from other industries and codified as a system for approaching an intervention in a historic building.”

We've been obsessing here about “shocks and stresses of future events.” Once upon a time, up until about 15 years or so ago, four of them might have been thought about roughly like this:

Homesites will cost too much, laden with excessive regulatory burdens that add 30% to 40% to asking prices.

Skilled construction workers, disappearing more by the day, will be too scarce; together with productivity losses due to inefficient, technologically outdated processes, this will add another 20% to 25% to asking prices.

Loans to both home building firms and to potential mortgage borrowers, while low in cost, will be too hard to qualify for, given new baseline requirements and scorecards for access to the credit box.

Buildings will generate upward of 40% of annual global greenhouse gas emissions.

As our reference notes, “future-proof refers to the ability of something to continue to be of value into the distant future—that the item does not become obsolete.”

Now, if you embrace a theory that we're apt to overestimate extents of change in the near term, and underestimate the magnitude of change in the more distant future, you may be nodding your head right now. These four shocks and stresses were once the future, and now they're big-time sources of friction in the path of those who want to experience the future.

Today's set of shocks and stresses of future events—amplified, accelerated, and augmented by technology and data—pose existential risks:

- Loss of relevance
- Obsolescence
- Loss of trust
- Insolvency
- Disruption
- Extinction

Challenges of a future that now matters more than all of the stored knowledge and sage experience of the past create shocks and stresses to our tools, to our devices, to our careers, to our homes, to our business models, to our industries, to our neighborhoods, and to our ecosystem of communities that relate and interdepend.

This is why we've focused Hive 2019—happening Dec. 4 and 5 in Austin—on conversation and engagement that will empower participants to act, to future-proof, and to become more resilient, more capable of continuing to be of value, and more fit to flourish despite shocks and stresses of future events. If it's not yet on your calendar, visit hwhive.com for an event summary and to register. **B**

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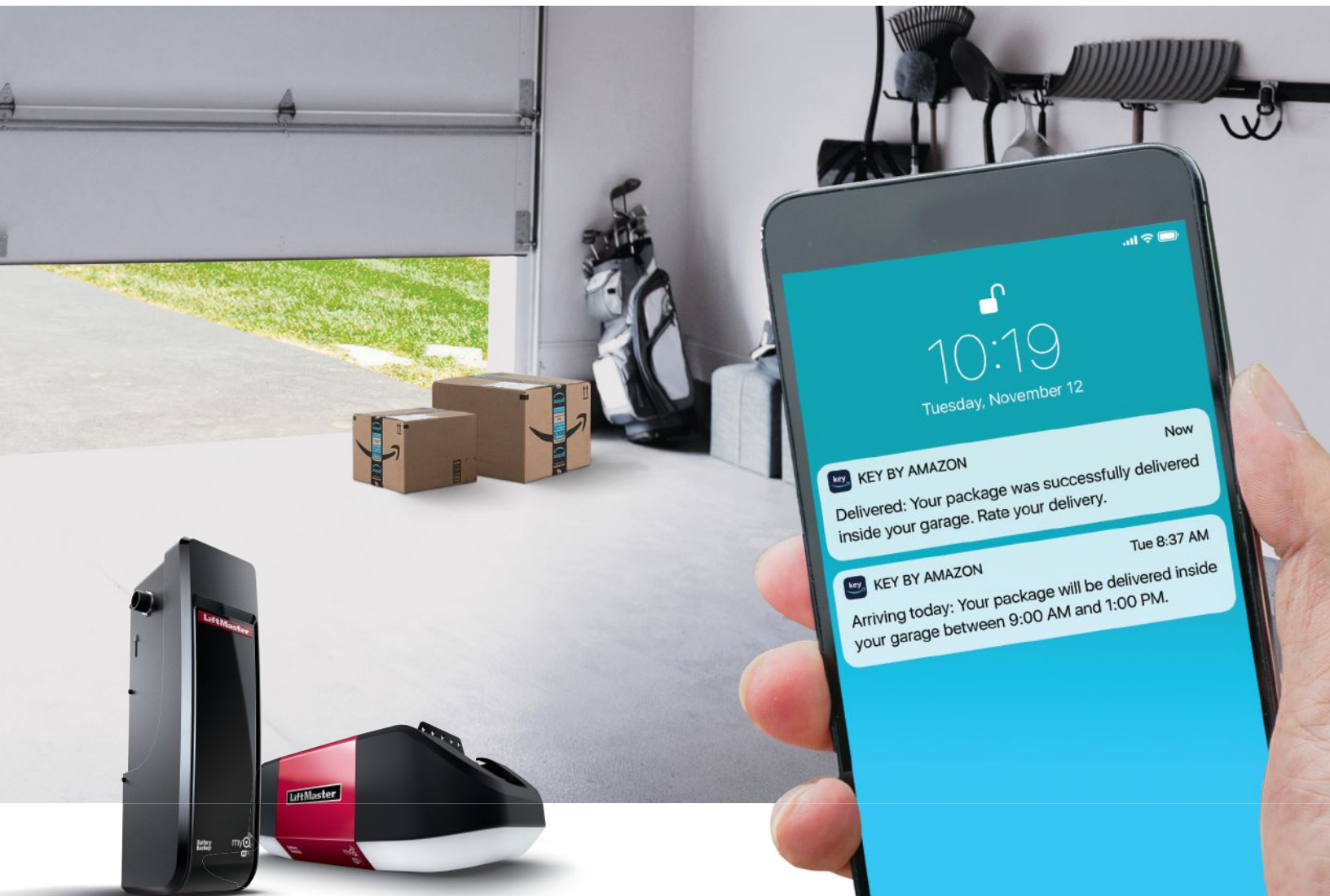
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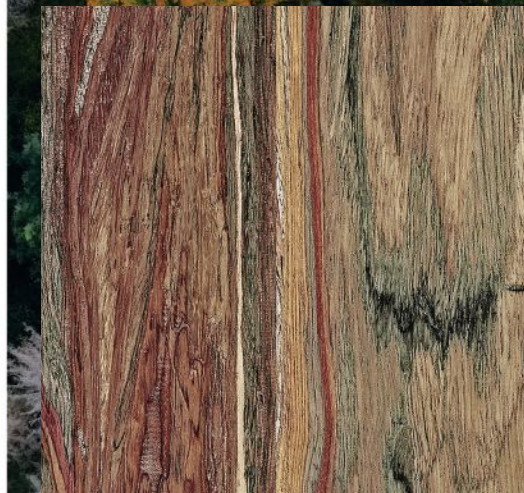
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As Puerto Rico Rebuilds, Housing Demand Is High

IN SEPTEMBER 2017, MCCORMACK BARON SALAZAR was about to celebrate a ribbon cutting. The St. Louis-based affordable housing developer had almost finished its redevelopment of two public housing projects in San Juan, Puerto Rico, into new neighborhoods with apartments affordable to residents earning a mix of incomes.

Then Hurricane Maria, a Category 4 storm, struck Sept. 20, destroying tens of thousands of homes and cutting electrical power for months—eventually causing almost 3,000 deaths.

Since then, affordable housing developers have been focused on rebuilding. MBS and its partner, the Puerto Rico Department of Housing, repaired the two damaged communities, welcomed residents, and started construction on a third project. National developers Michaels Development Co. and Volunteers of America plan to buy older properties and renovate them to be even more resilient against the next storm.

Double Strike on Puerto Rico

On Sept. 6, 2017, Hurricane Irma passed just north of the island. As a Category 5 storm, it did not need to strike Puerto Rico directly to cause \$3 billion in damage and several deaths. A few weeks later, Hurricane Maria made landfall.

The hurricanes destroyed tens of thousands of wood-frame, single-family homes across the island. However, Puerto Rico's affordable housing properties were more resilient. "None of us had serious damage," says Patrick Sheridan, VOA executive vice president of housing.

Hurricane Maria caused more damage at the public housing sites being redeveloped by MBS and DOH, even though the buildings had been designed to withstand the impact of a Category 4 storm. "Because of rain penetration, we had to go through mold and environmental remediation," says Vince Bennett, MBS president.

Labor has also proved to be a challenge, even more so than in the mainland U.S. "I think it's going to be very difficult to get workforce



Damage from Hurricane Maria in 2017.

down there," says Milton Pratt, senior vice president co-lead for Michaels Development Affordable. "It's not like New Orleans, where people could drive in."

The money to rebuild has been slow to arrive. Federal Community Development Block Grant Disaster Recovery funds have been delayed. Flood insurance companies also have taken longer than expected to pay claims. "The money that the territory expected to be released has not gotten out there as quickly as they'd like, but they continue to make excellent strides in managing such a large influx of funding," says Pratt.

At MBS' public housing redevelopments, federal officials provided an extension of the deadline to place the units in service under the low-income housing tax credit program. But MBS also had to honor commitments it had made to its LIHTC investor, Hunt Capital. "We were writing checks to meet completion obligations and lease-up obligations," says Bennett.

In February, MBS and DOH opened 140 apartments at Renaissance Square, a mixed-income community near the old San Juan Historic District. A few months later, they opened 174 apartments at Bayshore Villas. At both properties, most of the units are reserved for low-income households alongside some apartments renting at higher, unrestricted rents.

"The demand for these apartments has been tremendous," says Bennett, noting that several thousand people signed up on waiting lists to move in. Even though the number of people living on the island has been shrinking for years, clearly demand for affordable housing on the island is high. The population of Puerto Rico was just 3.2 million in 2018, down 3.2% from the year before, according to Pew Research Center. However, the shortage of undamaged housing is still intense on the island.

