Award-Winning Coverage of Sustainable Construction, Products and Lifestyles

# **GREEN HOME OF THE YEAR AWARDS**

From urban infill to modernistic marvels, we salute the year's best projects.

January/February 2019 / www.greenbuildermedia.com

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# EDITOR'S NOTE The Inside Scoop

**By Matt Power Editor-in-Chief** 

# **Engineering With Heart**

Bringing building science and beauty together doesn't happen accidentally.

T'S VERY EASY TO GO WRONG. I think of my poor neighbor, who remuddled together some cliché ideas about luxury with efficiency upgrades, festooning his bright and airy apartment building with dark wood floors, crypt-like basement bedrooms, and over-the-top moldings and cabinetry, to end up with a colorless, gloomy space with the feng shui of a hotel lobby. It's a common problem: good building science undone by imitative design.

One of things I love about this annual issue, honoring the best green homes in the nation, is that true artistry supports the science of building these

great homes. That doesn't mean every project involved an architect or design pro. But I'd hazard to say that a good builder knows his or her design limitations and asks for help when a keen eye is needed the same way a good editor relies on a graphic designer to make a publication more than gray text and photos.

But the same principle applies to product innovation and even



city planning. Composite decking material that's impervious to moisture and rot, and lasts 50 years, represents a huge upgrade from wood. But if it lacks texture and color, it may not last in the marketplace. The same is true of city sustainability. Will we use bike paths that cut through urban blight in dark byways?

I bring up these latter examples because for the first time this year, our awards program is honoring product innovators and sustainable city planners, along with fine-home builders. We've put a lot of our own passion into this issue to identify and honor leaders in sustainability at all levels,

and introduced a new, special award for the year's "Sustainability Superhero."

We live in uncertain times, yet perhaps that has always been the case. These tangible homes, products and people demonstrate that real results, motivated by real heart, lie within our means. Let's take this moment to celebrate, to wonder and applaud some worthy efforts. GB







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# **Green Building NEWS**

The Latest on Sustainability and Renewable Energy

# **Study: U.S.-Made Carpets Are Contaminant Heavy**

Researchers say recycling is a key to cutting down on industry-produced toxins.

• OXIC SUBSTANCES ARE FOUND in nearly every major brand of carpet in the U.S., according to a report by researchers at the Ecology Center (EC), Global Alliance for Incinerator Alternatives (GAIA), and Changing Markets Foundation (CM). The study is the first of its kind to test the nation's six leading carpet brands for specific toxic chemicals.

According to the study, 60 percent of flooring sold in the U.S. is carpet, with 11 billion square feet sold per year. Of that, less than 5 percent is recycled, and less than 1 percent is recycled and turned back into carpet. More than 4 billion pounds of carpet is annually dumped in American landfills or burned in incinerators, releasing deadly pollutants into the air, soil and water.

Major contaminants include per- and polyfluoroalkyl substances (PFAS). These are associated with cancer, hormone disruption, obesity and developmental disorders, and were detected in six of the 12 carpet samples tested. Five carpets were found to contain phthalates, a plasticizer often used in PVC carpet backing that has been linked to hormone disruption and reproductive and neurobehavioral impacts in children. And many samples included 4-nonylphenol (branched), a chemical used in affordable housing projects, and attributed to developmental and reproductive disorders.

In contrast, results from earlier testing of carpets sold on the European market detected no toxic substances in three carpet samples, including two carpets with recycled content. And only one European carpet tested for PFAS, compared to six U.S. brands.



Unclean element. Nearly every major brand of carpet in the U.S. contains some type of toxic substance, a far cry from European counterparts.

"Considering America's growing carpet waste crisis, municipal governments are rightly under increasing pressure to increase recycling rates." says GAIA Associate Director Monica Wilson. "We must fundamentally transform the carpet industry to minimize waste, including banning toxic substances from carpet, and incentivizing the design of safe and fully recyclable carpets." GB

# **Report:** Wildfires Will Drive Fiber Cement Siding Boom

Heading into the next decade, the construction market will see increasing demand for heat and fire-resistant exterior materials.

HE GLOBAL SIDING MARKET is expected to reach an estimated \$102 billion by 2023—up from \$970 million in 2018—primarily because of increasing construction activities, growing repair and maintenance of building exteriors, and a rise in the hospitality

industry, but also because of growing risks from climate-driven fires and heat, according to a new market report by Lucintel.

Lucintel forecasts that although vinvl will remain the largest material type due to low material and maintenance costs, fiber cement will witness the highest growth during the forecast period due to its eco-friendly nature and fire-resistant property.

The firm cites other trends that will have a direct impact on the dynamics of the siding market, such as the growing use of sidings with good insulation, to reduce energy consumed by HVAC equipment in all climates. Vinyl, which begins to melt at about 160 degrees Fahrenheit.



Fire Ready. Increasing wildfire risks and extreme heat will drive the growth of fiber cement and fire retardant sidings in coming years.

may quickly lose its market dominance to more stable products, if summer temperatures continue to rise. GB

Lucintel's report is available at https://bit.ly/2VV0Jox.

# Go West, **Green Builder**

If you want to see or sell a sustainable home, try the West Coast.

NYONE LOOKING FOR a sustainably made house to buy, repair or upgrade should head out West—nine of the nation's 11 greenest cities are on the West Coast, according to a report by financial services firm WalletHub. Of those 11. seven are in California, including the top two: San Diego and San Francisco. The only East Coast city near the top is Washington, D.C., at #3. Other cities in the top 10 (from #4 to #10), are Irvine. Calif.: San Jose; Honolulu; Fremont, Calif.; Seattle; Sacramento; and Portland, Ore. According to WalletHub analyst Adam McCann. to determine the cities promoting an environmentally friendly lifestyle, WalletHub compared the 100 largest cities across 26 key green indicators ranging

from greenhouse gas emissions per capita to number of smart energy policies and initiatives to green job opportunities. "Apart from employing Americans, clean energy and other green practices, such as recycling programs and urban agriculture, benefit the environment and public health—all of which contribute to America's bottom line," McCann says. "Recognizing those advantages, cities across the U.S. have increased their sustainability efforts and benefited economically."



Going very green. More environmentally friendly homes are appearing in Western states than elsewhere in the U.S., according to a new WalletHub survey.

On the flip side, cities at the bottom of the WalletHub report are the least green, and could be a challenge for builders. That would begin with #100—Baton Rouge, which finished in the bottom five in all four major categories: environment, transportation, energy sources, and lifestyle and policy. GB

The report is available at https://bit.ly/2RKXsZJ.



A mandated effort. An ordinance requiring solar panels on new homes in California takes effect in 2020.

# **California Sets Mandatory Solar Roofing Law**

### The Golden State will be the first in the nation to require photovoltaics on new homes.

LL NEW HOMES BUILT IN CALIFORNIA as of 2020 or later must include solar rooftop panels, following unanimous approval by the State's Building Standards Commission. California is the first state I in the nation to mandate solar-energy installations on most singlefamily homes as well as multi-family residential buildings up to three stories, including condos and apartment complexes. The State estimates that the standards will save California residents and businesses millions in energy costs.

"We hope other states will look at what California has done and consider similar policies to encourage clean and low-cost solar energy," says Sean Gallagher, vice president of state affairs for the Solar Energy Industries Association.

While there are no true opponents to the mandate, some in the building industry are concerned that it may result in higher home prices—and reduced affordability in one of the nation's most expensive states. The California Energy Commission expects that the requirement will add about \$9,500 to the cost of a new home, but generate about \$19,000 in energy savings over a 30-year period. GB



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Matt Power Editor-in-Chief matt power@gr enhuildermedia com 207-619-2713 Alan Naditz Managing Editor

**EDITORIAL** 

alan.naditz@greenbuildermedia.com 916-681-2057 **O'Brien Design** Art Direction

iohn.obrien@greenbuildermedia.com 207-865-9908

Therese Workman Copy Editor info@greenbuildermedia.com

Melissa Smith Web Editor / Cognition Project Manager melissa smith@greenbuildermedia.com

PRODUCTION Mary Kestner Production Manager

marv.kestner@greenbuildermedia.com CIRCULATION

Mary Kestner mary.kestner@greenbuildermedia.com

> **GENERAL INFORMATION** admin@greenbuildermedia.com

FINANCE Dan DeGolier Chief Financial Officer dan.degolier@greenbuildermedia.com

Hannah Judson Controller hannah.judson@greenbuildermedia.com 970-397-5483

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AUTOMOTIVE ADVERTISING SALES **Dawn Rivard** 

dawn@focusmm.net 586-214-0635

**GREEN BUILDER MAGAZINE EDITORIAL OFFICES** PO Box 97 Lake City, CO 81235 303-246-8890 www.greenbuildermedia.com

**GREEN BUILDER MEDIA LEADERSHIP** Sara Gutterman CEO sara.gutterman@greenbuildermedia.com 303-246-8890

> Ron Jones President ron.jones@greenbuildermedia.com

Cati O'Keefe Chief Development Officer / Editorial Director cati.okeefe@greenbuildermedia.com 513-532-0185

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Now you can find digital versions of those archived stories and issues online-free to our print subscribers. We've been steadily adding past issues to our content archive, and the collection is almost complete. Just go to our website: www.greenbuildermedia.com,

and click on "Magazine" to find the archived content you need.

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With daily travel, instead of setting sights on the destination, people can focus on the journey.

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### HERE'S A SAMPLE OF WHAT'S INSIDE

"The challenges of living in boxes, with little to no personal space, and a kitchen consisting of no more than a table, hot plate and microwave are obvious. But fending off construction dust in a home with no roof. doors or windows made this experience truly memorable." (Page 42)

### **ON THE COVER**

**HOTY Grand Winner Rowe-Toogood house** Artist: Ross Chandler Photography

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**Sustainability Sustainability Sustainability Green Innovatio Urban Sustainal** 

# **GREEN BUILDER®** Sustainability Awards 2019

**REEN BUILDER'S inaugural Sustainability Awards** recognize people and companies that have shown exemplary skill, commitment and creativity in solving environmental challenges.

In this issue, we honor our first-ever Sustainability Superhero, along with three progressive city programs that are making bold strides on energy efficiency and more, along with a dozen outstanding innovators in the green marketplace.

Congratulations to our latest, greatest award winners.

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### **GREEN BUILDER** Sustainability Awards 2019 SUSTAINABILITY SUPERHERO

### **GREEN BUILDER** SUSTAINABILITY SUPERHERO Sustainability Awards 2019

presentation or write something" about sustainability to help get the word out, is also happy to give tours of his home to encourage people to think green. "There's probably been more than a dozen [tours] and a couple open houses," he says. "We had one during the actual home construction, which we called a 'bones and brains' event. We brought the contractor [Winsome Construction] and the subcontractors in, and invited anyone who wanted to know more about green housing."

There's a lot to show off. The house offers a number of green "must-haves:" A rooftop, 10-kilowatt solar electric system, nine types of insulation, triple-pane windows, LED lights and energy-efficient appliances keep the electric bill to only service fees for half of the year. The entryway framework and siding was built with hand-hewn timber salvaged from a century-old barn and old water tanks. A sealed woodstove offers energy-efficient heat without impacting indoor air quality. The home's heat recovery ventilator (HRV) offers even cleaner air. And so on.

Visitors love it, Good says. "Most people don't have the opportunity to see a home during construction," he notes. "They learn a lot. For example, when we talk about the notion of green building, most of our clients are fairly savvy about electricity and the saving of energy. They understand concepts like LEDs, solar panels and insulation. But they don't know much about indoor air quality. I'm really amazed how many of our new clients have never even heard of an [HRV]."

### A PERSONAL LEARNING CURVE

Because Good himself knew little about the physical homebuilding process-and its various challenges-he became the job superintendent during construction of his own home. In retrospect, he now realizes he was more of "job site cleanup crew." But even that proved educational. What Good learned about most was the recycling process. "It's disgusting how much construction waste we have," he says. "[Workers] leave their lunch bags, their tubes of caulking, the cardboard boxes, the packaging...they leave it everywhere. It reached the point where I had to remind and require people to bring it back out if they brought it in."

Nathan Good Architects works with its homebuilders to reduce waste and encourage construction site recycling. The firm also coordinates with county officials to ensure that some of that notquite-waste-such as clean scrap wood, cardboard and Styrofoam packaging—ends up at appropriate recycling or repurposing sites. Good says, "I think we all need to walk in each other's shoes more. I gained a huge appreciation for general contractors as a result of this." This latest project, however, is just a small snapshot of Good's much larger contribution, bringing sustainability to life, and making it part of every conversation. His portfolio of projects offers stunning examples of how environmental empathy and a responsible work can coexist. As mentor, inspiration, and sometimes student to his staff and family, he defers to them, when

it comes to taking credit for his success.

His staff includes four architects, an interior designer and an office manager. "We're a team," he replies. "We wouldn't be where we are without their shared values and skills." GB

Team of heroes. Nathan Good, who heads Nathan Good Architects, may have gained a reputation as a champion of sustainability, but he stresses that he's only as good as his staff. From left to right: Meghan Laro (office manager), Forrest Good AIA (architect), Lydia Peters AIA (architect), Nathan Good FAIA (architect), Emily Doerfler (interior designer) and John Carriere (architect). Learn more at www.nathangoodarchitects.com

# Green Guru

For GB's inaugural champion of enviro-friendliness, education is the key to great green building.

