Award-Winning Coverage of Sustainable Construction, Products and Lifestyles



Green Builder Media presents **SUSTAINABILITY** Symposium 2020

Improving the Human Condition Through the Built Environment

www.greenbuildermedia.com/improving-the-human-condition-2020

SAVE THE DATE! JANUARY 20, 2020

University of Nevada, Las Vegas Campus Visit www.greenbuildermedia.com/improving-the-human-condition-2020

to opt in for more information about this pioneering event.

We'll let you know when registration opens!

Green Builder[®] Media is proud to announce our fourth-annual Sustainability Symposium.

SESSIONS WILL COVER:

- Solving for energy and water, so that they do not become major inhibitors to growth and prosperity
- Sustainable innovations that will transform the building industry
- Social justice issues as they pertain to the built environment on a local, national and global scale
- 2020 Sustainable Development Benchmarks: Where have we succeeded, where have we failed—and we go from here?
- The Built Environment Today: Are we designing and constructing properly for our changing climate and growing social and economic inequity issues?

SPEAKERS:







ED MAZRIA, founder of Architecture 2030 and internationally recognized architect, author, educator and visionary with a long and distinguished career.

GENE MYERS, CEO/founder of

Thrive Home Builders, six-time



winner of the Department of Energy's Grand Award for Innovation, and the first production builder to deliver "solar standard" homes, build

net-zero communities, and use Colorado beetle-kill lumber in the construction of its homes.

HOME OF THE YEAR AWARDS DINNER : MR CHOW in Caesars Palace on January 19

Green Builder[®] Media's annual Home of the Year Awards are recognized as one of the industry's most innovative and important programs that identify authentic, advanced, beautiful and sustainable projects and the professionals who design and construct them.

Green Builder[®] Media will celebrate our annual Home of the Year Awards winners at a special VIP dinner, held on January 19 at the elegant MR CHOW in Caesars Palace.

MITSUBISHI ELECTRIC TRANE HVAC US LLC





7/30/2019 1:45:56 PM

EDITOR'S NOTE The Inside Scoop

By Matt Power Editor-in-Chief

Panasonic

Feeling Down? Try Some Actual Reality

ODAY'S MANY MAN-MADE crises can be addressed, but not if we listen to hucksters and sociopaths.

More often than not, predictions about the future get it wrong. As recently as the late 1960s, when the population was 3 billion, author Paul Ehrlich's warnings predicted in The Population Bomb that humans would overwhelm Earth's resources within 10 years, leading to vast famines, war and collapse. We'd be living in a "Soylent Green" world, eating each other to survive.

Fortunately, predicting the future is fraught with uncertainties. That's not to say Ehrlich's dire warnings won't come true eventually, but so far, at least, other factors-advances in farming, digital

communication, and so on-have (mostly) headed off the worst scenarios.

Let us hope that the same uncertainty holds true with regard to the Earth's ecosystems. The extinctions and loss of habitat happening

HOW AMERICANS THINK THE WORLD WILL END Nuclear War 28% Don't think there 20% will be an apocalypse 16% Climate change 16% Judgement day 9% Worldwide revolution 8% Something else

2% Zombies 1% Alien invasion CREDIT: YOUGO

2 GREEN BUILDER July/August 2019



now are real and dire, but perhaps not unstoppable.

As I stood in a hardware store the other day, the customer in front of me launched into a sudden and unexpected tirade about Barack Obama's birth certificate. He told the rather stunned-looking clerk that the fact that we had an "alien" as our president "ruined the country" and is the cause of all of our troubles today. He was literally sputtering with rage. The fact that we have a new president, he said, is irrelevant. The damage was done!

Sadly, there's an undercurrent of misinformation that has seeped into American culture, and it's doing none of us any favors. These sinister stories (and we do love our stories) are neither random nor unavoidable. Talk shows, TV networks

and hackers start them, and anti-social media amplify them. I say *anti*-social because too often, they fuel our worst instincts,

not our best.

Deep within the human psyche is a craving for self-destruction. If the world ends during our lifetime, then we were right, and the world DID go to hell in a handbasket!