That's especially true for elderly Puerto Ricans whose homes were damaged in the hurricanes. Many have also lost support because younger relatives have left the island. "Now they are faced with not having family there to take care of them," says Sheridan. "Senior housing is what is needed." —BENDIX ANDERSON

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WADE PAQUIN

U.S. Construction Employment Shows Growth



CONSTRUCTION EMPLOYMENT GREW IN 70% of the 258 metro areas analyzed by the Associated General Contractors of America from August 2018 to August 2019. Despite tight labor conditions and a majority of contractors reporting having difficulty finding enough workers to hire, the data suggests many firms are finding ways to add staff. A recent news release from the AGC indicates 252 metro areas saw construction employment increase on a year-over-year basis.

"Construction firms would likely be adding even more jobs if they could find more qualified workers to hire," said Ken Simonson, AGC's chief economist, in a public statement. "But tight labor market conditions are prompting many firms to become more efficient and more adaptable to keep pace with demand for their services."

The growth in construction employment YOY is consistent with recent monthly reports from the AGC. In July, 258 metros added construction jobs YOY, while 253 and 249 added industry jobs in June and May, respectively.

To make positions more appealing, many firms are boosting pay and benefits, investing in training programs, and adopting new technologies and techniques to become more efficient, according to the AGC. Even with these efforts, firms are often proposing longer construction schedules and charging higher prices as a result of the skilled labor shortage.

Dallas-Plano-Irving, Texas; Phoenix-Mesa-Scottsdale, Ariz.; Los Angeles-Long Beach-Glendale, Calif.; and St. Louis, Mo., added the most construction jobs in pure numbers during the past 12 months, while Auburn-Opelika, Ala., and Spokane-Spokane Valley, Wash., reported the highest percentage gain in industry employment in the same time period. Charlotte-Concord-Gastonia, N.C., and Baton Rouge, La., experienced the largest number of jobs lost between August 2018 and August 2019, while Fairbanks, Alaska, and Longview, Texas, experienced the steepest percentage decline in employment YOY.

—VINCENT SALANDRO



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More Storage for the Win

Make it easy on your buyers with a one-story layout and tons of closet space

by **AURORA ZELEDON**



IT'S SIMPLE: A ONE-STORY HOME WILL APPEAL TO A WIDER POOL of potential buyers than a two-story design. Besides being better for aging in place, a single-level floor plan simplifies everyday living for everyone, from young parents to older downsizers. You know what else carries universal appeal? Storage, and lots of it.

Here's a simple but stylish house plan that would work well for many different home buyers. The open layout makes it easy to keep an eye on children, guests, or pets while preparing meals at the kitchen's massive island. A fireplace warms the screen porch in back for year-round outdoor entertaining. And speaking of hosting, the walk-in pantry can hold enough groceries and supplies to always be prepared for an impromptu gathering.

Perhaps even more appealing is the master suite's spa-like bathroom and capacious walk-in closet. Large enough to hold a comprehensive wardrobe, this storage area also opens directly into the laundry room to make chores faster.

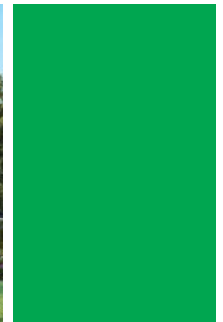
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The State of Sustainability

Research indicates the market share of green single-family construction continues to grow

by MICHAEL TOBIAS

THERE IS NO DOUBT THAT SUSTAINABILITY IS BECOMING THE standard for new homes. It's not just because of the global initiative to aim for zero-carbon-energy new buildings by 2030, but also because many of the design features intrinsic to the concept of "green" building carry direct benefits for consumers. These include lower utility bills, greater comfort, reduced maintenance, and ultimately increased value that results in higher selling prices.

Furthermore, research indicates that the market share of sustainable single-family residential construction is continuing to grow. This includes single-family detached houses and single-family dwellings that share one or more walls with another unit.

The NAHB's authoritative SmartMarket Brief, *Green Multifamily and Single-Family Homes 2017*, indicates that while the market share of green single-family homes was a mere 2% in 2005, it had climbed to 33% in 2017 and is set to reach 38% this year, continuing upward to 44% by 2022. The figures for single-family remodelers are similar, climbing from 20% in 2017 to an estimated 35% by 2022.

Affiliated with local and state home builders associations across the U.S., the NAHB conducts ongoing research relating to green building and sustainability. It reports that 80% of home buyers of all ages are positively influenced by energy-efficient strategies when deciding which property to buy. The most important factors mentioned are above-code insulation and Energy Star windows and appliances.

NAHB's most recent report is encouraging. Of the builder respondents committed to sustainability:

- 88% believed customers appreciated the prospect of getting a better quality product;
- 76% said it was simply due to customer demand; and
- 73% believed customers recognized the value of sustainable homes.

SUSTAINABILITY OF RESIDENTIAL BUILDINGS

But what makes a single-family home sustainable, and what do buyers want? Sustainable home buildings operate with reduced carbon emissions, minimize all forms of environmental impact, and promote renewable energy.

Launched in 2018, the National Green Building Standard was designed to rate and certify residential buildings, including single-family homes.

There are various other green certification systems, including the U.S. Green Building Council's LEED, the EPA's Energy Star, and RESNET's Home Energy Rating System, but the NGBS is the only green building rating system for homes that is approved by the American National Standards Institute.

Due for its third update in 2020, the NGBS has six green practice categories that align with important areas of sustainability.

- **Site design, preparation, and development**, which is where sustainability starts. The aim is to have low-impact development strategies and/or a green infrastructure designed to

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handle storm events. Transit features are important for townhouses and cluster housing.

- **Resource efficiency**, which involves using required percentages of recycled materials, including precut, precast, and preassembled products. Resource efficiency also embraces size, with smaller homes being potentially more sustainable than larger homes.
- **Energy efficiency** is key to the sustainability of all buildings, including houses and apartments. It relates to mechanical systems for heating, ventilation, and air conditioning designed for living spaces and heating of water, as well as cooking, refrigeration, and the other activities for which we need power, like washing and drying clothes and doing the dishes. For this reason, the use of Energy Star appliances and fittings is important. Energy efficiency also relates to lighting and incorporates everything from the type of lightbulbs used to building design that exploits the use of natural sunlight. Other factors that ensure energy efficiency relate to insulation, fenestration, U-factors, and solar heat gain coefficients for exterior doors, windows, and skylights.
- **Water efficiency** both inside the home and in the yard, which incorporates the use of low-flow showerheads, energy-efficient appliances, and irrigation control systems. The use of graywater and rainwater harvesting systems also adds to the sustainability of the dwelling. Water for fire protection systems and automatic sprinklers are other elements that should be carefully considered in terms of sustainability.
- **Indoor environmental quality**, which includes air quality (including return ducts in parking garages and air handling equipment), heating, and cooling. It also relates to the need to avoid building materials such as paints, adhesives, and sealants that contain volatile organic compounds.
- The **operation, maintenance, and education** of building owners.

The most recent version of the NAHB's *What Home Buyers Really Want* reveals that

energy-saving features and whole-house certification are important to home buyers. Based on a survey of about 4,000 home buyers, it also shows that people are downscaling in size and reducing the demand for upscale features like three-car garages.

Instead of focusing on curb appeal, most respondents (63%) wanted a home that utilizes passive solar design for both cooling and heating. A relatively large percentage (32%) said they were concerned about the environment but admitted it wouldn't affect their home purchase. A larger percentage (36%) wanted a sustainable, eco-friendly home but weren't prepared to pay a higher cost. Only 14% were prepared to pay more.

One of the greatest challenges of green building is the consumer perception that it involves higher upfront costs compared with conventional buildings, particularly in terms of building materials and fittings.

STRATEGIES FOR SUSTAINABLE SINGLE-FAMILY HOMES

The strategies required to make single-family homes sustainable are no different from those employed for other residential buildings, or even commercial or industrial buildings.

There is no doubt that energy efficiency ranks at the top in terms of expectations, and with good reason. More people are recognizing the need for a healthier indoor environment, in addition to the need for homes to be both resilient and durable. Single-family respondents to the NAHB SmartMarket report ranked the importance of these top three practices at 95%, 63%, and 50%, respectively. Other important strategies include the efficient use of natural resources, water efficiency, and a reduced carbon footprint.

The use of all types of renewable technology continues to grow, particularly solar photovoltaics and ground-source heat exchange, both of which are being used by about 25% of single-family home builders. As demand increases, costs are beginning to decrease, helping to drive the goal toward net-zero homes. Wind power, meanwhile, hasn't yet been embraced by single-family homeowners, primarily because of cost and logistics.

THE COST OF SUSTAINABLE BUILDING

One of the greatest challenges of green building is the consumer perception that it involves higher upfront costs compared with conventional buildings, particularly in terms of building materials and fittings. Other factors include additional time and costs required for research, training, documentation, and design by professionals.

The NAHB report identified an important shift in the market that shows 30% of single-family home builders and remodelers who identified themselves as "dedicated green builders" had lower incremental costs. Only 15% of those who had less commitment achieved lower costs. To me, this shows that an increase in experience will lead to lower costs.

Whether customers will pay a higher price for sustainable homes is a moot point, but 91% of dedicated green single-family builders believe they will pay more if the premium increase is no more than 5% to 10%.