### **BY ALAN NADITZ**

N THE PAST DECADE, Nathan Good has overseen planning of eight LEED, two Passive House and more than 14 Earth Advantage-certified homes. His goal-and that of his company, Nathan Good Architects in Salem, Ore.--is to provide homeowners with a sustainably equipped dwelling that that minimizes resource use.

WINNER:

Salem, Oregon

Bar to New Heights

Nathan Good, Architect

Raising the Eco-Responsibility

Small wonder, then, that after more than two decades in the industry, Good and his wife, April Waters, decided to take the leap themselves and have a home built with the types of green attributes that educate one of the biggest parts of their lives.

"[At the time] I'd been advocating for green building for over 20 years," says Good, a two-time Green Builder Home of the Year winner. "How could I not live in a green home, myself?"

Good says "I'm a sucker for anytime anyone asks me to give a



Sustainable skylines. Nathan Good Architects' designs emphasize key green elements that homeowners are after, such as natural lighting, solar power and reclaimed wood siding

### **GREEN BUILDER** Sustainability **GREEN INNOVATIONS OF THE YEAR**

# **GREEN INNOVATIONS OF THE YEAR** Sustainability Awards 2019

### **BY GREEN BUILDER STAFF**

They say that necessity is the mother of invention. That's held true in the green building industry, as contractors, manufacturers and retailers consistently innovate products designed to solve issues such as energy waste, regulatory compliance and indoor air guality. Here are 12 products chosen by Green Builder for outstanding and innovative design and performance.

### GRAND WINNER: EcoSmart Solution



### **GEOTHERMAL ENERGY SYSTEM**

COSMART SOLUTION OFFERS an answer to a longstanding question: "How do you build affordable, sustainable homes and communities?" The answer is found in Whisper Valley in Austin, Texas. Although geothermal energy is considered a very practical and effective way to naturally heat and cool a home, upfront infrastructure costs make the system cost prohibitive. Many homebuyers are priced out of their ability to participate in sustainable living.

EcoSmart Solution uses an innovative and community-wide GeoGrid to combine geothermal heating and cooling into a system that cuts a home's power consumption by 60 to 70 percent. The process utilizes a loop field that enables geothermal-generated power to be shared among multiple residences, keeping costs down for owners. It's installed at the start of development as a part of the community's infrastructure, making it possible for builders to add on homes to the system as they are built-instead of installing a separate system for each unit—dropping project development costs dramatically.

High-efficiency Bosch appliances, Google Nest smart home and photovoltaics generate the additional energy needed to power the home. Pairing EcoSmart's infrastructure and responsible energy behavior has resulted in Whisper Valley homes being priced from the low \$200,000s to the low \$400,000s—a much more affordable price range for all potential buyers. For more information: http://ecosmartsolution.com/



Playing the (air loop) field. EcoSmart Solution's GeoGrid geothermal heating and cooling network links multiple houses to one system, drastically cutting expenses for everyone.

### MART PLUMBING:



### **VORMAX PLUS SELF-CLEANING TOILET**

HE VORMAX PLUS toilet from American Standard is a high-efficiency, self-cleaning toilet that has earned WaterSense-certification from the U.S. Environmental Protection Agency (EPA) for providing high performance while using 20 percent less water than traditional 1.6 gallons per flush (gpf) toilets. It has achieved the highest bulk removal score on the Maximum Performance (MaP) test, an independent report of toilet performance, successfully flushing 1,000 grams (2.2 pounds) using 1.28 gpf. VorMax Plus FreshInfuser cleaner, hidden in an easy-to-access compartment in the seat, is released with each flush to freshen and clean the bowl, and prevent staining and hard water build up.

For more information: https://bit.ly/2TFOPge

### **BATH VENTILATION:** Delta Electronics

### **BREEZINTEGRITY VENTILATION SYSTEM**

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### **AIR SEALING:** Aeroseal

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### For more information: https://aerobarrier.net



### flat panel light fixture with ventilation, the Breez-Integrity ITG100ELED complements other edge-lit LED lighting in the home, while the 100-CFM exhaust fan maintains proper indoor air quality in bathrooms up to 100 square feet. It's also UL listed for installation over the tub or shower when installed with a GFCI-protected branch circuit. For more information: www.deltabreez.com/ITG100ELED.php

### **LEAK DETECTION: Uponor**

### PHYN PLUS INTELLIGENT WATER MONITOR

PONOR'S PHYN PLUS Smart Water Assistant + Shutoff is an intelligent water monitor that attaches to the main water line of homes. Utilizing Phyn's patented technology, including machine learning and artificial intelligence (AI), Phyn Plus measures tiny changes in pressure-240 times a second-to detect plumbing issues in real time. It can remotely shut off the main water supply to prevent costly damage. Phyn Plus monitors a home's entire plumbing system and provides homeowners unprecedented insight into how they use water.



**GREEN BUILDER** 

In addition to being a safe and reliable leak detection solution, the device helps eliminate water waste.

For more information: www.phyn.com

### **LEAK DETECTION:** Flo Technologies

### WATER MONITORING AND LEAK PROTECTION SYSTEM

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### **GREEN BUILDER** Sustainability Awards 2019

# **GREEN INNOVATIONS OF THE YEAR**

# **GREEN INNOVATIONS OF THE YEAR** Sustainability Awards 2019

### HVAC PERFORMANCE: Lennox



### VARIABLE SPEED ULTRA LOW NOX GAS FURNACE

HE LENNOX SL297NV Variable Speed Ultra Low NOx Gas Furnace helps combat the health and environmental problems that NOx gas creates, and some of the installation problems faced by builders. The unit meets those requirements where local governments and municipalities have lowered the NOx emission limits for natural-gas-fired, fan-type residential central furnaces, such as those within certain parts of California. The SL297NV helps make the air cleaner, and also provides environmentally friendly home heating options for homeowners who want an earth-friendly, quiet and efficient product and are looking to avoid a fine for not being compliant with the new regulations.

For more information: https://bit.ly/2y0Ta94

### **HEAT PUMP TECHNOLOGY: LG Electronics**

### SINGLE-PHASE VRF HEAT RECOVERY SYSTEM

S THE U.S. market's first singlephase variable refrigerant flow (VRF) five-ton heat recovery system, LG's MULTI V S is a compact, heat recovery unit designed to provide excellent energy efficiency, and the versatility of simultaneous heating and cooling up to 12 zones. With a smaller capacity (60,000 Btu/h cooling; 64,000 Btu/h heating), compact design and single-phase power, the MULTI V S helps builders increase energy efficiency and lower energy costs without sacrificing comfort. MULTI V S also features LG's high-efficiency inverter scroll compressor, allowing the unit to provide cooling capabilities in ambient temperatures up to 122 °F and heating operation down to minus 13 °F. For more information: https://bit.ly/2CiwjTY



### ZONING EFFICIENCY: Mitsubishi Electric Trane HVAC US



### **MLZ ONE-WAY CEILING CASSETTE**

HE MLZ ONE-WAY Ceiling Cassette is an indoor unit designed to help homeowners achieve comfort and optimize energy usage through zoning. With a sleek, narrowbody design that fits between standard 16-inch joists, the MLZ enables easy creation of zones for comfort and usage needs, providing energy savings for existing homes and new construction. Utilizing an inverter-driven compressor, the MLZ provides the space with the exact amount of energy to cool or heat an area without turning the system on and off. The unit also syncs to Mitsubishi's kumo cloud app and web service, which intelligently manages the *MLZ* to customize airflow direction and temperature. For more information: https://bit.ly/2SMzOsV

### FLEXIBLE CODE COMPLIANCE: Panasonic EcoSolutions

### WHISPERFRESH SELECT FRESH AIR SUPPLY FAN

ANASONIC'S WHISPERFRESH SELECT supply fan offers builders, remodelers and homeowners a filtered fresh air solution for tightly built, energy-efficient homes. The fan can operate as a standalone fresh air supply solution or can be paired with Panasonic's multi-speed exhaust fans for a whole-house indoor air quality (IAQ) solution, bringing fresh, filtered air from outside into the home, and exhausting stale, moist, polluted air out of the home to create balanced ventilation. The *WhisperFresh Select* can be used to comply with many green building standards, including LEED, ASHRAE 62.2 and California's Title 24. The solution is also recognized as 2018 Energy Star Most Efficient.

### For more information: https://bit.ly/2D78cJF



### **EV-CHARGING SINGLE-PHASE INVERTER**

HIS INTEGRATED SOLUTION advances development of holistic smart energy homes. Installers and builders can costand time-effectively design and build homes that embrace smart energy production and consumption. As an example, the EV-Charging Single-Phase Inverter reduces the workload and costs of separately installing two standalone products-an electric vehicle (EV) charger and solar inverter. This saves space on the main distribution panel and eliminates possible panel upgrades. SolarEdge provides its inverter with an EV-ready option so that is future-ready for new EV purchases or replacement. SolarEdge's monitoring app also allows for remote charging or prescheduling. For more information: https://bit.ly/2D7M9m5



**GREEN BUILDER** 

### STRUCTURAL INGENUITY: TStud

### **TSTUD STRUCTURAL FRAMING SYSTEM**

HE TSTUD SOLVES the No. 1 nemesis of the construction industry: How to "cost-effectively" minimize the transfer of outdoor climatic heat or cold from affecting the interior of a structure's ambient room temperature. It is a thermally broken, insulated wall stud assembly for use in exterior walls and in party walls. A built-in foam core gives the *Tstud* three times the insulation of a conventional wood stud. The Tstud is fully International Building Code compliant for all of North America. It is available for use in all five Hurricane Zones and all six Seismic Zones. For more information: www.tstud.com



### **GREEN BUILDER** Sustainability Awards 2019 URBAN SUSTAINABILITY PROGRAMS

# URBAN SUSTAINABILITY PROGRAMS Awards 2019

### **BY GREEN BUILDER STAFF**

### Builders aren't the only ones working sustainable policies into their everyday activities.

Cities are also taking part, with creative approaches to eco-challenges ranging from greenhouse gas reduction to building code enforcement. Here are three cities—one small, one mid-sized, one large—that have taken steps to promote sustainability with exceptional organization and passion.

### **Small Municipality Winner: Wellington, Fla.**

### WELLINGTON ENVIRONMENTAL PRESERVE

HE VILLAGE OF WELLINGTON is deeply committed to improving sustainability and quality of life for its residents. In 2012 and 2017, Wellington obtained a Gold Standard certification from the Florida Green Building Coalition for its sustainability practices. Since then, sustainability efforts have only increased.

A highlight is the Wellington Environmental Preserve, which is a byproduct of the cooperative efforts among federal, state, regional and local agencies to restore America's Everglades.

The preserve, a 365-acre rainwater storage area, was built through a partnership between the Village of Wellington and the South Florida Water Management District (SFWMD). It received the "Project of the Year" award from the Palm Beach County Chapter of the American Society of Civil Engineers. The preserve is also used to naturally cleanse storm water runoff of phosphorus from the southern portion of Wellington, through its two-plus miles of combined wetland/marsh areas, littoral shelves and deep water sediment traps prior to its discharge.

The preserve also includes nature trails, seven designated learning



A green guardian. The Wellington Environmental Preserve protects the Everglades, animal life and the public by naturally cleansing storm water runoff.



Walk of life. Nature trails, learning centers and a six-story observation tower give visitors a wide view of Mother Nature.

centers, a six-story observation tower and a 3.6-mile perimeter trail. Segway tours are offered, and many groups meet to use the trail as a running destination. It is considered a top South Florida destination for bird watching and photography.

"The Wellington Environmental Preserve is a great example of a project that can benefit the environment while providing a valued amenity for the residents," says Branden Miller, a planner with the Village of Wellington's Planning and Zoning Department. "It is also a great example of Wellington's commitment to sustainability and improving quality of life for its residents."

Other efforts by the city follow that same philosophy. All governmental buildings constructed since 2012 have been LEED certified, and numerous services and practices have been focused on sustainability efforts. Some of these practices include free electric car-charging stations at municipal-owned facilities, water reclamation for irrigation—which saved more than 200 million gallons of water last year-and an electric vehicle fleet. GB

### **GREEN WORKS ORLANDO**

INCE 2007, THE CITY OF ORLANDO has been working to transform into the most environmentally friendly, socially inclusive and economically vibrant city in America. Through Mayor Buddy Dyer's Office of Sustainability & Resilience, also known as Green Works Orlando (GWO), the city has become nationally and internationally known for innovative policies and programs that work to achieve the triplebottom line of sustainability: improve the quality of life and wellbeing of people, protect the planet and ensure prosperity for all.

The GWO office focuses on advancing sustainability and resilience in seven key areas: clean energy, green buildings, local food systems, solid waste, livability, transportation and water resources. Through this framework, GWO has successfully undertaken numerous green actions, including:

- · Earth-friendlier transportation. Under GWO's watch, Orlando has expanded its Downtown LYMMO circulator busline, completed the SunRail commuter rail service, launched car sharing with bike sharing, and converted hundreds of fleet vehicles to electric, hybrid or compressed natural gas.
- Added energy-efficient buildings and homes. In the past decade, the city has performed energy efficiency retrofits to 1,200 houses, completed 10 LEED-certified municipal buildings, with two more under construction, and completed or approved \$19 million in energy efficiency investments to municipal buildings.
- Improved community sustainability, such as through the planting of 10,000 trees and establishment of five community gardens, and increasing recycling collection by 35 percent.
- Brought farmers and homeowners together. In 2014, the city launched its Fleet Farm program, a tie-in to a new ordinance that allows farming on up to 60 percent of a resident's front yard. Homeowners get 5 percent to 10 percent of the harvest, and the rest is sold to local restaurants and farmers markets. According to Orlando Director of Sustainability Chris Castro, the actions made perfect sense: Lawns are one of the largest sources of pollution in the U.S. due to all the chemical fertilizers and pesticides used to maintain them, and they result in 800 million gallons of gasoline being used for mowing. Plus, unused public lands in lower-income areas have been turned over to neighboring residents, who share the harvests for food and small-community profits.
- Planned for a green future. The city has adopted the 2012 Municipal Operations Sustainability Plan and the 2013 Green Works Orlando Community Action Plan, with efforts now underway to implement 2018 plan updates. Both have set guidelines and sustainability goals as the city works toward aligning itself with the Paris Climate Agreement for Cities, which calls for a 90 percent cut in carbon emissions from 2007 levels by 2050. The efforts are gaining attention. In 2017, Orlando was recognized as the nation's most energy-improved city, and ranked 20th for its

### Mid-Sized Municipality Winner: Orlando, Fla.



**GREEN BUILDER** 

Grow their own way. Community gardens and other pro-farming efforts have made Orlando a greener and more sustainably productive city.