Yes, we face massive challenges. Climate change is real, and the world is overheating. But solar energy has just passed all fossil fuels in price parity. It's now economically inevitable. Birth rates are dropping in many industrialized nations. Many nations have begun to tackle plastic pollution. We're close to a cure for Alzheimer's and early cancer detection, and on and on. Behind the dark clouds of misinformation, the future could still be bright.

Can corporations, like the ones highlighted in this issue, be part of that brightness? Possibly. But all companies need to stay in "actual reality" and do the hard work of course correction, rather than denying and obfuscating the facts.

I have friends with political views 180 degrees from mine. Yet we're friends. We do projects together, go fishing or just sit in silence, without butting heads about how the world will end. Listening, talking, working: That's actual reality. Blaming, raging, denying: That's the dead-end road to nowhere. GB

www.greenbuildermedia.com

Maximize every roof

Install the power panel you've been waiting for. HIT[®] AC Series combines the module efficiency of Panasonic solar panels with the intelligence of Enphase microinverters. Extract maximum power production from every roof size and shape. A built-in Enphase IQ[™] 7X Microinverter helps deliver an all-in-one module that offers design flexibility, reduced installation time, and a higher ROI.

Find out more at na.panasonic.com/us/solar













Imagine what your house would look like if the greatest minds in sustainability, performance, and design came together to build it - with the goal of remaining within your design parameters and budget.

> HE EXPERIENCED PROFESSIONALS at Green Builder Media have joined forces with internationally-acclaimed building scientist and production builder CR Herro (VP Innovation, Meritage Homes) and pioneering green architect Stace McGee (Founder, Environmental Dynamics Inc) to create the VISION House Seattle Cascades: The House the Experts Built.

Located in Enumclaw, WA (the gateway to Mount Rainier National Park) the VISION House Seattle Cascades features the most advanced products, systems, and technologies to achieve extraordinary performance results – all at a reasonable price point. The net-zero, solar powered, high performance, resilient, healthy, and intelligent home boasts stunning design details, an open floor plan, and innovative materials.

Through meticulous planning, space is optimized to significantly reduce material use, jobsite waste, and cost. By deploying advanced building science and superior construction techniques, the home will exemplify resource efficiency and promote occupant well-being.

The result: a simple, replicable template that homeowners and builders can follow, based on decades of experience in the fields of green building, sustainable design, and building science.

FOR MORE INFORMATION:

Look for ongoing editorial coverage about the VISION House Seattle Cascades from Green Builder Media in the coming months. In the meantime, be sure to check out the project microsite at www.greenbuildermedia.com/vision-house-cascades for updated articles, videos, and news about the project.

UDOUOL

western



Whirlpool Panasonic Control

SCULTURED STONE

ralSteel



Meet the Series 7600. Our strongest and most energy-efficient aluminum multi-slide door ever.

PROJECT SPONSORS:

Green Building NEWS

The Latest on Sustainability and Renewable Energy

Garden State Goes All In for Green Power

New Jersey plans to switch off all non-renewable energy by 2050.

EW JERSEY HAS UNVEILED an initiative to power the state entirely by renewable electricity by 2050, largely through expanded electric-vehicle adoption and offshore wind and solar unit installations. The proposal, known as the Energy Master Plan (EMP) will also create additional clean energy-related jobs and training programs, according to Gov. Phil Murphy. Also, many of the EMP's benefits will be aimed at underserved areas, such as low-income communities.

Murphy calls the EMP "a comprehensive roadmap toward achieving our goal of a 100 percent clean energy economy by 2050." It is "a critical step forward in reducing the effects of climate change and securing our state's clean energy future for the benefit of all New Jerseyans and for generations to come."

Other goals include maximizing energy efficiency and conservation; reducing energy use and emissions from the building sector through decarbonization and electrification; the expansion of statewide net-zero carbon home incentive programs; modernizing the grid and utility infrastructure; and leveraging the economic and environmental opportunities that clean energy provides, Murphy notes.

The New Jersey Board of Public Utilities will host public meetings to collect feedback and comments from key stakeholders until Sept. 16.



Net-zero know-how. New Jersey Gov. Phil Murphy considers the state's Energy Master Plan critical to its fight against climate change

USGBC Unveils 'Outstanding Projects' of 2018

LEED Project of the Year will be decided by member online voting.