There doesn't seem to be any single factor that drives demand for sustainable housing, but there is agreement among single-family builders and remodelers that when it comes to marketing, the terms "operating efficiency" and "long-term utility cost savings" are the most effective. Buyers also respond well to references to healthy, high-performance homes and quality construction. Perhaps ironically, the term "sustainable" is the least effective.

The challenge now is to encourage more single-family home builders to build net-zero-ready homes that meet the upcoming goals of zero-carbon emissions globally. **B**

Michael Tobias is the founder and principal of New York Engineers. He specializes in sustainable building technology and is a member of the USGBC.



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TRI Pointe Group's Design Studios use portals, video walls, and software to streamline the buying process for home buyers and the design team.

Like many builders, TRI Pointe Group, a family of premium home builders based in Irvine, California, offers seemingly countless options for home buyers to choose from via its Design Studios. Recognizing how the process can sometimes overwhelm home buyers, TRI Pointe implemented several technologies that make it easier to browse, compare, price, and make product selections.

One such technology is an **options portal**, where buyers can see what's included in their home as well as personal choice upgrades. Buyers access the portal from home and, similar to browsing for a car online, research what's included, see and save images and descriptions, and view side-by-side comparisons. The customer can create a personal wish list to be better prepared for their Design Studio visit.

Additionally, TRI Pointe uses **Interior Logic's proprietary technology** for flooring selections in several of its markets. Home buyers can see each area where flooring will be installed, view diagrams of how flooring will look in each room, and get real-time pricing.

For the design team, these features help buyers choose products with greater confidence—which means more peace of mind and increased satisfaction. In addition, the tool saves time by eliminating the need to send diagrams out for custom pricing.

"Interior Logic Group's proprietary technology is great for home buyers because it provides pricing on site and sets clear expectations. The Online Design Studio portal helps set clear expectations on available choices so customers are not trying to decipher and interpret what options are available," says Sherri Drew, Vice President of Design Studios for TRI Pointe. "It's also important for our design team to be able to finalize paperwork in a timely way and be sure we are ordering within the time frame available."



What's more, the tools help TRI Pointe's design sales team add a personal touch to client meetings by having the right samples ready to go and preparing ahead of time to answer specific questions.

For buyers earlier in the process, **educational touchscreens** in the Design Studios provide detailed information on product offerings and quick access to manufacturer portals that educate customers on products offered in the Design Studio.

The final resource is a **manufacturer video wall**. Set up

much like the wall of TVs you might see at a department store, these video feeds show loops of products and processes for insights into how materials are made, product quality, and more.

"With all of the technology these days, people have information at their fingertips; we weren't providing customers that experience—we were pulling out price books and asking them to decide the same day," says Drew. "Now they can sit in the comfort of their own home and make decisions while truly getting a look at what's to come."

The technologies are also improving team operations. The product portal works with the builder's enterprise resource planning system, so options that convert to a sale integrate into the system and automatically create purchase orders, which eliminates repetitive hand-entering that takes time and can lead to errors.

This also gives TRI Pointe access to helpful analytics, such as when customers log on, how much time they're taking to browse options, if items are added to a wish list but not purchased, and much more. And these insights, Drew says, are helping TRI Pointe boost revenue.

"People have expectations that we have these types of tools. Customers expect it with technology today," Drew says. "Two years ago, we didn't have these tools in place. It was a missed opportunity that we are now pleased to offer to our customers."

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Solar as Standard

With 2020 almost here, home builders and developers in California gear up to meet the requirement of solar photovoltaic systems on most residential new builds

by **MARK VOGEL**

WE ARE WEEKS AWAY IN THE COUNTDOWN to the 2020 solar mandates in California that require new single-family homes to include solar. This far-reaching energy policy was adopted last year by the California Energy Commission, and it requires solar photovoltaic (PV) electric systems to be installed on virtually every new residential dwelling built in the state. It will apply to all houses, condos, and apartment buildings up to three stories that secure building permits after Jan. 1, 2020.

Robert Raymer, technical director for the California Building Industry Association, said it best: “California is about to take a quantum leap in energy standards. No other state in the nation mandates solar, and we are about to take that leap.”

We are indeed at a crossroads between past and future as other states are expected to follow California’s lead and adopt similar policies. States like Arizona, Colorado, Hawaii, Nevada, New Mexico, and Texas are adopting new mandates and incentives that are giving solar a big boost. What does this mean for home builders?

The number of homes impacted by the mandates will be significant. Some 80,000 to 90,000 new single-family homes are built in California each year at present, and roughly 12,000 to 15,000 of those, on average, are outfitted with solar energy. All told, around 140,000 PV systems are up and running on single-family homes across the state, either retrofit or new-home installations. The solar mandates about to go into effect apply to new construction, so the number of single-family homes with solar installed is poised to increase from 140,000 to 150,000 to 240,000 to 250,000 in 2020 and thereafter.

“This is an undeniably historic decision for the state and the U.S.,” says Abigail Ross Hopper, president and CEO of the Solar Energy Industries Association. “California has long been our nation’s biggest

Adobe Stock/Panumas

solar champion, and its mass adoption of solar has generated huge economic and environmental benefits, including bringing tens of billions of dollars of investment into the state.”

FOUR KEY AREAS

The new CEC policy focuses on four key areas: smart residential PV systems; updated thermal envelope standards (preventing heat transfer from the interior to exterior and vice versa); residential and nonresidential ventilation requirements; and nonresidential lighting requirements. The standards also encourage demand responsive technologies such as heat pump water heaters, improvements to a building’s thermal envelope to enhance comfort, and energy savings by inclusion of high-performance insulation and windows

“Under these new standards, buildings will perform better than ever, and at the same time they contribute to a reliable grid,” explains Andrew McAllister, CEC commissioner and the organization’s lead on energy efficiency. “The buildings that Californians buy and live in will operate very efficiently while generating their own clean energy. They will cost less to operate, have healthy indoor air, and provide a platform for ‘smart’ technologies that will propel the state even further down the road to a low-emissions future.”

WORKING WITH PARTNERS

As the mandate takes effect, it’s vital that builders know where to turn for help navigating necessary changes to their design process and production workflow. Most of the larger builders in California have nearly a decade of experience under their belts and should be able to move forward without interruption as they design and build new homes come January 2020. Smaller builders may have challenges to overcome, however. Some have already jumped on the solar energy train, but those that haven’t could find themselves facing a steep learning curve. They should start to acquire the necessary knowledge and expertise to fully understand the “nuts and bolts” of solar power systems installation today.

One way to achieve this is to bring in an energy consultant or company with expertise and experience in California’s solar energy

CHALLENGES FOR BUILDERS IN LIGHT OF CALIFORNIA’S SOLAR MANDATE

Positioning and perception are everything for California home builders heading into 2020. Starting Jan. 1, all homes permitted for-sale of three stories or less in the state will be required to include solar energy. Ahead of the change, Ali Wolf, director of economic research for Meyers Research, examines the implications for consumers and challenges for builders.* by ALI WOLF

Affordability and lack of supply are two of the biggest issues in home building today. These challenges are even more pronounced in California, where just 8% of households can afford the median-priced new home in Los Angeles, 19% in San Francisco, 31% in the Inland Empire, and 33% in Sacramento; the national average, for comparison, is around 50%.

With affordability already an issue, adding in \$10,000 to the purchase price of a home for solar panels will inevitably cause some headaches for new-home builders. For example, some consumers will see that, all else equal, the price spread between new and existing homes is higher and opt for the cheaper option. Others may decide to spend less on options and upgrades to offset the \$10,000.

COSTS VS. SAVINGS

The focus, however, should really be on the monthly payment. We calculated that the change in the mortgage payment is just under \$40 per month when considering median home prices and current mortgage rates. The \$40 difference is the same whether one is buying a home for \$200,000 or \$1.5 million, making lower-cost areas more vulnerable. Here’s the cost breakout by select regions:

California average: 2% increase in the monthly payment

Central Valley: 3%+

Coastal Southern California: Roughly 1%

Bay Area markets: <1% difference

The 2020 mandate looks costly on the surface, especially for consumers who don’t place a high value on the technology, but adding solar panels is estimated to be a net gain for households (see the graphic below). Furthermore, unlike some regulatory fees that raise home prices without an obvious benefit, consumers can enjoy the utility of the solar panels.

One of the big challenges for builders will be highlighting the benefits of solar power without it feeling like just a sales pitch. That will be of particular concern in the markets with the most units in the pipeline (based on total units remaining of actively selling projects and the units planned we can count for upcoming projects). Using Zonda, we determined that builders in Los Angeles/Orange County, Riverside/San Bernardino, San Diego, San Francisco, and Sacramento will feel the most immediate impact of the new mandate.

California has 40% more sunny days than the national average, which supports the early push to embrace solar power. While the new mandate will not get close to making green energy pervasive (the new-home market comprises only 5% of overall housing transactions in California), the effort could lead other states to follow, especially if consumers realize the benefits as promised.

** For solar panels, there’s an option to buy or lease. This article focuses exclusively on the purchase option.*

Estimated Monthly Payment Change for Consumers From California’s Solar Mandate



Sources: California Energy Commission and Meyers Research

market. Solar consultants will need to understand design, equipment, and labor needs, and builders will need to plan and coordinate their build schedules and master plans for review and approval far in advance of the effective date.