**'Curbed' enthusiasm.** City recycling collection efforts have increased by 35 percent under Green Works Orlando's watch.

energy efficiency policy and programs on the American Council for an Energy Efficient Economy (ACEEE) City Scorecard.

Castro says it's all a matter of prioritizing as to what's most important. "We are working to make sustainability a culture of innovation in Orlando, and positioning us to become a model city in the 21st century," he notes. "But the ultimate beneficiaries of our work will be our children and grandchildren. Working together, we can make a cleaner, greener and better Orlando for generations to come." GB

### **GREEN BUILDER** Sustainability Awards 2019 URBAN SUSTAINABILITY PROGRAMS

### Large Municipality Winner: New York City

### NEW YORK CITY DEPARTMENT OF BUILDINGS

REENHOUSE GAS EMISSIONS are a huge threat to the planet's health, and New York City unintentionally does its share because of its massive building stock: CityLab places the number at 1.1 million buildings, all of which emit CO<sub>2</sub>. City officials estimate that 75 percent of its greenhouse gas comes from those structures.

The New York City Department of Buildings (DOB) is tasked with cutting that number down. Since 2013, DOB's team of plan examiners has worked to enforce the city's efforts toward carbon emissions reduction.

"Before 2013, the energy code compliance program was in its infancy," says Gina Bocra, the city's chief sustainability officer. "[The examiners] were the only line of defense when it came to energy consumption in our buildings."

In the past half decade, the DOB has implemented numerous programs designed to help the city make program on its climate change goals. Those efforts include:

- Full enforcement of the energy code prior to approval for new buildingssomething few cities actually do, according to Bocra. "Our plan examiners have raised awareness and understanding the energy code among applicants, resulting in thousands of buildings in the city being compliant with the code, [and] saving New Yorkers energy," she says. "[This] means dollars in their pockets, as well as securing a better future for all New Yorkers by working to reduce the impacts of climate change."
- Creation of the Local Law 87 (LL87) Enforcement Unit. This program took an unfunded mandate to a functional enforcement program that has reviewed the energy efficiency reports for thousands of the city's largest buildings, Bocra notes. To date, it is estimated that the program has helped cut energy use in these structures by up to 6 percent, a total that over time can double, based on national averages, Bocra says.
- Establishing the Local Law 84 (LL84) Enforcement Unit. DOB established a dedicated unit to this program, which requires owners of large buildings to report their annual energy usage and water



Air purity planning. Every day, Department of Buildings plan examiners work to enforce New York City's efforts toward carbon emissions reduction.



The Big Green Apple? Three-quarters of New York City's greenhouse gas comes from its estimated 1.1 million buildings—an emissions total the Department of Buildings is working to reduce



A watchful eye. New York City Department of Buildings code enforcement officers have helped cut the city's  $CO_2$  emissions by six percent since 2013.

consumption to the city. "Since the LL84 team was brought on board, their support has resulted in an 80 percent reduction in noncompliance," Bocra says. "[This] ultimately means better energy data transparency for building owners, helping them better understand how one building's energy performance compares to another's."

• Development of the Energy Code Inspections (ECI) team. In New York City, owners are obligated to perform energy code progress inspections on construction projects, but it often does happen, Bocra notes. Changes are made in the field, and many builders do not know how to keep up with the code. ECI now makes random inspections at construction sites, increasing the awareness of the energy code among builders and trades, and "ultimately is ensuring that what was approved on the drawings is what is happening on the site."

Whereas most municipalities do not actively enforce such codes or laws, the New York City DOB is setting the pace on regulation of energy usage, according to Bocra. "Each of these programs has taken innovation to get it off the ground [and] to create the procedures and resources, with the team using ingenuity to adapt and apply what they could learn from other units at DOB to these new programs," she says. "The team has overcome the challenges in creating new programs and moving them to successful operations through collaboration, teamwork, dedication and passion." GB



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# **11TH ANNUAL**

# Green Home of the Year Awards SOMETIMES LESS IS MORE.

That's how judges summed up several of the winning projects in this year's Green Home of the Year Awards. Many of this year's entrants have embraced the Tiny Home concept and found a way to be small yet stylish and a showcase to sustainability. Our expert panel of judges evaluated projects in terms of overall sustainability, resilience, synergy with the environment and surrounding neighborhood, affordability, creativity and the depth of science employed. Here are their choices for the eight most exemplary and imaginative green homes.



design firm known for interiors that are innovative, sustainable and healthy. Cooke founded Wellness Within Your Walls (WWYW), a program designed to create new standards for non-toxic, low-impact interiors, including construction techniques, building practices, home furnishings and textiles. She is currently on the National Association of Home Builders Green and Sustainable Committee and Global Opportunities Board.

passion for residential architecture is realized through the design of sustainable custom home and multi-family buildings. His wealth of experience in retail architecture particularly in South Florida, provides an improved shopping experience for the modern shopper. A passionate advocate for green building, McGee helped to found the first local chapters of the U.S. Green Building Council (USGBC) in New Mexico and Palm Beach. Fla. He is regularly asked to present at the annual Greenbuild conference.

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### **THE JUDGES**

### Stace McGee's



Bill Roth has beer involved in the construction industry in New Mexico since 1975, when he arrived in Santa Fe and went to work

making adobe bricks for \$0.10 each. His company, Modern Design+Construction, Inc., specializes in small- to mediumsized modern homes that are built to the highest green building standards. Roth was part of the team that developed the Water Efficiency Rating Score (WERS) protocol for the homebuilding industry.



Mark Sapiro has established a reputation for superior custom home building and consulting in the Los Angeles and adjacent areas.

After four decades of building the established Mark Sapiro Professional Building Services (MSPBS) and Structure Home building firms, he is currently focusing on owners representative and expert witness work. He is a former senior vice president of construction operations for Braemar Homes. Sapiro is a licensed general contractor with a degree in Construction Managementt

## For this year's champion project, it's a case of location, location, location. **BY ALAN NADITZ**

Jason Offutt of The Shelter Studio in Bend, Ore. who built the structure.

NGIONE BEBERDER



Y THE TIME Gretchen Rowe decided she wanted a green home, she had all the details worked out. This made building it easier—yet highly challenging, according to designer

Rowe and her husband, Rodney Toogood, had selected a lot along the Deschutes River as the site of their new home, and had a specific set of parameters in mind for anyone

### **FROM THE JUDGES**

"The design team did a spectacular job with placement of the home on the lot, window placement, passive design and use of materials. There are many 'Old School' lessons complemented by new technology that make this home feel truly authentic."

Ample airway.

ily circulating whe

ıbishi mini-split heat

ot or cold clean air

### In the spotlight.

Halo LEDs in the ceiling supply bright but lowenergy consuming ghting.

### A higher purpose.

Ceilings throughout the

### ounds good

lensity, tripleass and lass doors act as ernal environment ound control

### Earth-friendly flooring.

The house features a selection of wood, stone and naturally sourced abrics and fibers in and on top of ts floors

"We were in the market for a waterfront," Rowe says. "The lot was something we walked by for six months before we asked the neighbors, who were doing a major remodel, if they would ever be interested in splitting the lot."

As it turned out, the property owners were considering expanding their garage, and splitting the lot would make that possible. That put the parcel in Rowe and Toogood's price range.

### **A LOCATION OUANDARY**

Because of its elevation-and Rowe's desire to be as green as possible—any home that went on the location would need to make best use of the sun. "They approached us to develop a modern designed home to work with the site, the views and street access," Offutt says. "[And meet] the goal of net-zero home design."

Bend's higher latitude would make that difficult, Offutt notes. "In our climate and latitude, the sun is encouraged into structures during the day and typically diminished in the afternoon, to not overheat homes in the summer, unless there is a view to the west," he says.

So, the home was designed to where the long axis of the home was exposed to the sun from early morning thru midday, and also late afternoon, while also not limiting the views to the river on the structure's west side. "The river actually runs through the backyard," Offutt says. "Keeping the view intact was a big deal."

Other parts of the home also were designed with this goal in mind. The upper-level spaces—including an exercise room and master bedroom—are oriented to the north, to not overheat during the day, while retaining their views of the river.

The sun was contained in other ways. At the main level, the kitchen, dining and living area are oriented to obtain passive solar gain during the day. Sun shades were added to help block the sun externally for western windows, without blocking the river view. Even the stair core is located to obtain passive solar gain throughout the day, using the sun to illuminate the stairs and halls.

### **POWER PACKED**

One of Rowe's other "must haves" was energy efficiency. "We wanted to make it as environmentally friendly as possible," she says. "We wanted to have an energy-efficient house that used as few resources as possible, produced as little waste as possible, used sustainable, renewable materials, and still stayed within our budget."

Energy-saving efforts are on display throughout the house: LED lighting, Energy Star-certified appliances, premium heating, ventilation and air conditioning (HVAC) venting, triple pane windows and insulation. Lots of insulation.

"We had a few weeks of delay in the building process that allowed me to go over every seam of the structure and add sealant where needed, look for any gaps, and stuff insulation in around window and door frames," Rowe says. She jokingly adds that she "obsessed over it for a bit while waiting for [subcontractors]."

There are high insulation ratings everywhere: R-38 behind the tub and shower, R-39 for exterior walls and subfloor, R-25 batts in rim joists, R-58 in vaulted ceilings, R-50 in attic spaces, R-21 in exterior walls of the garage, R-30 in the garage ceiling, and R-9.4 at the headers of the exterior doors and windows.



The exterior walls feature staggered studs at 10 inches thick to offer the best R-value, according to Offutt. On the metal roof, LG Solar *LG 305 NeON* panels provide necessary full power to the house, when the sun is shining.

The final result is a home that met Rowe and Toogood's energy goals—the Energy Trust of Oregon gave the house an Energy Performance Score of 8 out of 10, noting that is complements adjacent homes and the overall neighborhood, according to Offutt.

"Throughout the summer, their power bills have only been about nine dollars a month," Offutt says. "During the winter the power bills have been less than predicted—which was under \$100 monthly, and that's when one of the ductless heat pumps didn't work. [Now] we expect an even more-favorable reading."

### A WAY WITH WOOD

Rowe and Toogood also desired exterior materials that complement the northwest material palette, and were as low-maintenance as possible. James Hardie fiber cement products were used for siding, and northwest Douglas fir elements were brought in as accents, with a deep staining and sealant to preserve from sun exposure.

In addition, the home's ceiling consists of "rediscovered" redwood—wood passed over as scrap when the area was first logged, later reclaimed and rescued from the forest floor. "I'm a believer in conserving resources," Rowe notes.

Rowe, who stepped in as the general contractor when he stepped back due to personal matters, came away with a new perspective on home construction. "I had to really watch the details during the building process," she says. "Being that I have never been a foreman on a building site before, I had to 'pick my battles' and was not able to get everything done the way I had chosen after much research, but it was mostly just little things that were challenging...[such as] a drafty exhaust fan in the laundry room, more outlets in the garage and an outlet or two in the master closet. [But if] those are the only things that come up—not bad!"

Offutt can agree. "One of the things I love about my job is the ability to draw something up, and a year later I'm walking through it, all of it real," he says. "That, and seeing how happy people are with what I've done." **GB** 

### **Key Components**

ALTERNATIVE BUILDING SYSTEMS: 10-inch-thick staggered stud walls

APPLIANCES: Bosch 30-inch induction range, 500 Series pull out hood, 800 Series dishwasher, four-door refrigerator

BUILDING ENVELOPE: Increased R-value at wall framing, heel heights to roof trusses, foam insulation at vaulted areas, increased floor insulation, low blower door test (ACH= 2.0)

**CABINETS, SHELVES, MILLWORK:** Formaldehyde-free millwork

**CEILING:** "Rediscovered" reclaimed redwood from **Anthology Woods** in Ashland, Ore., **TimberPro** clear UV treatment before install

COUNTERTOPS: Pental quartz

**DECKS: Trex** patios with pavers; **TimberTech** decking

DOORS: Therma-Tru Smooth Star in garage; Therma-Tru Pulse Linea fiberglass doors in entryway; ProVia Heritage 460 French doors in master bedroom; Alpen 625 series quadsliding glass doors

DRYWALL: CertainTeed Easi-Lite lightweight drywall with Hamilton Smooth Set Lite, Beadex Lite allpurpose (red dot)

EXTERIOR FINISHES: Lowmaintenance James Hardie products FIREPLACE: Regency U900E gas fireplace

FLOORING: Pasha Intermission Basalt stone floor, Maple flooring, Marmoleum bath, Godfrey Hirst

Brookhaven II wool carpet upstairs GARAGE DOORS: Designer; Wayne

Dalton 8300 steel HOT WATER: Bradford White Energy Star-rated 50-gallon heat pump HVAC/DUCTS: Mitsubishi mini-split heat pump

INSULATION: Knauf EcoBatt R-38 behind upstairs tub/shower, CertainTeed Optima for blown in blanket, Hanes *Insuloc* netting for exterior walls and subfloor, BASF

### **Project Stats**

NAME: Rowe Toogood, Bend, Ore. ARCHITECT/DESIGNER: The Shelter Studio BUILDER: Philip Chavez, Gretchen Rowe PHOTOGRAPHER: Ross Chandler/Chandler Photography

**34 GREEN BUILDER** January/February 2019

Spraytite closed cell spray foam, CertainTeed MemBrane vapor barrier and loose fill BIBS fiberglass in vaulted

LANDSCAPE: Low xeriscape xeric/ native mulch with timed irrigation LIGHTING: Halo LEDs LOCKS: Schlage Lisbon for all interior

ceilings

and exterior

stains and clear UV

in powder room

penetrations.

soffits

upstairs bath

TPD

PAINTS AND STAINS: Low-VOC Sherwin Williams Duration exterior and interior paints, TimberPro low-VOC

### PLUMBING/PLUMBING FIXTURES:

Low-gpm **Moen** Align in kitchen, **Hansgrohe** Raindance and Ecostat, and **DXV** REM sink faucets, **Delta** Vero

ROOF: GAF Tiger Paw underlayment, ASC metal building products SEALANTS: Low- to no-volatile organic compound (VOC) sealants: DAP DynaGrip, Dynaflex and ALEX Plus products for subfloor, deck, windows, doors; Touch 'n Seal spray foam insulation for electrical and HVAC

SIDING: James Hardie panel and plank with HomeGuard Housewrap; Tamlyn Xtreme Trim, LP SmartSide vented

SOLAR: LG Solar LG 305 NeON modules STRUCTURAL COMPONENTS: Roof trusses and wood framing TILE: Happy Floors Glaciar Wave white kitchen backsplash (Cifre ceramica), Glaciar Smooth for the master shower, Jazz Hive for powder room backsplash, Hex Steel Grey on master floor, Pennyrounds on shower floor

**TOILETS: Toto** Aquia, **American Standard** H2Optimum dual flush in

VENTILATION: Energy Star-rated ceiling fans: TroposAir, Haiku L, and Kischler; HRV: Lennox Healthy Climate Heat Recovery Ventilator HRV5-200-

WATER MANAGEMENT (INDOOR/ OUTDOOR): xeriscape WINDOWS, SKYLIGHTS, PATIO DOORS: Marvin Integrity Ultrex E2 and E3, Alpen Zenith 625 series for transoms



**Nothing unnatural here.** Cabinets throughout the house include fronts made of solid, formaldehyde-free Alder, a locally grown product.



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THE DESERT SHALL BLOOM: **SOLUTIONS FOR A VERDANT PLANET** 

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Brimming with vision and ingenuity, the agenda features global leaders including:

- A welcome video from Jeff Bridges. Academy-Award winning actor and climate activist (yes, 'The Dude'!)
- General Wesley Clark (ret.), four-star general, former Army Chief of Staff, Presidential advisor, and fervent climate action advocate
- **Bill Walton**, NBA All-Star icon and passionate sustainability enthusiast
- Susan Kucera, award-winning Director, Cinematographer, and Producer of eco-films including "Breath of Life" and "Living in the Future's Past" (co-produced with Jeff Bridges)
- Gwen Migita, Social Impact & Inclusion Vice President and Chief Sustainability Officer, Caesars Entertainment
- Ron Jones, Founder/President Green Builder Media and industry provocateur

**NEW THIS YEAR!** Green Builder Media will celebrate our annual Home of the Year Award winners, and our expanded Sustainability Award winners, at a festive dinner on February 17 at 6:00 p.m. at the exclusive Mr. Chow in Caesars Palace. Our renowned awards program recognizes the industry's most authentic, advanced, beautiful, sustainable projects and the professionals who design and construct them.

Space is strictly limited and by reservation only, so reserve your seat today! General admission for the Sustainability Symposium is \$350. **Tickets for the Sustainability** Awards gala are \$150.

### February 18, 2019 9:00 am - 5:30 pm

Artemus W. Ham Concert Hall University of Nevada Las Vegas Las Vegas, Nevada

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# Tie Stade Lie

Small, straightforward and near net zero, this tiny home easily takes the place of larger living quarters.

### **BY ALAN NADITZ AND GREEN BUILDER STAFF**

WNERS OF THE STRICKLAND RESIDENCE in Oak Harbor, Wash., may one day build their oversized dream home. Or maybe not: At the moment, the 784-square-foot, two-bedroom "guest quarters" more than meets their needs.

"The owners are enjoying the smaller home and the relaxed lifestyle that comes with it," says Ted Clifton, the project's builder and designer, and president of Clifton View Homes in Coupeville, Wash. "They're considering not ever building the 'main house,' or at

most, making it about the same size as this one." Number one on the "must-have" list was zero energy performance. For Clifton, that meant including structured insulated panels (SIPs)-Premier Building Systems Neopor 6-1/2-inches thick in the walls, 10-1/4 inches in the roof—for maximum performance. In general, the home was designed with SIPs in mind: The heights of walls, pitch of the roof, and spans of roof SIPs were all optimized for passive solar gains and active PV system exposure, Clifton notes.

7

### **FROM THE JUDGES**

"Exciting in as much as it is simple and clean, and what small homes should be. Not a Tesla Model S, but a Chevy **Bolt.** This is net zero for the rest of us."

### Strength in numbers.

Energy Star-rated appliances are installed throughout the home.

### **Completely floored**

Snap-together laminate flooring eliminates the need for VOC releasing glues.

### The brighter side.

All lights within the residence are energy-saving LEDs.

### Warm feeling. A Fujitsu single-head

ductless heat pump above the entry door easily heats the entire unit.

### **Key Components**

ALTERNATIVE BUILDING SYSTEMS: Structural Insulated Panels (SIPs) by Premier Building Systems

**APPLIANCES:** All appliances are Energy Star certified

AUTOMOTIVE (ELECTRIC CAR CHARGING, ETC.): 6.3-kW solar array.

BUILDING ENVELOPE: SIPs 6.5-inch wall and 10.25-inch roof panels: 4-inch (R-20) foam insulation under the entire floor slab.

CABINETS, SHELVES, MILLWORK: Standard

CAULKS AND SEALANTS: All zero-volatile organic compound (VOC) products

**COUNTERTOPS:** Granite DECKS: Concrete

DOORS AND HARDWARE: Codel, Masonite **DRYWALL:** Various

**ELECTRICAL:** All lighting is 100 percent LED. All appliances are Energy Star certified. A 6.3-kW solar array is installed. EXTERIOR FINISHES: All zero-VOC products

FLOORING: Laminate

Pump

GARAGE DOORS: CLOPAY HVAC/DUCTS: Fujitsu Ductless Heat

### **INSULATION:** Premier Building Systems

Neopor SIPs 6.5-inch wall and 10.25-inch roof panels; 4-inch (R-20) foam insulation under floor slab; 2-inch (R-10) perimeter insulation under the house

LANDSCAPING: 100 percent native species, conforming to Ebey's Prairie National Historical Reserve requirements. LIGHTING: All lighting is 100 percent LED

LOCKS: Schlage PAINTS AND STAINS: Sherwin-Williams. all non-VOC products

PLUMBING/PLUMBING FIXTURES: Kohler **RENEWABLE ENERGY SYSTEMS (SOLAR.** WIND. ETC.): A 6.3-kW solar array provides

power the house and electric car. ROOF: Nu-Ray metal clad SIPs; 10.25-inch

roof panels SIDING: James Hardie HardiPlank SOLAR: Itek panels, Itek inverter,

SolrenView data monitoring SPECIALTY PRODUCTS: SIPs

STRUCTURAL COMPONENTS: SIPs VENTILATION: Fantech, Panasonic WATER HEATING: Bradford White tankless water heater with 99.5 percent EF WEATHER BARRIER: Kimberly-Clark BLOCK-IT

WINDOWS, SKYLIGHTS, PATIO DOORS: Vinyltek Boreal 6000 triple-glazed windows, with U-values of 0.16 to 0.21



Cathedral ceilings give the tiny house a larger-than-life feel, but not a larger-thantolerable energy bill. Builders dropped an eight-foot ceiling over the bathroom, resulting in a large attic space suitable for air-handling equipment and extra storage space for the owners. A Fujitsu single-head ductless heat pump, located above the entry door in the great room, easily heats the entire unit, with the bedrooms remaining just a couple of degrees below the main living area.

Other temperature control aids include Vinyltek Boreal 6000 triple-glazed windows, with U-values ranging from 0.16 to 0.21, depending on the type and size of window. Also, 4-inch (R-20) foam insulation was used under the entire slab, and 2-inch (R-10) perimeter insulation isolates the earth under the house from the surrounding surface air temperatures.

The power-saving parade goes on: All lighting is 100 percent LED. All appliances are Energy Star certified. Passive solar was designed in, with the south-facing windows optimized for passive solar gains. The 6.3-kW Itek solar array provides power for the house, and charges an electric car for

Summer cooling is managed by the thermal mass slab, and generous roof overhangs limit the ability of the summer sun to penetrate the high-solar heat gain windows. The windows provide much of the required heating during the winter months. The owners sought out and purchased a recycled door package of Codel and Masonite products for all interior doors. One hundred percent of the Sherwin-Williams paint and adhesives used were zero-volatile organic compound (VOC) products. The landscaping was 100 percent native species, in keeping with the requirements of the Ebey's Prairie National Historical Reserve.

The result is a series of certifications that include Certified Energy Star, Indoor airPLUS, and U.S. Department of Energy Zero-Energy

Ready-and a HERS Index rating of -16. "That's pretty standard for us now," Clifton notes. "[Overall], this project is an outstanding example of how modern building materials and methods can combine with a very traditional design to produce exemplary performance results." GB

about 5,700 miles per year.



### **Project Stats**

NAME: Strickland Residence, Oak Harbor, Wash, ARCHITECT/DESIGNER: Zero-Energy Plans, LLC BUILDER: Clifton View Homes DEVELOPER: Clifton View Homes



# Sensible design and sustainability combine to revitalize a classic southern N.Y. structure.

### **BY ALAN NADITZ AND GREEN BUILDER STAFF**

HEN THE BLACK FAMILY went searching for a new home, they literally found what they were looking for inside a 1930s farmhouse in rural Katonah, N.Y. There was an old-time charm in the two-story, four-

bedroom, three-bath dwelling. But it simply wasn't big enough to accommodate a family of five.

That's where, according to homeowner Jason Black, the fun began. "We prepared ourselves for the concept of 'Tiny House Living,' as we reduced our family-of-five's footprint into just a few rooms," Black says. "But you can't prepare

yourself to do this within the context of an active construction site."

That's right: The Black family lived in the house while it was undergoing an expansion. "The challenges of living in boxes, with little to no personal space, and a kitchen consisting of no more than a table, hot plate and microwave are obvious," Black notes. "But it was the compounded effects of fending off construction dust in a home with no roof, doors or windows, and a thin blue tarp preventing complete exposure to the elements that made this experience truly memorable ... [There's] nothing like using mosquito nets at night while you sleep."



The owners took their personal and professional passion and expertise in architecture, construction and sustainability to create the high-performance home they wanted. Leveraging the skill and capabilities of its project architect and contractor, while pulling aspects from Passive House, LEED and Living Building Challenge, the home was able to simultaneously balance sustainability and the economics that is achievable for any home renovation.

Recognizing the need for heating and cooling comfort, builders installed 60 high-performance, Passive House-certified, triple-pane windows from Klearwall (with a U-value of 0.12). It wasn't as simple as it sounds. "Midway through construction, it was clear that the windows intended for our master bedroom would conflict with the adjacent kitchen and great room roof construction, obstructing key views from the master bedroom," Black says. "Changing the window sizes was not an option from a schedule and cost standpoint, requiring an emergency redesign of the new window layouts over 4th of July weekend. [We ended up]

reallocating more than 16 of the ordered windows to avoid additional field modifications of rough openings or slowdown of the contracting crew."

Existing siding was removed to install a comprehensive insulation package, not only between walls, but completely wrapping the entire home to the foundation footings with two inches of rigid insulation, and spray foam used at all roof and basement areas. This was topped with a high-performance air barrier and tape from SIGA to significantly reduce airflow by 65 percent, bringing it down to only 1,300 CFM.

With a tight envelope in place, new exterior façade and roof materials with long material lives (30-plus years) and low- or nomaintenance requirements created the modern farmhouse aesthetic the owners sought. White engineered board and batten siding, and an aluminum Energy Star-rated metal roofing positively impact heat gain/loss. Combined with programmable thermostats, heating oil use was reduced by 45 percent.

Reducing electricity use was also key. LED lighting anchored the efforts, combined with purchase of Energy Star appliances such as ceiling fans, kitchen and new central air system. A 6.2-kW photovoltaic solar roof system generates 75 percent of annual electric use on site. These conservation efforts also address water, with installation of new Niagara Conservation 0.9 gallons per flush (gpf) toilets, WaterSense faucets/shower heads, and Evolve shower valves. With reduced water use, the family also introduced a whole-home water filtration system by Aquasana to reduce contaminants.