“Builders should be lining up their supply chains now. They should also consider partnering with local, regional, and national solar firms in the California market to better coordinate and meet the new rules more cost-effectively,” advises Sean Gallagher, SEIA’s vice president of state affairs.

“One of the benefits of installing solar on new construction is the ability to integrate the solar installation with the design, planning, and construction processes,” Gallagher adds. “This significantly reduces the permitting time and makes the overall investment more cost-effective than retrofitting an existing home. In addition, new homes in California are so energy efficient that solar installations on new homes may be significantly smaller than average retrofit systems. Smaller systems and lower costs mean that initial costs for home builders should be more modest.”

Labor is another key consideration. California has been the perennial leader in U.S. solar power systems installations, so it has attracted a lot of experienced and aspiring solar energy professionals. The supply of skilled labor has kept up with growing market demand thus far. Nonetheless, it would be wise for builders to work closely on a continuing basis with product suppliers and installers to ensure they have the necessary inventory and skilled employees to complete projects now and into the future.

California has been a leading proponent of solar power for the past decade with its goal of reaching net zero energy usage by 2045, but other states are already following its lead. As similar policies become more prevalent, builders everywhere will need to be more in tune with the demands and requirements of structural design and implementation that optimize the performance of solar, as well as other clean energy systems. This new paradigm of energy partnerships is a win-win not only for home builders and buyers, but also for energy providers, people, and the planet.

Mark Vogel is president and chief operating officer at Petersen-Dean, a full-service, privately held roofing and solar company.

POWER PLAYERS

A look at some of the latest solar-related product offerings. by MARY SALMONSEN



SUNFLARE

The LiteMount series of rackless solar modules is designed to serve as an alternative to traditional silicon solar racks for metal roof placement. The modules integrate seamlessly with metal roof attaching systems, and weigh less than 1 pound per square foot installed. They are rated to handle a wind-load of up to 42 pounds per square foot and are shatter-proof, as they have no glass coating. A bypass diode is included at every cell, which keeps the panel active in any level of sunlight, apart from full shade. sunflaresolar.com



SOLARIA

PowerXT 370 Wp, PowerXT 365-Wp-AC and PowerXT 440Wp are new, higher-powered editions of Solaria’s existing solar panel series. The updated panels offer over 20% efficiency, a design with no visible circuitry, and a 25-year warranty. They also allow users to maximize their power output from their roof layout in a way that does not compromise the home’s aesthetics, says the firm. The PowerXT 365-Wp-AC includes integrated microinverters that provide an increased energy harvest from the panels and a decrease in installation time and overhead. solaria.com



LG

LG NeON R Ace is LG’s latest high-performance AC solar panel, set to be available for purchase later this year. It delivers a direct current power output of up to 375W alongside an integrated 320W micro-inverter. According to the firm, the fully integrated system saves time, space, and money for homeowners and installers, and eliminates the need to install a separate inverter. The panel is compatible with EnerVu, an app-based monitoring service, through the EnerBox solar accessory. Users can monitor the system via the app and alert LG customer service if issues occur. lg.com

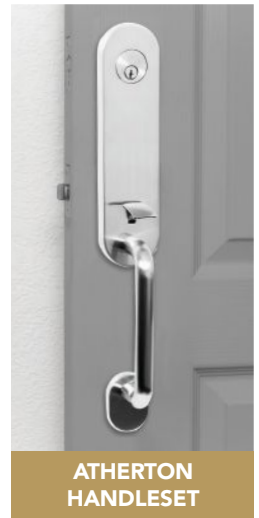


LIFTMASTER

The 12VDC Solar Residential Linear Actuator Package is a swing gate operator optimized for —and packaged with— a solar panel power source. The full kit includes the operator, control box, and a 12-volt solar panel, which provides up to 126 days of standby power to the gate operator. It is myQ enabled, allowing users to control and monitor the gate using the myQ app. The hardware includes a heavy-duty DC motor, offers smooth start/stop and mid-travel reversal, and provides industrial surge protection against strikes up to 50 feet away. liftmaster.com

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he Wm. S. Marvin Hall of Fame for Design Excellence annually recognizes visionaries who have left—and continue to leave—their mark on the residential housing industry and beyond. This year's inductees include Bryson Garbett of Salt Lake City-based Garbett Homes; Angela Brooks and Lawrence Scarpa of Brooks + Scarpa in Los Angeles and Fort Lauderdale, Fla.; and Washington, D.C.-based architect Robert M. Gurney. These individuals are being honored for their commitment to, execution of, and lasting influence on residential design.

Design's Vanguard





TEXT BY
**Robyn Griggs
Lawrence**
AND
Lydia Lee

PHOTOGRAPHY BY
Colin Lenton

BRYSON GARBETT

FIRM	Garbett Homes	
	LOCATION	Salt Lake City
FOUNDED	1988	
	NO. OF EMPLOYEES	43



01



02

01

PARKWAY STATION

These three-story, zero energy ready townhomes are walkable to dining, shops, and entertainment.

02

WYNWOOD

This zero energy ready home community includes 126 single-family homesites with prices from the \$400s.

03

GRANITE LEGACY

This high-performance, sold-out community of 75 homesites features four rambler and two-story home plans.

“

A

PRETTY BORING GUY”

is how Bryson Garbett refers to himself, but his 47-year career as a home builder in Utah, starting as an 18-year-old framer, certainly hasn't been dull. Salt Lake City-based Garbett Homes, which he founded after graduating from the University of Utah, is one of the state's largest and most innovative home builders, with more than 5,000 homes and apartments in 30 communities sprinkled along the Wasatch Front.

These aren't just any homes. Garbett builds zero energy ready homes, uber-energy-efficient houses that can offset almost all energy consumption with renewable energy (just add solar panels). The homes' contemporary style paved the way for other builders to step away from cookie-cutter design.

“Our contemporary design is really an immigrant from Mexico,” explains Garbett, who founded the nonprofit Foundation Escalera, which has built 180 schools to help kids out of poverty in Mexico, after his wife and eight kids spent their Christmas vacation on a mission trip to a small Mexican village in 1997. In 2006, Garbett built an upper-middle-class community in Queretaro, Mexico, that garnered a lot of attention from buyers in Utah who saw the contemporary homes on the firm's website. When the Great Recession hit, Garbett took a good, hard look at what his company could offer that no one else could—and modern, comfortable, sustainable homes was the answer. “We took that leap,” he says.

Garbett and KTG Architecture + Planning together created the Solaris Collection at Daybreak, super-tight, solar-powered and geothermal homes with HERS ratings under 40 (in Climate Zone 5) within a 4,000-acre sustainable master planned community in South Jordan, Utah. The homes turned heads with their modern exteriors, fiber cement siding, and vibrant color palette—ground-breaking design in Utah in 2013.

Over the years, Garbett's home design has evolved and adapted to Utah's heavy snow load, which isn't ideal for flat roofs. All of Garbett's

1. Anna Parris; 2. Stephanie Baughman; 3. Anna Parris



03

**GARBETT TOOK A
GOOD, HARD LOOK AT
WHAT HIS COMPANY
COULD OFFER
THAT NO ONE ELSE
COULD—AND MODERN,
comfortable,
SUSTAINABLE HOMES
WAS THE ANSWER.**

for-sale product is now contemporary (with the exception of municipalities that won't allow it). The homes are simple, built with quality materials, and stand out for their generous fenestration. "For energy efficiency, that's not necessarily your friend," Garbett says, "but for light and livability and for the design, it's very important."

For Garbett, building sustainable homes is about a lot more than solar panels, tankless water heaters, and HERS scores. "It's about livability, about health," he says. "All our homes have fresh-air systems because they're so tight. We've had reports from buyers that they've been able to get rid of their inhalers when they're in our homes."

Green building and healthy homes are slowly catching on in Utah, Garbett says, but his firm is still the only production builder in the state that provides HERS scores on every

home it sells. It's like shopping for a car that saves gas and having only one manufacturer provide mile-per-gallon ratings, he says, adding that the Utah Foundation predicts that as cars become more energy-efficient, homes will become the state's largest polluters. Home buyers are starting to catch on, if sales at Garbett's recent developments Granite Legacy and Wynwood—where home buyers camped out for two nights to be the first in line for the grand openings—are any indication.

"As far as green building goes, that's going to happen, I believe," Garbett says. "But I've believed that for a long time, and it really hasn't caught on. For home buyers, a certain amount of education has to go into it—that it's not just the home you buy, but what it costs to operate it and how comfortable it is. Now there's a good portion of the population that wants that. Not the majority, though."—R.G.L.





COMBINATION OF BALMY WEATHER, an open-minded culture, and never-ending traffic congestion have turned Los Angeles into fertile ground for architectural problem-solving. Thinking outside the typical residential box, Angela Brooks and Lawrence Scarpa have been using their creativity for the past 30 years to address two of today's most pressing issues: the housing shortage and climate change. Their innovative urban infill projects are helping to move LA's suburban-style neighborhoods toward higher density. "We operate as two parallel universes, where we have our traditional practice and also work on policy, so we can make the rules and take advantage of them," says Scarpa.

The strength of their designs make for powerful agents of change. Among Brooks + Scarpa's previous accolades are the 2010 American Institute of Architects' Firm Award and the 2014 Cooper Hewitt National Design Award for Architecture, which cited how the firm has gained "international acclaim for its success in marrying an innovative aesthetic with leadership in sustainable and socially progressive design, ingenious applications of building materials, and the incorporation of unique ideas about tactility and spatial experiences in design."