Lastly, with recycling and composting bins designed into the new kitchen, generated waste was reduced and recycled, and reused as organic matter for a new backyard garden. Landscaping remained traditional, utilizing existing planting. "Anything my family has put in are native drought-tolerant plants," Black says. "No irrigation system was installed, and we do not use any lawn care from a fertilizer and treatment standpoint, to avoid use of chemicals." GB



### **Project Stats**

NAME: Black Residence, Katonah, N.Y. ARCHITECT/DESIGNER: Great Oak Studio Architecture BUILDER: Dynamite Contracting PHOTOGRAPHER Meredith Black

### FROM THE JUDGES

"Yes! A perfect example of an existing structure updated to current high-performance water and energy standards. Well thought out, with priorities in place."





### Organic Infill would be a challenge. But Dwell Development With a little bit of green founder and principal Anthony Maschmedt says it was business as usual. "We feel [infill] is the most creativity, new easily sustainable way to build," he says. "Existing homes are preserved and restored, the neighborhood and community stays consistent, and the new home blends in with old at this utilizes the existing infrastructure and blends into the area seamlessly." Seattle project.

### **BY ALAN NADITZ AND GREEN BUILDER STAFF**

ITH DWELL DEVELOPMENT'S Northwest Net Zero project, it was all about location. The four-bedroom, 2.5-bath house in Seattle's Columbia City was built on an infill lot with an existing home, sandwiched between older homes

in an established neighborhood. This meant care had to be taken to make sure that the new unit could be constructed to meet aesthetic and lot-size parameters, without standing out from its neighbors. For some builders, such a land-use component

www.greenbuildermedia.com

According to Dwell Interior Designer Abbey Maschmedt, making the latter come true is usually accomplished with appropriate siding materials and roof lines. With Northwest Net Zero, developers acquired 100-year-old reclaimed Eastern Oregon barn wood and applied it as the exterior cladding, in a herringbone pattern—"seamlessly weaving the patina of age with a shiny new, modern aesthetic," she says.

The team incorporated sustainably harvested red and white oak hardwood throughout the interior, mimicking the feeling of being in nature among the trees. With a combination of reclaimed wood and polished concrete floors, the interior of the home achieves a stylish yet organic look, the company notes.

### Sun roof.

Firestone thermoplastic polyolefin (TPO) and composition singles make up a roof that is also solar ready.

Virtuous coating

Outside paints, caulks and

sealants contain no volatile

organic compounds (VOCs) or

dded formaldehyde ingred

### Reclaimed textures.

Exterior cladding comes from 100-year-old Oregon barn woo

Planted

he home's

ith care.

dscape includes

all-local or reused

plants and bio-

retention planters to

catch all roof water.

drought-tolerant

ANTES

### **Key Components**

ALTERNATIVE BUILDING SYSTEMS: Airtight permeable fluid-applied air barrier APPLIANCES: Bosch

AUTOMOTIVE (ELECTRIC CAR CHARGING, ETC.): Standard EV charging station; net-meter solar PV prewire

BUILDING ENVELOPE: Enviro-Dri fluid-applied membrane with open rainscreen siding, 10-inch double 2-by-4 studded wall system with blownin cellulose bib and blow-back insulation.

CABINETS, SHELVES, MILLWORK: Abodian

**CAULKS AND SEALANTS:** No VOC, offgassing or added-formaldehyde ingredients

### COUNTERTOPS: Caesarstone

**DECKS: Zometek** recycled bamboo and paper deck tiles

DOORS AND HARDWARE: Medalion, Schlage

**EXTERIOR FINISHES:** 100-plus-year-old Eastern Oregon barn wood

**FLOORING:** Sustainably harvested oak from Montana

**HOME CONTROLS: Prewired for Kirio** Smart Home Automation System

HVAC/DUCTS: Mitsubishi 5-head Ductless Mini Split heating and cooling

INSULATION: Dense-packed bib and blown-in GreenFiber cellulose in all exterior walls; CertainTeed fiberglass for ceiling; rigid insulation over top of roof; interior walls, floors and stairs with Knauf EcoBatt insulation

**LANDSCAPING:** All local or reused droughttolerant plants and trees. Terrance exterior rear yard with organic gardens and flora

LIGHTING: Hudson Valley Mitzi Collection; Seattle Lighting; ELK Lighting

PAINTS AND STAINS: Sherwin-Williams PAVERS: Mutual materials

PLUMBING/PLUMBING FIXTURES: Grohe plumbing fixtures; Niagara 0.8-gpf toilets RENEWABLE ENERGY SYSTEMS (SOLAR, WIND,

ETC.): Prewired for solar ROOF: Firestone thermoplastic polyolefin (TPO)

and composition singles

**SIDING: Hardie** panels and 100-plus-year-old barn wood

**SPECIALTY PRODUCTS:** Kitchen wrapped in sustainably harvested quartersawn oak

VENTILATION: Honeywell HRV

WATER HEATING: Rheem Performance Platinum 65-gallon, 10-Year Hybrid High Efficiency Smart Tank Electric Water Heater

WATER MANAGEMENT (INDOOR/OUTDOOR): Bio-retention planters to catch all roof water. WINDOWS, SKYLIGHTS, PATIO DOORS: Prime triple-pane high-performance insulated windows and doors

OTHER: Drywall: Georgia-Pacific gypsum

Northwest Net Zero is net-zero-energy ready and features an innovative combination of green building techniques and systems. The forward-thinking passive design strategy includes a solarready rooftop, electric vehicle charging conduit, a heat recovery ventilation system and triple-glazed energy-efficient windows. The bathrooms feature designer-selected recycled content tile; Maiolica tile from Spain is used on the full-height kitchen backsplash and master bath. All bath and kitchen fixtures are WaterSense certified and can save up to 8,000 gallons of water per year. The home's airtight building envelope maintains indoor comfort and healthier air quality. Dwell Development also avoids volatile organic compound (VOC) paints or grout, so the home is free of toxic materials and full of healthy, fresh air, the company adds.

**Project Stats** 

PHOTOGRAPHER: Tucker English

NAME: Northwest Net Zero, Seattle, Wash.

BUILDER/DEVELOPER: Dwell Development

**ARCHITECT/DESIGNER:** First Lamp Architecture

Residents can lower their carbon footprint, thanks to the home's proximity to public transit—including Seattle's new Link Lightrail station—as well as local retail and a grocery store.

Not surprisingly, the house has been a hit with buyers, Anthony Maschmedt says. "All the homebuyers that toured the home in the few days it was on the market loved it. The one thing I heard the most was, 'When and where are we going to build another one of these awesome places?" **GB** 



### **FROM THE JUDGES**

"This home is a wonderful example of how small square footage can live in a big way. The materials used on the exterior and interior marry with nature. This home appears to be ideal for millennials looking to own their own property, have a lock-and-leave lifestyle and, most of all, have it be affordable."

### **LEVEL ONE FLOOR PLAN**





Here's a smart home that's safer, stylish and a whole lot of fun.

BY ALAN NADITZ AND GREEN BUILDER STAFF

> HEN The Mountain Life Companies decided to build green housing in Breckenridge, Colo., there was a key

element it knew it had to include: The homes had to be smart.

That's why the Victorian-style development, Epic on French also known as the Epic Homes of Breckenridge—is outfitted with integrated smart-home ecosystems designed to further the homes' efficiency and sustainability. According to Garratt Hasenstab, president of Mountain Life Companies and Epic on French's director of development, each smart home feature has been implemented to increase the occupants' health, safety and comfort.

04 Precious water. EPA WaterSense fixtures help Epic Homes achieve the highest degree of water conservation.

> For example, Nest thermostats learn about the occupants' comfort preferences, recognizing when people arrive home and turning on appropriate Wemo smart lighting at the right time for their safety and preferred ambience, while serving to improve energy efficiency. Nest also communicates with smart assistants such as Amazon's Alexa for voice command of the entire smart home system. Door locks and doorbells are connected to the Weave technology that Google and Nest developed. And, MotionSense kitchen faucets enable water flow with a wave of the hand, while smart fireplaces ensure just the right amount of fire and flash to suit owners.

> A Rachio smart irrigation system stays in tune with the prevailing weather, only irrigating the ecologically sensitive xeriscape gardens when rain is not in the forecast. It also monitors outdoor air quality to where if smoke is detected, Nest Protect tells Rachio to wet

### down the outdoors, to help mitigate fire spread around the home.

The homes are equipped with only EPA WaterSense-certified fixtures, ensuring that they are achieving the highest marks when it comes to water conservation. The devices save the typical homeowner about 500 gallons of water annually, according to Hasenstab.

There are other "must have" items in each home: A large number of windows, custom glass doors and stairwells allow abundant natural light throughout the household. Sustainably harvested and handscraped wide-plank hardwood is used on all floors. High ceilings, vaults and cathedral open spaces bring in air, light and warmth to every room.

The accolades have begun. The project is slated to earn LEED Platinum certification from the U.S. Green Building Council. The U.S. Environmental Protection Agency has already granted it Energy Star for Homes Certification, WaterSense New Home Certification and Advanced Lighting Certification. And in 2017, Epic on French received the Summit County Builders Association's Parade of Homes Sustainability Award.

Hasenstab says it's all due to the dedication of parties devoted to the green cause, including his business partner, Gregory Jordan, homebuilder Heritage Homes of Nebraska, and the environmental sustainability consulting firm Verdigris Group.

"We are thrilled for the honor and recognition of our efforts in building

to the highest standards of sustainability," he says. "The award also reminds us of our mission to serve as a leader and exemplar to our fellow industry participants, setting the bar as high as possible in order to reach new heights in sustainable development." GB

### **Project Stats**

NAME: Epic on French, Breckenridge, Colo. LANDSCAPE ARCHITECT: Norris Design BUILDER: Heritage Homes of Nebraska **DEVELOPER:** Mountain Life Companies PHOTOGRAPHER: Garratt Hasenstab

### **Key Components**

ALTERNATIVE BUILDING SYSTEMS: Off-site fabrication

APPLIANCES: Energy Star-rated kitchen appliances from Viking Professional BUILDING ENVELOPE: Closed cell spray foam insulation, 2-inch rigid insulation on the exterior of the

concrete foundation wall and slab CABINETS, SHELVES, MILLWORK: FSC-certified hardwood cabinets CAULKS AND SEALANTS: No-VOC

caulks and sealants used throughout home **COUNTERTOPS:** Granite

**DECKS: Trex** decks

DOORS AND HARDWARE: Bayer-built Acclimated Entry systems; Nature Series doors featuring UltraBlock ELECTRICAL: Neurio Home Energy Monitoring system and software

**EXTERIOR FINISHES:** James Hardie fiber-cement siding and no-VOC paint FIRE PROTECTION: Nest Protect smoke and CO detectors; Rachio Smart Irrigation system FIREPLACE: Kingsman direct vent gas

fireplace FLOORING: Engineered, carbonized bamboo flooring throughout GARAGE DOORS: Double-layer steel polystyrene 2-inch insulated (R-18) garage doors

HOME CONTROLS: Neurio Home Energy Monitoring system and software; Nest thermostats; Nest Protect smoke and CO detectors; Rachio Smart Irrigation system; MyQ smart-garage door system; MotionSense smart kitchen faucets: Wemo Smart Lighting

HVAC/DUCTS: Three zones of highperformance in-floor radiant heat

**INSULATION: Icynene** R-50 attic insulation; rigid foam board exterior insulation wrap; closed cell spray foam insulation

LANDSCAPING: Xeriscaping designed by Norris Design; Rachio Smart Wi-Fi Sprinkler Controller and Wireless Flow Mete

LIGHTING: Belkin-Wemo smart plugs and smart Wi-Fi light switches

LOCKS: Kwikset PAINTS AND STAINS: Sherwin-Williams Harmony line no-VOC paint

throughout PLUMBING/PLUMBING FIXTURES: All EPA WaterSense-certified faucets.

showers, dual-flush toilets: Delta plumbing

**RENEWABLE ENERGY SYSTEMS** (SOLAR, WIND, ETC.): Solar ready with conduit piped from main electrical panels to roof

**ROOF:** 7/8-inch corrugated, galvanized metal roofs by Corgen; composite shingles by CertainTeed STRUCTURAL COMPONENTS: Off-site

fabrication (13 modules) TILE: Venetian Classics (Italian porcelain)

**TOILETS:** American Standard

VENTILATION: Lennox Heat Recovery Ventilation System

WATER HEATING: Rheem RTGH-95DVLN 9.5-GPM Indoor Direct Vent Condensing Tankless Natural Gas Water Heater

WATER MANAGEMENT (INDOOR/ WEATHER BARRIER: SIGA Maivest: Tyvek

WINDOWS, SKYLIGHTS, PATIO **DOORS: Andersen** High-Performance Woodright, low-E windows throughout







### Good wood.

FSC-certified hardwood inets give an Old Wor ook while using sustainably ourced materials.

-0

### Natural flare.

ows ous win su v natura un dı a the da

> FROM THE JUDGES "Super efficient and great use of resources compared to the house's neighbors."

# This clever, compact Hawaiian bungalow has a tough side.

BY ALAN NADITZ AND GREEN BUILDER STAFF

Bannin

HEN A CLIENT ASKS DAVID SANDS to build a bamboo bungalow, it's a source of joy for him. Sands' company, Bamboo Living, specializes in housing made from the island's fastest-growing and most-durable plant. But one

Big Min

request carried more pride than the others. One of Sands' own employees wanted one of the stylish tiny shacks as a new home to celebrate her return to the Big Island of Hawaii after 12 years on the mainland.

The employee, Bamboo Living's sales manager, "wanted to live simply in a dwelling that mirrored the beauty and elegance of nature nestled within the tropical landscape of her youth," says Sands, the company's co-founder and chief architect. The simplicity comes in a tiny size: The bungalow is a mere 352 square feet on the inside, the smallest dwelling allowed by the local building department.



### FROM THE JUDGES

"Incredibly creative. This particular building speaks volumes as to why understanding the region's weather patterns and the materials that are available in the marketplace can produce affordable housing, and meet the needs of the specific target market. Sometimes less is more."

### Local and Renewable.

Bamboo makes up most major components in the bungalow, including the roof, woven bamboo ceiling bamboo railings and a bamboo ladder.

### Disaster ready.

The home's bamboo beams are designed not only to meet fire codes; but also to perform well in earthquakes and hurricanes.

### Minimal draw.

All lights are LED variety to help minimize power use.

### Carpet-free craftsmanship.

An earth-toned stained concrete floor adds to the natural beauty of the bungalow's interior.

### **Key Components**

ALTERNATIVE BUILDING SYSTEMS: Structural bamboo panel system

APPLIANCES: Samsung 30-inch, 5.8-cubic-feet Single Oven Gas Range; Vissani 9.9-cubic-foot Top Freezer Refrigerator

CAULKS AND SEALANTS: DAP Dynaflex 230 COUNTERTOPS: Mango wood kitchen countertops (epoxy finish) with Koa face

frames DECKS: Bamboo roof, woven bamboo ceiling, bamboo railings and bamboo pickets; stamped concrete with broadcast colors

**DOORS AND HARDWARE: Masonite; Kwikset** *Powerbolt* touchpad electronic deadbolt

ELECTRICAL: 6-kWh Blue lon lithium iron phosphate off-grid energy storage (Blue Planet Energy)

EXTERIOR FINISHES: Split bamboo siding FIRE PROTECTION: Bamboo poles meet requirements of Class A Fire Rating

**FLOORING:** Stained cream polish concrete **FURNITURE:** Hammock chairs that retract to the ceiling, built-in daybed, mobile kitchen island made from tropical hardwoods, bamboo ladder

### INSULATION: Reflectix

LANDSCAPING: Majority of lot left in its natural state with 'ōhi'a lehua trees, bamboo orchids and autograph trees; landscaping includes variety of tropical fruit trees

### LIGHTING: 100 percent LED

PAINTS AND STAINS: Sherwin-Williams Harmony Interior Acrylic Latex Paint (zero VOC formula). Cetol 23 Plus RE Wood Finish

PLUMBING/PLUMBING FIXTURES: Flojet 24-V DC with 2.1-gal pressure tank, American Standard stainless steel double-basin kitchen sink, Moen Adler Shower Faucet, Style Selections single sink vanity

**RENEWABLE ENERGY SYSTEMS (SOLAR, WIND, ETC.):** 6-kWh *Blue Ion* lithium iron phosphate off-grid energy storage; 8 **SolarWorld** 350-watt photovoltaic panels

ROOF: HPM corrugated metal roofing SPECIALTY PRODUCTS: Handmade copper rain chains

**STRUCTURAL COMPONENTS:** Structural bamboo scissor trusses, bamboo cross-brace shear wall panels, bamboo porch system with structural columns and beams

**VENTILATION:** Screened windows at roof peaks for natural ventilation

WATER HEATING: Takagi 140,000 BTU Propane Tankless Water Heater (T-KJr2-OS-P) WATER MANAGEMENT (INDOOR/OUTDOOR):

Rainwater catchment system (6,500 gal) WINDOWS, SKYLIGHTS, PATIO DOORS: Ply Gem windows and sliding glass door



### **FLOOR PLAN**

For almost a quarter century, Bamboo Living has made a name for itself by designing and building the first and only structures to use International Code Council (ICC-ES)-approved bamboo. The company calls bamboo construction "green building at its best," as it aids in the fight against climate change by saving trees and by removing carbon dioxide from the atmosphere, and bamboo stores Co2 faster than other trees, thanks to its fast growth rate.

The prefabricated bamboo elements include steel connectors at the joints, that are secured on site with a system of throughbolts. With this structural system, Bamboo Living buildings have withstood multiple hurricanes with winds up to 185 mph.

Nicknamed "The Tiny Bamboo Bungalow," the structure was built with a flying gable roofline, a high ceiling with exposed bamboo trusses, and a lanai with bamboo poles and pickets that blended into the outdoors. The bamboo components of the structure, which include the wall panels, roof structure and porch elements, were produced at Bamboo Living's factory in Vietnam. After being shipped to Hawaii, a construction crew of six assembled the bamboo home package in just one day.

The Tiny Bamboo Bungalow operates completely off-grid. A 6,500-gallon rainwater catchment tank stores and supplies the water. Eight photovoltaic panels capture the power of the sun, and the energy is stored in *Blue Ion* lithium iron phosphate batteries by Blue Planet Energy. The house is essentially off-grid ready, with propane-powered range and water heater, and no HVAC system. The home has a carbon-negative footprint, both in its construction phase as well as in its built state, generating more power than it consumes.

Meanwhile, the bungalow's owner says she felt personally inspired to add to the bamboo's beauty by including other natural materials such as mango and koa hardwoods for the kitchen countertops; choosing paint, tiles and a stained concrete floor with earthy hues; and displaying nature-centric art. She adds that she treasures the calm, tranquil space, and that the artisan-quality bamboo joinery "makes [me] feel like [I'm] living inside a handmade piece of furniture."

Sands believes bamboo could one day be the thing that takes the state of Hawaii carbon neutral. The plant's fast growth, he says, would easily make for a constant, easily accessed building material. **GB** 

### **Project Stats**

NAME: Tiny Bamboo Bungalow, Kea'au, Hawaii ARCHITECT/DESIGNER: Bamboo Living BUILDER: Bamboo Living PHOTOGRAPHER: Andrew Richard Hara

### This giant net-zero-ready community brings geothermal energy to a new high. **BY GREEN BUILDER STAFF**

heating costs by about 80 percent. construction industry standard of about a 60 rating.

III II

# Louce as a GREEN BUILDER

O UNDERSTAND THE SUCCESS of the Whisper Valley community in Austin, Texas, one has to look underground: The project's geothermal loop energy supply system, GeoGrid, reduces each home's energy consumption by 65 to 70 percent, cutting monthly

Combined with photovoltaic panels and products such as Nest thermostats and Bosch appliances, all 7,500 houses currently in or planned for Whisper Valley are net-zero capable and are consistently HERS rated in the teens and low 20s, far below the new

### FROM THE JUDGES

"This community doesn't just look to the technical side of sustainability. The team took the concept of health and wellness to a higher level. They presented health and wellness as an amenity. Highly marketable."

### Al Assistance.

Whisper Valley homes come equipped with smart thermostats, appliances and other voicecontrolled tech tools.

### Full sun.

Carefully sited solar panels supply 4 to 6 kilowatts of supplemental power to each

### Hidden energy treasure.

The community's revolutionary GeoGrid geothermal system runs throughout the neighborhood, supplying natural heat to all connected units.





According to EcoSmart Solution Founding Partner Axel Lerche, builders are excited about GeoGrid because it can be installed upfront—just like water, sewer and electric utility lines—driving down the cost by about 40 percent. It allows them to utilize planned home designs and then easily hook up to the loop system during construction.

GeoGrid's loop system features 5 miles of Rehau RAUGEO PEXa, vertical ground piping that enables the sharing of energy among homes throughout the block, keeping electrical costs down for everyone. Some homeowners' energy bills, for example, can be less than \$7 to \$60 per month, way below the \$300 usually seen from other homes in the region. Builders, meanwhile, can add their projects onto an existing line, instead of building a separate geothermal system for each home.

Lerche notes that EcoSmart's philosophy is built around affordable sustainability—a concept that took years to perfect for builders, partners, investors and residents.

Whisper Valley homes start in the low \$200,000s, making them affordable for buyers ranging from young couples to empty nesters.

### **Clean footing**.

A patented slab-on-grade foundation process (Tella Firma) avoids injection of chemicals into the soil below and near the homes It's ideal for unstable soils

### **Key Components**

ALTERNATIVE BUILDING SYSTEMS: GeoGrid EcoSmart Solution energy efficiency program

**APPLIANCES: Bosch** AUTOMOTIVE (ELECTRIC CAR CHARGING, ETC.): Prewired for Tesla EV charging system

HOME CONTROLS: Nest thermostats **INSULATION:** High-density spray foam in walls and attic spaces

LANDSCAPING: Tella Firma Foundations **LIGHTING:** LED fixtures throughout

PLUMBING/PLUMBING FIXTURES: Rehau RAUGEO PEXa vertical ground piping

SMART HOME: Google Fiber; Google Nest SOLAR: FRE Renewable Solutions: Canadian Solar modules and

Fronius inverters

STRUCTURAL COMPONENTS: Tella Firma Foundations slab-on-grade foundation **TELECOMMUNICATIONS: Google** Fiber internet service

WATER HEATING: Bosch Thermotechnology geothermal heat pumps

### **Project Stats**

NAME: Whisper Valley, Austin, Texas **ARCHITECT/DESIGNER:** Pacesetter Homes **BUILDER:** Pacesetter Homes **DEVELOPER:** Taurus Investment Holdings **PHOTOGRAPHER:** Courtesv of Pacesetter Homes

"Whisper Valley's sustainable lifestyle has attracted all types of homebuyers who want to reduce their carbon footprint and protect our environment," the company notes. "[And] Whisper Valley is having a major impact on residential real estate development by demonstrating that sustainable development appeals to today's homebuyer and is not only good for the environment, but it's a good investment."

Pacesetter Homes, Avi Homes, Buffington Homes, AHA Dream Homes and GFO Home are builders involved in the project. Construction will continue in phases for at least several more years.

EcoSmart has been recognized with an award for Innovative Energy Design at PCBC, a leading real estate conference in California, and has been a featured presentation nationally at the Urban Land Institute and internationally at EXPO Real, the largest European real estate investment conference. Whisper Valley was also named Best New Community in Austin by the Home Building Association of Austin, and has received major media coverage on its sustainable concept. GB



and energy efficiency."



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# Republic to the second When it comes to wasted energy, Panacea Retreat is a cure-all.

### **BY GREEN BUILDER STAFF**

Peak

HRIVE HOME BUILDERS' Panacea Retreat offers a picture-perfect example of how to optimize energy efficient at every level in a new home. The company's two-story, 3,200-square-foot dwelling in Denver carries a HERS score of 8, brought about by the presence of just about every efficiency feature that can be found in a home: 9.76 kW of solar, a Tesla *Powerwall*, Level 2 vehicle-charging station prewire, 9-1/2-inch thick R-40 double-stud walls, 14-inch raised heel height trusses, a 0.97 EF tankless water heater with a smart recirculating pump, an 18.9 SEER variable speed heat pump, a 98 percent efficient backup furnace, 100 percent LED lighting—and more.



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Fans of green buildings can also take a deep, happy breath: Innovations in clean indoor air include an active radon system, Panasonic ERV providing continuous fresh air throughout the home, a Carrier Performance Air Purifier, corn-based carpeting, and AirRenew drywall that absorbs and breaks down formaldehyde to ensure indoor air pollutants are reduced throughout the life of the home.

"The sole mission of Panacea was to inspire and raise the bar," says Seth Hart, senior designer for DTJ Design in Boulder, Colo., and Panacea's architect. "A zero-energy home offered at a production level makes a statement on its own but combined with a midcentury modern inspired design aesthetic; this home truly makes a statement."

Hart adds that the home delivers an eco-minded, luxury move up for buyers, offering a cost-effective, high-performance package of health, comfort, advanced technology, energy savings, quality and durability. These features save an owner about \$4,600 per year, compared with the costs of heating and cooling a typical, non-green home.

On top of all that, the Panacea Retreat was built with reclaimed beetle-kill lumber. The home acts as a showcase for all other LEED-certified homes in the area. "[With Panacea], we attempted to do something that we have never done: A production-built, mid-century elevation that truly pays homage to that style, and uses materials and technologies that we are not familiar with—i.e., prefinished siding and Tesla Powerwall," says Eric Sung, Thrive Home Builders' Director of Design. "We were able to incorporate everything we know in high performance into one collection."

Distribution of natural lighting was one challenge; the home's mid-century modern styling proved to be the ideal architectural solution to balance large expanses of glass with passive solar shading. Gable end windows at the front of the home now flood the master bathroom with light, without creating privacy concerns. And, the staircase is a celebrated feature, connecting all levels with an abundance of natural light.

All of these efforts have earned the home LEED certification, Zero Energy Ready Home status, and Energy Star and EPA Indoor airPLUS certifications by the U.S. Department of Energy. GB

### **Project Stats**

NAME: Panacea Retreat, Denver, Colo. **ARCHITECT/DESIGNER:** Valerian LLC BUILDER: Thrive Home Builders, Forest City Stapleton Inc. DEVELOPER: Forest City Stapleton Inc. PHOTOGRAPHER: Moss Photography



### **SECOND FLOOR PLAN**

**Good water works.** Panacea's bath and kitchen fixtures are all EPA WaterSense certified.

### **FROM THE JUDGES** "Great effort in applying all the green

elements and sustainability. This home also is reasonably priced, considering the level of masterful engineering."

### **On-site power**

The home's sun-powered features include Panasonic HIT 320 Watt Panels and a SolarEdge inverte

### **Reflective shingles.**

The Owens Corning Architectural Shingles on the roof provide long-lasting protection against excessive solar heat.