Brooks and Scarpa, who are personal as well as professional partners, both originally hail from Florida. They met at the University of Florida, where Brooks was an undergraduate studying design and Scarpa was working on a masters in architecture. Scarpa spent the first few years of his career working for Gene Leedy and then Paul Rudolph of the celebrated Sarasota School, a regionally specific take on modernism which emphasized indoor-outdoor flow and natural ventilation. They both moved out to LA in 1988, when Brooks entered the masters in architecture program at SCI-Arc. "I just wanted to help people and



ANGELA BROOKS & LAWRENCE SCARPA

FIRM	Brooks + Scarpa
LOCATIONS	Los Angeles and Fort Lauderdale, FL
FOUNDED	1991
NO. OF EMPLOYEES	20



**THE FIRM
pioneered
ENERGY-EFFICIENCY
STANDARDS WHILE ALSO
RAISING THE BAR FOR
DESIGN EXCELLENCE IN
AFFORDABLE HOUSING.**

make cities better,” says Brooks, who did her thesis on solving the problems of suburbia. After graduation, she worked for several years at the nonprofit LA Community Design Center (now Abode Communities), an affordable housing developer. Meanwhile, Scarpa had joined the small office of LA architect Gwynne Pugh. Brooks would moonlight at Pugh + Scarpa during crunch times in the office, and formally joined the firm as a principal in 2000. The two bought out Pugh’s share of the practice in 2010, forming Brooks + Scarpa.

Guided by Brooks’ passion for and expertise in affordable housing, the firm pioneered energy-efficiency standards while also raising the bar



02

01

THE SIX

This 52-unit affordable housing project in LA provides a home, support services, and rehabilitation for disabled veterans.

02

COLORADO COURT

Built almost two decades ago, this Santa Monica development was the first multifamily project to be LEED certified.

for design excellence in this often-unglamorous building type. Completed nearly 20 years ago, the 44-unit Colorado Court in Santa Monica was the first multifamily project to be LEED certified. With a dramatic façade of solar panels, a micro-turbine, and a passive cooling design that made mechanical air-conditioning unnecessary, the complex was nearly net zero over a decade before the concept became mainstream. From 2000 to 2006, the architects also ran their own think tank, called Livable Places. They introduced the concept of what became LA’s “small lot subdivision” ordinance, which encourages more-affordable infill housing by mom-and-pop developers; the ordinance passed in 2005 and a similar version has since been adopted by Oakland, Calif., as well.

Recently, Brooks + Scarpa wrapped up a multiyear project with the city of Fort Lauderdale to produce a guide for coastal development in the face of climate change and sea level rise. The “Salty Urbanism” manual should be available soon as a public document. The firm also won a \$1 million grant from the city of LA to prototype a turnkey solution for constructing permanent supportive housing; working with modules from Southern California-based Plant Prefab, it is designing different configurations that can be built quickly by developers and city governments. “We’re architects as city-makers,” says Scarpa.—L.L.

1: Tara Wujcik; 2: Marvin Rand

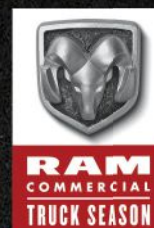
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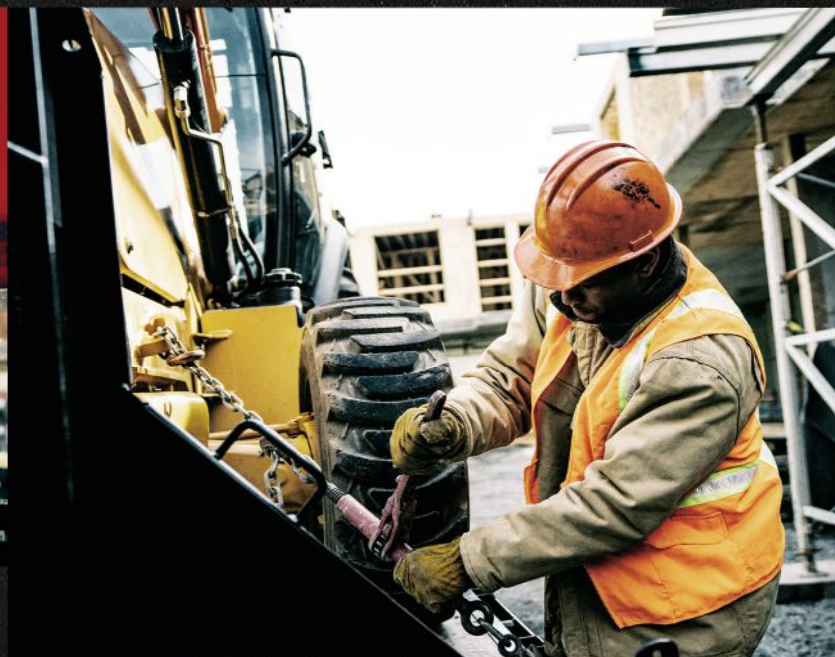
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FOR THE PAST THREE DECADES, architect Robert Gurney has been building homes for the Washington, D.C., elite who appreciate modern architecture. The “form follows function” ethos of the legendary Bauhaus school lives on in his minimalist compositions. But in other ways, he’s a maximalist, exploring a balance of horizontal and vertical lines in lieu of straightforward symmetry, and celebrating the rich textures of materials like hot-rolled steel and board-formed concrete. “He weaves together materials that are refined and raw. His work is this beautiful tapestry of materiality,” says fellow D.C. architect David Jameson.

Gurney developed a heightened appreciation for buildings from a very young age. He grew up in Staten Island, N.Y., in a brick house that was built by his father, a bricklayer and fireman. Gurney came to D.C. to study architecture and play basketball as an undergraduate at Catholic University, where he also got his master’s degree in architecture. In that design era, postmodernism held full sway; Michael Graves’ eye-popping Portland Building was completed in 1982, the year that Gurney graduated. But Gurney was most inspired by the work of D.C. architect Hugh Newell Jacobsen. “He was designing abstract versions of traditional houses, forms that people were familiar with,” says Gurney. “He did gable roofs with no overhangs and hidden gutters, floor-to-ceiling windows, and crisp, clean white interiors with no trim and baseboards.” Jacobsen also liked to break a house down into many volumes, creating different spatial experiences for its occupants, something that Gurney also took to heart.

Over the years, Gurney has worked on a wide range of residences, from urban infill projects to suburban homes to mountain and coastal retreats. For the first decade of his career, he worked as a sole practitioner, primarily on renovations and additions. But he was fortunate to gain an important mentor early on: Hugh

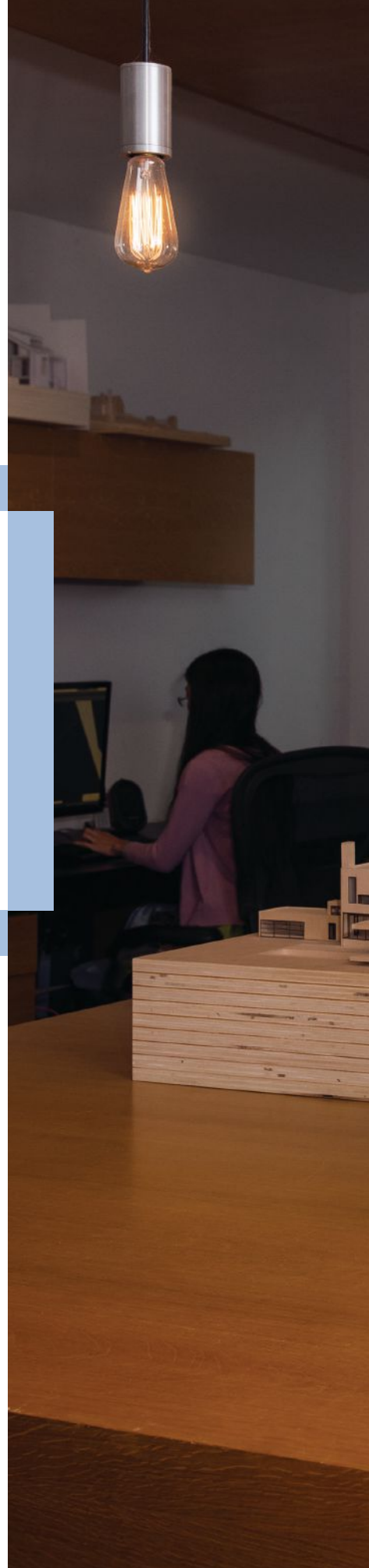
Newell Jacobsen himself. In the late ’80s, his wife, Therese Baron Gurney, who is an interior designer, took a job with Jacobsen’s firm, and the connection bloomed from there.

“Jacobsen was the grandfather with the gray beard that would give advice,” recalls Gurney. “He was doing incredibly beautiful houses all around the world, and he would recommend me for local projects.”

In 1999, Gurney completed his breakthrough project, the major renovation of a 1900 row house for the executive director of the American Institute of Architects’ D.C. chapter. For the Fitch O’Rourke residence, Gurney designed a contemporary rear facade and interiors. Receiving top honors for interior architecture from the national AIA in 2001, the home’s highlights include a distinctive fireplace of rusted steel and

ROBERT M. GURNEY

FIRM	The Office of Robert M. Gurney, FAIA
LOCATION	Washington, D.C.
FOUNDED	1990
NO. OF EMPLOYEES	6







01

"THERE ARE MATERIALS THAT AREN'T EXPENSIVE BUT HAVE VERY rich qualities, WHICH COME TO THE FOREFRONT IF YOU USE THEM IN UNEXPECTED WAYS."