### **Key Components**

APPLIANCES: KitchenAid stainless steel appliances, including 36-inch 5-Burner Gas Cooktop, Double Upper Wall Oven with Even-Heat True Convection. Top Control Dishwasher with ProWash Cycle, Whirlpool microwave, and **Zephyr** Europa Anzio Chimney Pro Range Hood. AUTOMOTIVE (ELECTRIC CAR

CHARGING, ETC.): 220-volt outlet and prewire for future Level 2 charging station **BUILDING ENVELOPE:** Exterior double 2 x 4 walls with studs staggered at 24 inches with a 2-1/2-inch space CABINETS, SHELVES, MILLWORK: Kitchen Craft frameless, KCMA ESP certified

www.greenbuildermedia.com

**DOORS AND HARDWARE: Therma-Tru** 4-panel glass front door with Schlage keyless touch entry and Latitude interior satin nickel lever. Raised 5-panel smooth doors, Ultralite 6-inch base, 4-inch door casing, and Schlage Latitude satin nickel door levers FLOORING: Entry and Kitchen: Mohawk Engineered 5-inch Oak Harmon Manor. Baths and Laundry: Dal Slate Attaché 12-inch x 24-inch staggered tile flooring. Other locations: Mohawk SmartStrand Forever Clean carpet with Smart Cushion HOME CONTROLS: Carrier Infinity

### hature coloring.

The Retreat's exterior features Sherwin-Williams No-Volatile Organic Compounds (VOC) Harmony paints.

### lough turf.

Panacea's backyard includes xeriscaping and is WaterSense compliant

**CENTRAL VAC:** Optional **COUNTERTOPS:** Quartz countertops with 4-inch backsplash

controls

HVAC/DUCTS: Carrier Infinity 18 VS Heat Pump, Panasonic Intelli-Balance 100 ERV

**INSULATION:** Owens Corning L77 insulation

LANDSCAPING: Xeriscape, WaterSense compliant

LIGHTING: 100 percent LED Lights

PAINTS AND STAINS: Sherwin-Williams No-Volatile Organic Compounds (VOC) Harmony

PLUMBING/PLUMBING FIXTURES: 100 percent WaterSense faucets

**RENEWABLE ENERGY SYSTEMS** (SOLAR, WIND, ETC.): Panasonic HIT 320 Watt Panels, SolarEdge inverter **ROOF: Owens Corning** Architectural Shingles

### **STRUCTURAL COMPONENTS:**

Reclaimed beetle kill lumber used for studs

VENTILATION: Panasonic Intelli-Balance 100 FRV. Active Radon Control

WATER HEATING: Navien Tankless NPE 240A with Recirculating Pump

WATER MANAGEMENT (INDOOR/ OUTDOOR): Tyvek DrainWrap Water Resistive Barrier, Tyvek Flashing Tape and FlexTape at window and door penetrations. Quickflash at all small penetrations

WINDOW COVERINGS: N/A

WINDOWS, SKYLIGHTS, PATIO DOORS: Anderson Windows, U<0.25, low-E, NFRC certified

# **GREEN BUILDER® MEDIA** PRESENTS ALIGN <sup>BY</sup> Kasita

# RENDEZVOUS WITH REALITY

**THE ALIGN PROJECT** is a one-year demonstration project designed to challenge entrenched ideas about how we live in the U.S. and offer suggestions for how we can align our lifestyles with our changing socio-economic and environmental realities.

Whether we like it or not, the changing climate is demanding a sweeping overhaul of the way we live. Fortunately, advances in high-performance products and enabling technologies are providing viable solutions for enhanced efficiency, resiliency, sustainability, and connectivity.

The centerpiece of The Align Project is Kasita's small-footprint, net-zero, connected independent dwelling unit. The precision-engineered home takes



advantage of every square foot of space and comes with Kasita's smart home technology platform, which seamlessly integrates devices, appliances, lighting, and mechanical systems.

Recognizing that sustainable living extends beyond the home, The Align Project also focuses on revamping our cities, energy infrastructure, mobility solutions, and finances, highlighting sustainable choices that align with our moral compass to ensure a flourishing future.



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| For More<br>Information | Visit ww<br>or emai         | vw.gree<br>I Cati O'                 | enbuilde<br>Keefe a | rmedia.c<br>t cati.ok         | com/vis<br>ceefe@g | ion-house-t<br>greenbuilde | he-align-<br>rmedia.c | project<br>om |                                 |          |



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Learn more about our innovative products at: rockwool.com/modular







# **The Align Project: Align Your Mobility** When we consider daily travel, most of us keep our sights on the destination. What if we instead focused on the journey?

**BY JULIET GRABLE** 



we travel.

MILLENNIAL WITH A DOWNTOWN JOB zips by on a rented electric scooter to the nearest light rail station. A single woman with a flex schedule walks down to the co-working space a few blocks away. An older person with mobility issues consults with his doctor using *FaceTime*.

One of the questions we're exploring with The Align Project is how to thoughtfully overhaul our transit habits: Can we reduce the negative impacts of transportation, energy use and traffic among them, and improve our quality of life at the same time?

One way to approach this problem is to make the journey as important as the destination. This shift in perspective would affect everything: the type of car or truck we drive, which city we live in, the type of neighborhood we choose, how far we are willing to live from work or play, and with whom

For example, there's been a lot of hype about autonomous cars in recent years. By taking out the human error, such vehicles could improve the flow of traffic. However, other studies warn of negative consequences. The World Economic Forum modeled traffic [https://bit.ly/2MsFrsR] in downtown Boston and predicted a 5.5 percent spike in traffic as users chose autonomous vehicles over mass transit.

One problem with autonomous cars is that they are strictly destination based. And while they may be a great solution for some people some of the time, they're just one small part of a more human-centric transportation system.

The point is that there is no silver bullet—even a bullet train. It will take thoughtful, holistic planning. But first, we need to first consider where we are.



The Sharing Economy. Sharing cars, bikes and even scooters helps reduce the burden of ownership, making transportation more affordable and equitable.

### THE DRIVERS OF CHANGE

Transportation represents nearly 30 percent of our collective carbon footprint, eclipsed only by building energy use. What's more, we spend a lot of time in vehicles—nearly an hour per day [https://bit.ly/2LnPkMg], on average. And that time doesn't always add to our quality of life.

We like to think that our individual choices matter-and while they do, our collective behavior is shaped by an amalgam of incentives, policies and market realities. As we explored in an earlier installment of The Align Project, it's no coincidence that California, which sets quotas of electric vehicles (EVs) for carmakers, offers generous incentives for customers who choose EVs. It has also committed to charging infrastructure and has the highest share of EVs on the road of any state.

According to Bloomberg NEF's EV Outlook 2018 [https://bit.ly/2tSCSKi], EVs may achieve price parity by 2024, at which point EV sales will take off, soaring from 1.1 million in 2017 to 11 million in 2025 to 30 million in 2030. By then, EVs will have become cheaper to make than gas-fueled vehicles, and by 2050, they will comprise 33 percent of the global car fleet and 55 percent of new car sales.

From the perspective of most American cities, where the occasional

### Annual Global Light-Duty Vehicle Sales



The tipping point. According to Bloomberg, EVs will achieve price parity with internal combustion engine vehicles by 2022.

*Tesla* is still a rare sight, these numbers may sound impossible, so it's helpful to zoom out for a global view, where whole regions are charging toward a zero-emissions future. Several countries have set



Set to launch. After a strong start in California, Toyota's hydrogen fuel cell-powered Mirai is headed for a national rollout.

targets for phasing out vehicles powered by fossil fuels. Norway has decreed that by 2025 all new cars must be zero-emission vehicles. Already the country's incentives and policies have fueled a surge of EVs [https://reut.rs/2ENst5I], which accounted for more than half of all new sales in 2017.

India is pledging [https://bit.ly/2qM53Fx] to sell only EVs after 2030. China is taking steps toward phasing out gas and dieselpowered vehicles, not only restricting the number of new fossil fuelrun cars in cities and offering generous subsidies for EVs, but setting EV quotas for carmakers and banning "new independent enterprises" that only produce combustion-engine vehicles.

Some manufacturers are preparing for the inevitable and currently or plan to offer a broad portfolio of alternative vehicles: hybrids, plugin hybrids, battery electric, and hydrogen fuel cell vehicles. Tesla, with its three models, continues to dominate the American EV market, but the field is about to get crowded-very crowded. GM, much to the chagrin of thousands of laid-off workers, announced a restructuring fueled in part by a commitment to EVs. Nissan, maker of the world's best-selling battery electric vehicle (the *Leaf*) recently unveiled two new "concept cars," [https://cnb.cx/2AQOZKJ] illustrating its take on a zero-emissions future. And, more than a dozen automakers have announced plans to release electric SUVs.

A few automakers are also hedging their bets with hydrogen. Toyota, building on the success of its signature gas-electric hybrid, the Prius, now offers the Prius Prime, a plug-in hybrid, which boasts 133 MPGe (miles per gallon equivalent) and an all-electric range of 25 miles. But the company has also committed to fuel cell technology and began offering Mirai, its hydrogen fuel cell vehicle, to California customers in late 2015. *Mirai* boasts a range of nearly 275 miles on 5 kg of hydrogen, which is the energy equivalent of 5 gallons of gas. And unlike EV charging, filling the tank with hydrogen takes just a few minutes. "We see [hydrogen] ramping up similar to the Prius, starting with a few early adopters," says Russ Koble, communications manager for Toyota. He adds that Toyota has committed to building 30,000

fuel cell stacks by 2020.

Though making up only a tiny fraction of U.S. sales, fuel cell

vehicles are already taking off in parts of Asia and Europe. One attractive benefit of hydrogen is that it can be used to store wind and solar energy, says Koble. In theory, hydrogen could be used to store energy during times of peak production and provide energy during times of peak demand.

Which brings us to another key part of the magic formula to broad adoption: convenience.

### CHARGING AND FUELING INFRASTRUCTURE

EV charging stations are becoming more common, especially in certain regions. For instance, the Pacific Northwest states and Canada have collaborated on the West Coast Electric Highway [https://bit.ly/2CtPDO4], reducing "range anxiety" by ensuring



Follow the electrons. The West Coast Electric Highway is a network of fast charging stations strung along major highways running from California to British Columbia.



drivers can access EV charging stations every 25 to 50 miles when traveling along Interstate 5, the main north-south artery serving the region.

When it comes to hydrogen fueling stations, the landscape is much spottier. There are clusters of hydrogen fueling stations in Canada particularly British Columbia and Toronto-as well as in Northeast cities, including Boston. But California has the most robust network. Local and state governments, NGOs, carmakers and suppliers all play a role in promoting charging and fueling infrastructure. For instance, Toyota and Honda (which also markets a fuel cell vehicle in the U.S.) have partnered with Shell to bring more hydrogen stations to California, and Shell and Toyota are developing the first hydrogentruck refueling station at the Port of Long Beach.

However there are some regulatory hurdles that must be overcome, Koble notes. "There's a lot of fear around hydrogen," he says. For instance, the Port Authority of New York and New Jersey currently doesn't allow hydrogen fuel cell vehicles on certain bridges and tunnels.

### **OUANTITY AND OUALITY OF LIFE**

A strong economy plus low fuel prices equals more driving. In 2015, with the Recession in the rear-view mirror, Americans logged a record-breaking 3.1 trillion miles.

It's an irony that's unfortunately mirrored in other sectors: Yes, our refrigerators are way more efficient per unit than in the 1970s, but they're also way bigger, and many households have more than

one unit (and in some cases, relegate the old, inefficient fridge to the garage, where it continues to waste energy).

Quantity affects quality. Whether your vehicle runs on gas, hydrogen or electricity, sitting in traffic is no fun. California, the same state that boasts such progressive policies when it comes to promoting alternative-fuel vehicles, also has the most registered automobiles of any other, and several of the Golden State's cities suffer from notoriously congested roadways. A lack of affordable housing is driving up the number of "super-commuters"—those who spend two hours or more per day driving to and from work.

The costs of being stuck in traffic can be quantified. According to INRIX, a transportation analytics firm, traffic jams cost each San Francisco driver \$2,250 and the city \$10.6 billion in 2017. The costs were both direct-fuel and time wasted-and indirect-the freight and business fees "from company vehicles idling in traffic, which are passed on to households through higher prices."

These realities are forcing tough decisions about where to live and work. I know many couples and families who have abandoned the California dream for something more affordable, and less frenetic and complicated.

Bostonians who drive spend a lot of time sitting in traffic. That could help explain why vehicle ownership fell 9 percent in the five-year period between 2010 and 2015. The decline can in part be explained by a reverse migration from the 'burbs back to the city's core, where people can walk or cycle to work, along with the growing popularity of car-sharing services and alternative taxi services, such as Uber and Lvft.

In addition, mass transit systems are being modernized with the use of smartphone-integrated solutions, such as apps that tells you when the next bus is due to arrive at your nearest bus stop.

# **Making Hydrogen: The Source Matters**

N EV THAT CHARGES ON SOLAR POWER has more bragging rights than an EV charged with electricity from the grid. Similarly, not all hydrogen fuel sources are created equal when it comes to energy use and emissions.

As of now, most hydrogen fuel is made through "natural gas reforming." In this process, steam is used to separate hydrogen from methane (natural gas) molecules. Another method for capturing hydrogen is electrolysis, where an electric current is passed through water to separate hydrogen from oxygen. Fuel cell vehicles don't create any tailpipe emissions; hydrogen combines with oxygen to generate electricity, which runs the motor; the only by-products are heat and water vapor. Even if you consider the upstream energy costs associated with "making" hydrogen, the total greenhouse gas emissions are 30

percent less. California requires that at least one-third of its hydrogen fuel comes from renewables, whether biogas, electrolysis or biomass, ensuring that cars that run on hydrogen produce even fewer emissions that gas-powered vehicles

# **Pathways to Power** Established ndustrial Proce Natural Ga



The Department of Energy (DOE) has set a target of producing hydrogen at less than \$4 per gasoline gallon equivalent. In the near future, more and more hydrogen fuel will be captured through renewable sources, making it an even more attractive and sustainable option

The Boston example hints that a multi-pronged approach to traffic management can be successful. This strategy, which some call "modern mitigation," upends the usual way of doing things. For example, developers are required to mitigate the traffic impacts of their projects, typically by widening roads and/or providing more parking. But these measures often induce more traffic and make roadways decidedly less friendly for bikes and pedestrians. A "modernized" mitigation approach awards measures that reduce traffic, rather than accommodate it.

Here are some of those traffic-reducing measures:

- Develop shopping and restaurants that are accessible by bike or foot
- Make public transit (and transit stations) appealing, attractive and easy to use
- · Create bike lanes and pedestrian paths and crossings
- Add bike facilities—parking, storage and showers
- Provide child care at work places
- Create thoughtful infill
- Strengthen "first and last mile" connections
- Award car-pooling and ride-sharing
- Incentivize car-sharing
- Encourage flexible work schedules

A report, titled Modern Mitigation: A Demand-Centered Approach, expands upon these opportunities. And to be fair, California has passed a state law that encourages, if not require this type of mitigation, and several California cities are creating plans based on modern mitigation strategies.



A self-perpetuating problem. Developers are often required to widen roads to offset a project's environmental impact, such as increased traffic—but that sometimes creates more road access problems anyway.

### SMARTER CITIES; RURAL REALITIES

If you scan the news, it often seems like the future is reserved for city dwellers. Rural communities face different challenges than citiesbrain drain, aging populations, deferred maintenance of housing stock, aging infrastructure, and lack of access to resources, to name a few. Rural residents can feel left behind, whether talking about high-speed internet or public transportation. Rural residents often drive more, too, and usually without passengers. However, some



### **A Portal into the Future**

UEL CELL STACKS are not just powering sedans. In 2017, Toyota launched Project Portal with Alpha, a prototype big rig that runs exclusively on hydrogen. In 2018 the company launched its second prototype. Beta is larger and lighter and enjoys a range of 300 miles. Soon, 10 of the Class 8 rigs will be shuttling goods between Los Angeles and key destinations. The project is a collaboration between Toyota, Shell Oil, Kenworth Truck Company and the Port of Los Angeles. The sound of idling diesels at a truck stop could be a sound of the past.

rural communities, including my own, are trying to address these issues. My community is 20 miles from the nearest town (and grocery store). One thoughtful resident created our community Facebook page, and it has since become a vital hub for sharing news, resources and advertising events, and coordinating rides "down the hill." People post when they need a ride, or sometimes ask a neighbor to pick up an item from town for them. Our one restaurant has an EV charging station, and a few forward-thinking residents are considering purchasing an electric car that can be used by the entire community.

### THE SCALES OF MOBILITY

In a truly "aligned" society, people should be able to comfortably, affordably and efficiently travel across the country, between cities, across town, across the street and across the room. In some cases, these movements may be virtual.

A smart home system such as the one featured in The Align Project can enable a person to live independently and safely manage their home. "Digital doctors" can help people with chronic conditions manage their conditions without necessarily making a trip to the doctor's office-or more expensively, to the ER.

We'll be exploring these and other ways to prepare for a More Aligned Future in our final installment of The Align Project. GB

About the Align Project: The Align Project is a one-year demonstration project designed to challenge entrenched ideas about how we live in the U.S., and offer suggestions for how we can align our lifestyles with our changing socio-economic and environmental realities. Visit https://www.greenbuildermedia.com/vision-house-the-align-project to learn more.

## **CODEARENA** The Latest Rules. Regulations and Codes

The Latest Rules, Regulations and Codes Impacting Sustainable Construction

# **DOE's Bad Research Recipe:** Status Quo

# The R&D money is there, but DOE won't spend it.

### **BY MIKE COLLIGNON**

S BUILDING CODES TREND towards zero-net energy, a common question arises in code development discussions: How are we going to truly accomplish this transformation at scale? It's a fair question, since there are a host of hurdles to overcome, such as cost (of renewables and storage), periods where the sun doesn't shine or the wind doesn't blow, duck curves, plug loads, etc.

This herculean task requires cooperation and effort from a variety of groups. Product manufacturers need to innovate and create. Homebuyers need to choose sustainable products. Homebuilders and subcontractors are needed to properly install said products. Regulatory bodies need to allow the use of innovative products in their building codes. Governments should be providing incentives for innovations that help with energy security. Together, all the aforementioned parties form the patchwork needed for real implementation. Just like a chain, the weakest link will dictate the ultimate outcome. While we often call out groups that work to impede the progress of energy efficiency, it seems there might be an even weaker link in the chain.

The Department of Energy (DOE) has not been living up to its legal obligation to spend money on research toward renewables and energy efficiency. According to the Congressional Budget and Impoundment Control Act, "it is illegal for a federal agency not to spend funds appropriated by Congress unless the president has notified Congress". No such notification has been sent, and a public records search by the Natural Resources Defense Council (NRDC) recently showed that DOE spent only 21 percent of its FY2018 funds for Advanced Research Projects Agency-Energy (ARPA-E), the office that invests in early-stage energy technology. DOE has also been shorting its own Office of Energy Efficiency and Renewable Energy (EERE) by deploying just 14 percent of FY2018 funds.

For example, ARPA-E has only used \$44 million (12 percent) of its FY2018 budget toward research and development. The good news is that there are three outstanding Funding Opportunity Announcements (FOAs) that will utilize \$118 million in FY2018 funding. The bad news is that: a) the funds were appropriated 10 months ago, b) \$118 million represents *less than half the money not* 



**No power here.** During the past two years, the Department of Energy has spent only a fraction of the funds it has allocated for green research.

spent, and c) we're already three months into FY2019.

The situation at EERE, as previously mentioned, is even more dire. Spending is below the 15 percent mark, and according to NRDC, the near radio silence has been exacerbated by cancellations and inactivity on the issuance and awarding of FOAs.

A DOE spokeswoman told *Bloomberg Environment* that "ARPA-E funds usually aren't spent in the same year because of the time it takes to review, select, and negotiate projects".<sup>1</sup> No one will be surprised at the confirmation of bureaucratic lag. However, DOE spent only 35 percent of its FY2017 ARPA-E funds and 29 percent of FY2016 funds. This is in stark contrast to the previous administration, which spent 90 percent of the FY2015 funds. DOE went on to say that "\$288 million of ARPA-E's \$353 million in FY2018 appropriations is obligated or allocated to grant opportunities, and the remaining \$65 million is allocated to several grants to be released in early 2019."<sup>1</sup>

DOE is claiming there are plans to spend the money, but it still doesn't answer the question of what happened to the lack of FY2017 and FY2016 spending. And to be perfectly clear, DOE's research funding is "no-year money." That allows DOE "to support R&D opportunities that might not be aligned with the government's fiscal calendar."<sup>2</sup> However, the expectation is that the money will be spent. Saving it for a rainy day is not in line with the spirit of Congress's appropriation.

One could say that maybe DOE was trying to save taxpayer money by reducing spending. In a time of bloated government budgets and historic deficits, a little fiscal prudence might be welcome. But we're talking about 60 percent or more going unspent. That flies in the face of their legal obligation per the Congressional Budget and Impoundment Control Act. Also, the spending has been proven [https://bit.ly/2HaSGk6] to generate a positive ROI for consumers (i.e., taxpayers).

This shouldn't come as a big surprise to anyone paying attention



to the (lack of) environmental vision of the current administration. They proposed eliminating ARPA-E funding in both the FY2017 and FY2018 budget proposals, in addition to proposed cuts to EERE's budget by nearly 70 percent over the same two fiscal years. (Both efforts were thwarted by Congress.) One year ago, the Government Accountability Office (GAO) ruled [https://bit.ly/2TPhTSx] that DOE had "intentionally withheld FY2017 funding for ARPA-E, but didn't send an official report to Congress because the Energy Department planned to spend the funds."<sup>1</sup> The Administration has also weakened or eliminated numerous environmental regulations, and have even gone so far as supported fossil fuel showcases at the COP23 and COP24 meetings.

The irony of the situation is that it could make America less great. How? Take the recent cancellation of a \$46 million EERE grant opportunity. After spending nearly \$0.5 million and just before career-level staff were going to select the grant recipients, the grant was canceled, and the FOA was rewritten and reissued. All 300 applicants, who had spent sizable time and money to prepare their applications, were notified that they would have to reapply if they wanted to be reconsidered. Commenting on this troubling event, Mike Carr, former principal deputy assistant secretary for EERE from 2012-2015, told *Bloomberg Environment*, "It's a competitiveness issue. If they can't count on [DOE] to move this forward, then China is sitting there with a big checkbook. There's plenty of places where researchers can be enticed to go, and that's the disaster for us."<sup>3</sup>

What does all this mean for the homebuilding industry? As mentioned before, it makes it a lot harder to realistically reach the goals of widespread, zero-net energy construction.

Setting aside that lofty goal, it also complicates some builders' efforts to package non-leased solar with their homes. To be fair, some are already doing this with success. However, what happens when the market of homebuying early adopters is exhausted? To capture the fat part of the bell curve, renewables and (especially) storage still need to come down in price, and increase in productivity. Even for the early adopters, it's much more expensive for them to achieve their net-zero goals. Whether it's a 100 percent grant, or a 50-50 matching grant program, there's a sizable amount of money not being put to use. Restricting funding to needed research and development is not a recipe for success. It is, however, a recipe for maintaining the status quo, which seems to be what this administration aims to do.

Public utilities weaning themselves off coal and embracing renewables are begging for utility scale storage solutions. To feasibly get there, R&D funding is needed...now. To be clear, DOE's funding is not a silver bullet to achieving zero-net energy construction. DOE is merely one link in the chain. Hopefully DOE leadership can leverage repeated scientific reports, resist fossil fuel influences and do its part to support sustainable construction. **GB** 

### Links:

https://bit.ly/2CnT4Wv
 https://on.nrdc.org/2FtImBb
 https://bit.ly/2ATr6S6

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

# COURTESY OF The Green Builder® Coalition

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

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# **FROM THE TAILGATE** New Offerings for the Sustainable Minded

**By Ron Jones** 

# **TNAH, the Never-Affordable Hoax**

YPOCRITICAL (ADJECTIVE): The contrivance of a false appearance of virtue or goodness, while concealing real character or inclinations. Hardly a week goes by when I don't receive multiple communications from the National Association of Home Builders (NAHB) beating the drum for housing affordability, and blaming any lack of same on a revolving list of outside forces-namely, regulations, safety and performance requirements, the scarcity of buildable lots, escalating costs of materials and labor, tightened lending rules, unfavorable interest rates and housing policy in general.

These are all legitimate concerns for builders, homebuyers and renters alike. One indicator is the constant adjustment in the size of the typical new single-family home, which shrank slightly in the last reporting period to something less than 2,400 square feet. In a way, this reflects the fickle nature of the American consumer, the same folks whose car-buying choices are often predicated on the current price of gasoline, rather than any long-term cost of operation. But it demonstrates that size really does matter, especially when it comes to what a family can afford.

The NAHB does a masterful job of manipulating its messaging to simultaneously position itself as the leading advocate for the homebuying public and as an indispensable ally protecting its industry members. In doing so, the organization seeks not only to claim the loftiest pinnacles of industry knowledge but also the moral high ground associated with homeownership.

So, this brings me to the glaring contradiction that NAHB rolls out at the beginning of each new year through its official demonstration house, proudly called The New American Home (TNAH). In this cycle, it takes the form of a spectacular show home in the foothills outside Las Vegas that embodies brilliant design, cutting-edge technologies, all the imaginable bells and whistles, premium products and systems, impeccable workmanship, and—oh by the way—something a little north of 9,000 square feet worth of the American Dream.

We are not talking about an exception here. NAHB's poster child for the epitome of American residential aspiration is almost always enormous in its proportions, bearing little resemblance to a dwelling that any regular working family could harbor hopes of owning. In this case, we could fit almost four of those typical new homes into TNAH 2019. I have called out NAHB on multiple past occasions regarding the scale of these projects and the message being conveyed, but its justification is that TNAH is a representation of what's possible, not what's practical, responsible or achievable.



Let me be clear: My purpose here is not to condemn the builder nor the eventual buyer of this home. If there is a market to be served for buyers in search of homes of this scale-and it is obvious that there is-then it is certainly the purview of luxury homebuilders to meet that demand.

It is that hypocritical message that I'm opposing. If NAHB wants to claim the noble title of champion of the homebuilding industry and protector of the American Dream, why not choose to bring to life projects that exemplify the nexus of affordability, performance and resilience? Why not divide those 9,000 square feet into three or four structures featuring realistic solutions to the challenges shared by homebuilders and homebuyers?

At the end of the day, I suspect the trade group would harvest just as much sponsorship revenue and media coverage out of its program. Moreover, it could be providing valuable lessons of successful strategies to its members.

Heck, it might even finally be done with a straight face. GB



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