01

4 SPRINGS LANE

Set on a 24-acre site in Rappahannock County, Va., this home optimizes views of the nearby Blue Ridge Mountains.

02

FITCH O'ROURKE RESIDENCE

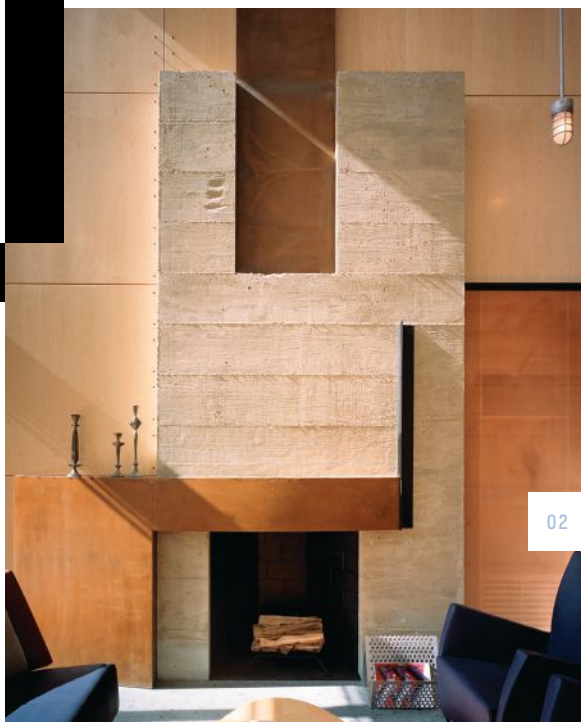
The fireplace is an artistic composition of geometric shapes and different materials.

board-formed concrete, and a screen of copper-wire mesh, suspended on pulleys, to cover built-in storage.

Among the projects Gurney has completed in recent years is 4 Springs Lane, a vacation home in rural Virginia. Gurney designed it to frame views of the Blue Ridge Mountains; the row of crisp, transparent volumes allow people in the backyard pool to see straight through the house to the distant landscape. Providing a counterpoint to all the glass, the house is clad in a mix of sleek black fiber-cement panels, warm-hued mahogany planks, and rough dry-stacked slate.

Gurney's material explorations continue in earnest, indoors and out. "There are materials that aren't expensive but have very rich qualities, which come to the forefront if you use them in unexpected ways," he says. For a high-rise condominium in D.C., he worked with a metal fabricator to remove some of the mill finish on hot-rolled steel in order to retain some of its reflectivity. Lining the interior core of the dwelling, the slightly silvery panels bounce natural light around the space and make it brighter. "I'm trying to make walls that are more tactile," he says. "Less drywall, more raw materials."—L.L.

1: Maxwell MacKenzie 2: Paul Warchoł Photography



02

TOOLS YOU WEAR

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TWENTY-ONE CENTURIES AGO, ROMAN MILITARY ENGINEER and architect Marcus Vitruvius proposed a simple, profound model to discuss housing innovation. Three principle themes for building—strength, functionality, and beauty—stood out to him as pillars, timeless measures of essential value. Improvements to those pillars are, by nature, transformative. For decades now, and foreseeably into our future, constraints of labor, lots, lending, and chronic human clashes amid architecture, engineering, and construction have blocked improvements to those pillars. Today, we celebrate 50 examples of people, processes, products, and platforms that dare to defy such constraints and release newfound strength, functionality, and beauty from the tight grasp of the future. Our 2019 Hive 50 list—spanning design, building technology, capital commitment, customer intelligence, and business and consumer strategy—highlights applied brilliance that reflects how the future now defines this community more so than the effect of all the past millennia put together.

Read on for a glimpse of why these innovations have been chosen. Visit hiveforhousing.com for full details, and vote for your favorite in the Hive 50 Innovator People's Choice Award at vote.hwhive.com.

Innovation in Housing

BY
JOHN MCMANUS

Strategy

01 BAYA BUILD

The Weaver

For aligning architecture, engineering, and construction processes in critical value chain relationships to one another to reduce time, waste, and transactional costs, and to amplify home-makers' engagement.

02 DENDO DRIVE HOUSE

The Turbocharger

For unlocking household-level giga power in vehicle-to-home bidirectional charging and battery storage, freeing residents from the grid, saving money, and reducing carbon emissions.

03 DIRTT

The Gamifier

For smashing boundaries between virtual and real by empowering an exponential interoperability between user preference and physical structure, to put responsive, nimble, livable interior space design on steroids.

04 FACTORY_05

The Catalyst

For empowering the needs and opportunity of the future to overcome the comfort, complacency, and constraint of past practices when it comes to solutions for housing.

05 IVORY PRIZE FOR HOUSING AFFORDABILITY

The Incubator

For investment by a builder in transformative solutions, an example of housing's private-sector commitment to make homes attainable to more working households.

06 KIN

The Friend Indeed

For bringing family-friendly,

purpose-built, sharing-economy community to city-based vertical living.

07 LENNAR*

The Self-Disrupter

For doing things differently in a business resistant to change, focusing on consumers' needs and using data about them to reduce friction in the path to finding a home.

08 PADSPILT

The Missing Link

For putting "missing middle" housing for working Americans on Atlanta's map, using data to network excess capacity of single-family homes into a co-living, property-as-a-service model.

09 RENORUN

The Deliverer

For amplifying jobsite productivity and construction velocity by reducing wind-shield time via an app-based, real-time materials and products delivery platform.

10 REYNOLDS LANDING

The Micromaster

For harvesting energy usage data to improve neighborhoods on a building-by-building basis, open sourcing community design, engineering, and construction toward regenerative energy.

11 STUDIO 804

The Educator

For profoundly expanding architectural learning beyond the classroom into the real-world challenge to build affordably priced, sustainable, safe homes.

Capital

12 CENTURY PARTNERS

The Reigniter

For betting on Detroit's fu-

ture, with grassroots-level work to repair neighborhood blight by proving working class households' ability to create regenerative value.

13 DIVVY HOMES

The Dream Catcher

For modeling a rent-to-own business that rewards lenders and investors and forges a path to homeownership.

14 FIFTH WALL

The Accelerator

For epic work at the crossroads of technology, data, and capital to make future homes and communities more attainable, healthier, and more valuable.

Intel

16 AUSTIN ENERGY GREEN BUILDING

The Pioneer

For setting a higher bar of ambition and achievement on building energy performance and its role in meaningful environmental and social healing and repair.

17 CITYMART

The Red Tape Cutter

For simplifying how cities and communities do business, streamlining public urban procurement processes to fast-track contracts and improve outcomes.

18 CLAYTON HOMES*

The Game Changer

For inspiring its staff to "open doors to a better life" to restore the dream of homeownership to be within reach of more working people.

19 COURBANIZE

The YIMBY-fier

For empowering neighborhoods and developers to learn and make evidence-

based choices in development permitting by bringing community issues into an elegant user experience and engagement platform.

20 EVOLVELAB

The Decoder

For amplifying generative and computational design's role in skilling architects, engineers, and builders to work together to achieve results that add up to greater than the sum of their parts.

21 FINREGLAB

The Convener

For navigating paths toward influencing faster-track, tech-enabled financial solutions that can unlock barriers to housing and community access for more people.

22 GRIDICS

The Heat Mapper

For subtracting the obvious and adding the meaningful in 3D visualized, hyper-locational data, filtered to improve real estate, design, and construction planning and decision chains.

23 HAYWARD SCORE

The Diagnostician

For championing health hazard-free buildings with a scientific score to empower residents to use conditions metrics to improve health and well-being at home.

24 MILLIE BY ZEGO

The Channeler

For networking digital amenities in apartment living, so residents and building property managers can live better and work smarter.

25 SYMBIUM

The Permitter

For fast-tracking development and building permits and approvals by creating a

15

Capital

Home Partners of America*

The Pathfinder

HIVE 50 HONORS

For removing financial friction from working households' path to homeownership and restoring agency to people on the rent-to-own trail.

WHAT YOU NEED TO KNOW

Home Partners of America works to elevate the motivation, the financial wherewithal, and the personal efficacy of people at the household level. The program, over time, transforms people who would not qualify for a mortgage loan into ones who do. HPA has purchased over 12,000 homes in 40 metro markets and 20 states nationwide for a total investment of over \$3.5 billion. Over 800 HPA resident households have exercised their "right to purchase" and have bought their home from HPA using the lender of their choice.

WHO'S INVOLVED

Former Goldman Sachs executive William J. Young is the CEO, chairman, and a founder of HPA. Real estate mogul Sam Zell and mortgage securities innovator Lewis Ranieri have served as investors/advisers. HPA has partnerships with Coldwell Banker, Century 21, ERA, and Better Homes and Gardens; investors include BlackRock Private Equity Partners, Kohlberg Kravis Roberts, Range Light, and THL Credit.

WEBSITE

homepartners.com

Zero Mass Water*

The Rainmaker

HIVE 50 HONORS

For securing resilient, off-grid access-via thermodynamics, materials science, and controls technology-to one of life's precious essentials, water made from thin air, and making it an unlimited resource at a household level in any geography.

WHAT YOU NEED TO KNOW

Founded in 2014, Scottsdale, Ariz.-based Zero Mass Water is doing for water what rooftop solar has proved to be for electric power, a harvesting device for molecules that converts environmental air into potable water by adding sunlight. Zero Mass Water's Source Hydropanels extract water vapor from the air to make, mineralize, and deliver drinking water to communities, refugee camps, government offices, hotels,

hospitals, schools, restaurants, and homes. In arrays of two 4-foot-by-8-foot hydropanels, in more than 33 countries on six continents, Source filters air before it passes through the system and water is kept clean with ozonation inside the integrated reservoir.

WHO'S INVOLVED

Cody Friesen, founder and CEO of Zero Mass Water and recipient of the 2019 Lemelson-MIT Prize. Series B and Series C investors-raising \$22 million in March 2018, and \$25 million in October 2018-include Skip Battle, Arnerich Massena's 3x5 Partners, a growth-oriented fund, and Boston-based Material Impact. Partners include the Asian Development Bank, USAID, ARENA, Duke Energy, and the Royal Jordanian Court.

WEBSITE

zeromasswater.com



human-centric, end-to-end web-based template, loaded with local regulations and codes, for applications.

Building Technology

26 ANDERSEN EASY CONNECT JOINING SYSTEM

The Combinator

For elevating a commoditized product category to a new solutions level, improving building processes for faster and accurate window and door assembly.

27 HOWICK

The Translator

For boosting construction automation's potential by amplifying the fluency of links between digital modeling and physical tooling.

28 INFINITE PANEL

The Enveloper

For simple, elegant, and profound building solutions that blend structural purpose and performance as they elevate façades' aesthetic value in improving our communities.

29 INNOVATE 2019 CHALLENGE

The Matchmaker

For empowering the movement of world-changing building materials ideas from labs, white boards, and process maps to real-world, built-environment impact.

30 INTELLIGENT STRUCTURAL PANEL BY WZMH ARCHITECTS

The Synthesizer

For breaking the mental and physical barriers separating a building envelope and its systems, infusing intelligence and user experience into physical, load-bearing structural members.

31 MNMMOD BUILDING SOLUTIONS BY MINARC

The Shell Shocker

For spreading word on the fire-and-termite resistant potential of structural kit-of-parts assembly featuring recycled steel and EPS panels, produced in factories and erected waste-free on site.

32 OAK RIDGE NATIONAL LABORATORY

The Crystallizer

For applied materials science brilliance, creating 3D-printing solutions of molds for pre-cast concrete façades that look like sugar crystals in the New York Harbor skyline.

33 WATER RESOURCE RECOVERY CENTER

The Converter

For tapping bio- and chemical science and hydraulic engineering to convert scavenged municipal waste into room air comfort, exchanging sewer flow for BTUs to power net-zero-energy buildings.

34 WE PRINT HOUSES

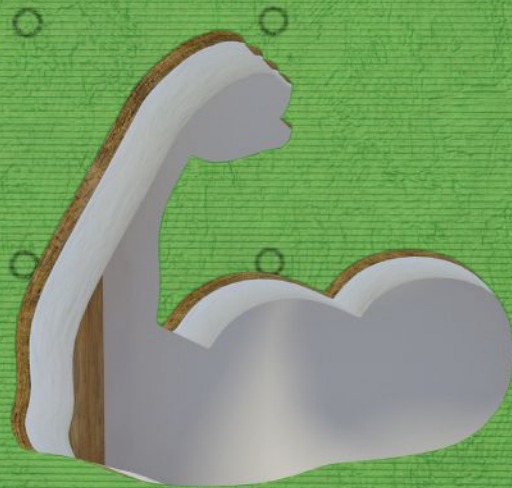
The Printer

For printing homes using hydrophobic, self-binding, proprietary geopolymer cement from a printhead on a mobile platform, eliminating the need for subcontracted crews.

35 WILLIAMS ROBOTICS

The Rocket Scientist

For robotics unbound, a real-world platform that splices computational code and micro-precision mechanical engineering into a stud wall construction machine.



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Design

37 BACKYARD BI(H)OME

The Multiplier

For reimagining accessory dwelling unit structure to make it an attainable option for more backyards.

38 B-AUSTIN COMMUNITY

The Placemaker

For subtracting the obvious and adding the meaningful, the heart of simplicity, connectivity, and well-being in multifamily neighborhood design and development.

39 BEACH GREEN DUNES

The Renewer

For making Passive House attainable to low-income, special needs, and workforce households, to secure them resilient access to energy and safety resources in coastal urban areas.

40 BILL SORRO COMMUNITY

The Balancer

For bringing renewed vitality

to San Francisco's Sixth Street Lodginghouse Historic District with units for low-income families and developmentally disabled adults.

41 BLOCKHOUSE | LIFE

The Bottom-Liner

For breaking ground in making a community for triple-bottom-line future fitness, a holistic approach to profitably designing, developing, and manufacturing that benefits people and the planet.

42 ECOHOUSE

The Groundbreaker

For a real-world exemplar of ecologically minded, fossil fuel-free home resilience, able to operate by securing continuous vital access to essential resources independent of the grid.

43 ECOLOGICAL LIVING MODULE

The Globalist

For unleashing the power of

230 square feet to change how the world views what can be done to house people in a net carbon-positive future.

44 MULTIFAMILY EXECUTIVE CONCEPT COMMUNITY

The Challenger

For committing to what should be nonnegotiable in ambition and purpose rather than accept what is at the confluence of architecture, construction, and engineering.

45 NEST TOOLKIT

The Transformer

For challenging preconceptions and models of what can be done to make safe, healthy homes accessible for society's economically, physically, or mentally vulnerable people.

46 OAK PARK HOUSING

The Reanimator

For breathing life, safety, sustainability, and comfort into 12,000 square feet of

long-vacant infill space in Sacramento.

48 OPTIMA DCHGLOBAL BUILDING SYSTEM

The Repurposer

For collapsing time barriers between design and occupancy by using recycled steel and glass to create resilient structures from prefabricated, modularized components.

49 RAAD STUDIO BEACH HOUSE

The Hydrodynamo

For empowering an evidence-based vision of a virtuous circle of humans living in nature, with sanctuary as a harmonized go-between, porous to water and wind.

50 TINY TOWER BY ISA

The Stairmaster

For mining untapped potential in infill properties not often recognized as building sites, using precision vertical construction and design.

Design

47 Oceanix*

The Seasteader

HIVE 50 HONORS

For imagining and charting policy, capital, design, development, and construction seas that need to be sailed to save and repair the two-thirds of Earth covered by oceans as well as their coasts, which are inhabited by 2.4 billion people.

WHAT YOU NEED TO KNOW

This past spring, entrepreneur Marc Collins Chen, his company Oceanix, and a group of collaborators ranging from famed architect Bjarke Ingels and his firm to experts in zero waste,

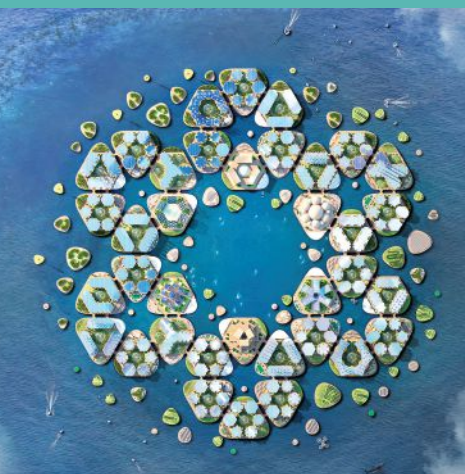
water engineering, plant-based community farming, mobility, and energy-efficient design unveiled Oceanix City at the United Nations in New York. Partners revealed plans for what a sustainable floating city might look like. They laid out a plan based on 4.5-acre hexagonal floating islands [about the size of three and a half football fields] that each house 300 people. In turn, a scalable model imagines each floating island as part of a six-island cluster that could serve as a village, six of which could aggregate to a city of 10,000.

WHO'S INVOLVED

Partners with the United Nations-Habitat include Bjarke Ingels Group (BIG), Studio Other Spaces, Center for Zero Waste Design, Mobility in Chain, MIT Center for Ocean Engineering, Dickson Despommier, Sherwood Design Engineers, Transsolar KlimaEngineering, and Global Coral Reef Alliance.

WEBSITE

oceanix.org





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Will Upzoning Help Housing Affordability?

Minneapolis leads the charge for more affordable housing

by GREG UGALDE, NAHB CHAIRMAN OF THE BOARD

BUYING A HOME IS, FOR MOST AMERICANS, the most significant investment of their lives. Not only does homeownership help build equity for retirement, but it also can be the key to unlock societal upward mobility. But housing is not as affordable as it used to be.

The 2019 version of the National Low Income Housing Coalition's Out of Reach report found that a full-time minimum wage worker could not afford a modest two-bedroom apartment in any U.S. city. And low-wage workers aren't the only ones struggling.

The hourly wage necessary to afford a modest home without spending more than 30% of annual household income on housing is called the "housing wage." In California, that wage is nearly \$35/hour; in Kansas, it sits right around \$16/hour.

In my home state of Connecticut, a minimum-wage worker earning \$10.10/hour would have to work 81 hours a week to rent a modest one-bedroom house. To be able to purchase a typical two-bedroom home, the average worker would need to earn over \$25/hour. My point in all of this is that we are experiencing a housing affordability crisis.

You might have heard some cities are trying to "ban" single-family housing. While this is a bit misleading, there are efforts across the country to engage in a residential zoning practice known as "upzoning," or changing zoning laws to accommodate an increase in housing density. It's basic economics: as supply goes up, demand and price go down.

Most cities are zoned for primarily single-family housing (the average is around 70%). However, vestiges of racial discrimination in

housing and income inequality have created barriers to inter-community upward mobility. Upzoning could be a solution.

Over the past year or so, some states and cities have begun to craft upzoning legislation. Minneapolis led this charge by proposing the Minneapolis 2040 plan in December 2018, which relies heavily on upzoning to create more affordable housing.

In June of this year, Department of Housing and Urban Development Secretary Ben Carson visited Minneapolis to meet with city leaders and discuss the proposed plan. One of the goals of Minneapolis 2040 is for every resident "to be able to afford and access quality housing through the city." Carson said he would like to "see more cities follow the lead of Minneapolis and eliminate single-family zoning, opening up every neighborhood to higher-density housing."

The plan has not been spared the effects of NIMBYism. Those in opposition to the plan have cited concerns over its implementation, including the question of diminishing home value with the introduction of duplexes, triplexes, and apartment buildings into historically single-family communities.

Progressive groups are concerned housing will be developed only in neighborhoods where it is cheapest to build, resulting in more displacement and less mobility for those already most impacted by zoning laws.

Builders are also concerned: City officials have touted the creation of residential construction jobs from this initiative, while also calling for a reduction in parking available for residents to encourage the use of public transit. This could prove difficult for builders who



need to be able to haul equipment between jobsites and then park their trucks at home.

In response to the plan's opponents, Minneapolis Mayor Jacob Frey told CityLab: "There's always resistance, of course. It doesn't mean that it's not the right thing. I believe strongly that housing is a right. I believe that everyone should have a safe place to go home to at the end of the night, to rest their heads on a pillow and rejuvenate for the next day. Clearly that right is not afforded to everyone."

Frey has been clear in his desire to combat the negative effects of non-inclusive zoning practices: "We need to make sure that the precision of our solutions match the precision of the harm initially inflicted... and that harm was precise." Pending final action, the Minneapolis 2040 plan will take effect on Nov. 16.

We need solutions to make housing more affordable to more Americans and to make our communities more inclusive. Could upzoning be one of those solutions?

The Road Toward Resilience

HUD awards Home Innovation with a contract to develop residential resiliency guides

by HOME INNOVATION RESEARCH LABS



RESILIENCE. IT'S A TERM HEARD MORE AND MORE. BUT IT'S NOT just another buzzword. It's the new frontier for residential construction that will drive innovation in our industry for decades to come.

Improving resilience is a complex, multifaceted task that involves the interaction of all aspects of developing, inhabiting, and governing the built environment. Builders need a defined road map for putting resilience into practice. Home Innovation Research Labs has just been awarded a two-year, \$400,000 contract from the U.S. Department of Housing and Urban Development to create that road map.

Under this contract, Home Innovation's expert team and Advisory Group will produce a set of practical, actionable guidelines for builders and developers to design and construct residential buildings, neighborhoods, and accessory structures to improve

residential resilience and integrate that resiliency with the entire community. The focus will be on new construction and major reconstruction after natural disasters—especially reconstruction in areas where entire communities need to be rebuilt after significant events. The guidelines will not focus on minor repairs or renovations that are common after most natural disaster events and will not address non-residential buildings. Regional and climatic differences will be taken into account, and the standards will provide guidance on how to effectively interact with local ordinances and broader community resilience and operations plans.

Since metrics are a critical part of meaningful, long-term resiliency, they will be a core element of the guides for builders and developers. Resiliency metrics will include:

- identifying and defining natural hazards, disaster preparedness, and disaster resistance;
- ability to function during and immediately after the disaster;
- ability to quickly recover;
- ability to get back on the path of growth;
- on-site and community renewable power generation;
- grid independence and grid interaction;
- durability of building materials and systems;
- integrated community development;
- economic suitability;
- social equity; and
- communication plans.

Since the ANSI development process is part of Home Innovation's corporate DNA, project managers will employ many ANSI protocols when assembling the advisory group, developing the content, and requesting public input. To help create these important guidelines for builders and developers, the application for the Residential Resiliency Guidelines Advisory Group is available at HomeInnovation.com/ResilienceAdvisoryGroup. Applications will be accepted through Nov. 18; selected members will be announced in early December.

For more information on these efforts, submit a request at HomeInnovation.com/ResiliencyGuideContact.

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Closing the Gap

Lessening the gap between median prices for new construction and existing single-family homes is crucial

by **ROBERT DIETZ, NAHB CHIEF ECONOMIST**

THERE ARE A NUMBER OF FACTORS THAT MAKE THE POST-GREAT Recession housing market unique among recent business cycles. A persistent skilled labor shortage, growth in land development and regulatory construction costs, a years-long period of under-building, and a sustained decline for housing affordability define the economics of the housing market over the past decade and have led to an affordability crisis. These supply-side headwinds have left clear evidence on the relative prices of new and existing homes.

For decades, there had been a fairly stable gap between median new and median existing single-family home prices, as measured by the Census Bureau and the National Association of Realtors. From 1990 to 2008, this gap was approximately \$20,000, meaning that as prices for both types of homes increased, the typical new construction single-family home was \$20,000 more expensive than the typical resale of an existing single-family home.

As NAHB research has shown, for a typical newly built single-family home, about one-quarter of the final sales price is due to regulatory costs and burdens. Lowering such costs will help reduce construction expenses and improve housing affordability.

After the Great Recession, this stable gap ended. From 2008 to 2013, a period defined by the Great Recession and the stimulus era of the home buyer tax credit and declines for single-family construction, this gap expanded from \$20,000 to \$92,000. Why? This occurred because builders shifted away from the entry-level market and concentrated on larger, more expensive homes. This was the right business strategy because this market had both sufficient housing demand and available financing for builders to develop these kinds of homes.

From 2013 to 2017, this gap in home prices was volatile but ranged from \$45,000 to \$90,000 as the market faced a perfect

storm of headwinds (essentially the 5 Ls of supply-side challenges: lending, lots, labor, laws/regulatory concerns, and lumber).

However, two developments changed the market in 2018. First, for the past few years, new-home size has fallen as builders have slowly increased construction of entry-level homes. This composition change in the inventory mix held down the median price of new homes. And during the second half of 2018, higher mortgage interest rates caused a slowdown in price growth for new and existing homes. But more fundamentally, the decline in affordability led builders to increase use of price incentives. NAHB estimates that such incentives increased in use from 10% to 40% for new-home sales.

The result was a downward trend for median new single-family home prices, which peaked at \$343,400 in November 2017 and fell to \$328,400 in August 2019. While the gap in the August data increased to \$47,700, the difference between new and resale prices has likely passed its peak for the cycle. As market demand rebounds due to lower mortgage interest rates, the gap is unlikely to close back to \$20,000. But it will find a new range of \$20,000 to \$40,000 as construction at the entry-level expands.

While a smaller gap is a challenge as construction costs continue to rise, from a macro perspective limiting the size of this gap is key to increasing overall home construction volume. Policy would help, of course. As NAHB research has shown, for a typical newly built single-family home, about one-quarter of the final sales price is due to regulatory costs and burdens. Lowering such costs will help reduce construction expenses and improve housing affordability.

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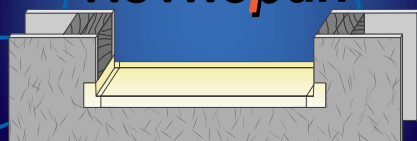


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Fine Wining

by SYMONE GARVETT

OUTFITTED WITH NUMEROUS MODERN FARMHOUSE DETAILS, the Camden model by Clay, N.Y.-based builder Cornerstone Homes was designed and built for the Home Builders and Remodelers of Central New York's 2019 Parade of Homes. The one-story plan, with a spacious finished basement, stretches 4,253 square feet and includes several custom built-ins designed to complement the home's on-trend style and main functions.

In the formal dining room, a built-in wine wall draws the eye into the space situated directly off the foyer and great room. The lighted case holds 40 wine bottles, which are laid out in a symmetrical grid and supported horizontally with Vino Pins in a black anodized finish. Heavy glass doors with matte black handles accent the focal point while dimmable, recessed LED lights add ambience to the room, providing a perfect spot to host upcoming holiday meals.



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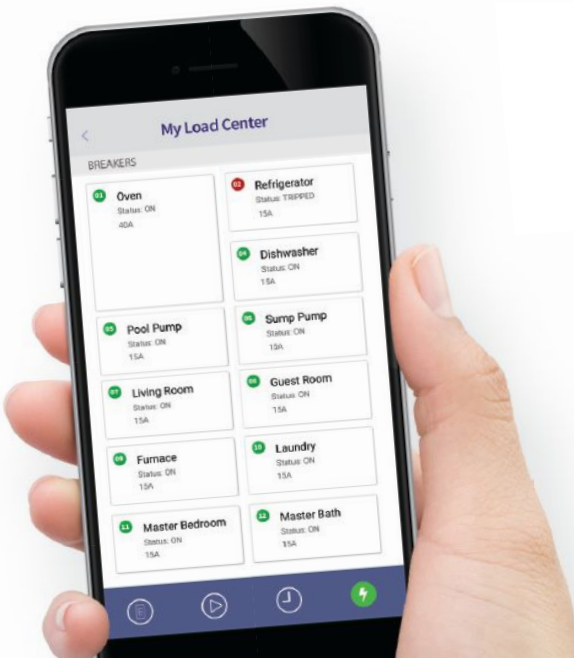
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