CENTURY-OLD RHODE ISLAND home has been named as the U.S. Green Building Council (USGBC)'s "Outstanding Single-Family Project" of 2018. The Holt Residence in Providence, R.I., was recognized for its absence of harmful volatile organic compounds (VOCs) in its building materials, as well as the 1,000-gallon cistern rainwater capture system used for landscape irrigation, according to USGBC. Holt was one of 12 finalists recognized in the council's annual **2018 LEED Homes Awards**, which features "residential projects, developers and builders using LEED to improve quality of life and create healthier and more resilient communities, USGBC President and CEO Mahesh Ramanujam says.

Also identified as outstanding single-family homes were the Silverman Residence in George Town, Cayman Islands, and the Owen Residence in Little Rock, Ark.

Marshall Gobuty, president of Pearl Homes in Bradenton, Fla., First Community Housing in San Jose, Calif., and Brightview Senior Living in Baltimore was recognized as "Outstanding Developer."

Eighteen builders were recognized as "LEED Homes Power Builders," developers and builders who have "exhibited an outstanding commitment to LEED and the residential green building movement," Ramanujam notes. Power builders had LEED certification on at least 75 percent of their projects or unit count

built in 2018.

And for the first time, USGBC members were given the chance to vote online for the "LEED Homes Project of the Year." Results were not available at press time. A complete list of winners is available on the **USGBC website**.



Standout effort. An extensive rainwater capture system helped make the Holt Residence in Providence, R.I., one of the winners of USGBC's 2018 LEED Homes Awards competition.

www.greenbuildermedia.com



Ready made. Two prefabricated townhomes were completely assembled in less than five hours, the first of 30 planned for the Olympic Valley area near North Lake Tahoe, Calif.

Speedy Prefab Full-sized 'instant' homes

make their debut at historic Olympic venue.

T TOOK THE THREE MEDALISTS in the biathlon at the 1960 Winter Olympics in Squaw Valley a little over 4.5 hours combined to win their medals. That's also how long it took construction company Plant Prefab to install a 6,000-square-foot prefabricated duplex in the same area.

Plant Prefab, based in Rialto, Calif., quickly assembled the unit's six modules to create two complete threebedroom, three-bathroom townhomes in slightly more than half the time allotted for the project. Builders originally estimated it might take eight hours to complete the job in what is now known as Olympic Valley, Calif.

According CEO Steve Glenn, the build demonstrated how quickly and efficiently a prefab home can be built and erected, even during less-than-ideal weatherrelated work conditions. "A traditional build would have been nearly impossible," Glenn notes. "Building the modules in [our] climate-controlled facility and having on-site contractor and surveying work completed while the module builds were in progress cut the total construction time in half."

Plant Prefab is the first prefabricated home factory in the U.S. that employs sustainable construction techniques, materials and processes, according to Glenn. That includes drywall and insulation with the highest recycled contents commercially available, non-VOC paints and stains, low-energy lights, low-flow water fixtures, and Forest Stewardship Council-certified wood.

The Olympic Valley site will eventually have 30 such townhomes, most expected to be constructed within the next year. They will sell for an average of \$950,000 each.

www.greenbuildermedia.com

Breaking ground on groundbreaking communities



Break new ground with a geothermal community

Geothermal communities are gaining popularity all around the country. In fact, several of these new communities are completely sold out and new homes are being snapped up well before construction ever begins. Geothermal is simply the most efficient way to heat and cool a home, and economies of scale for all-geothermal communities make them more economical to install. Whether potential homeowners are tech savvy, environmentally conscious, or looking to save money, geothermal has something to offer. Let WaterFurnace be a resource to provide best practices, help avoid mistakes others have made, and help your development become successful.

Learn more at waterfurnace.com/neighborhoods



WaterFurnace is a registered trademark of WaterFurnace International, Inc. ©2019 WaterFurnace International Inc.

Once-Hot Coal Grows Colder

Renewable power continues to extinguish what was America's top energy source.

HE PUBLIC'S TASTE FOR COAL CONTINUES TO SOUR: Coal consumption in the United States is at its lowest level since 1978, with potential energy production dropping behind renewables for the first time, according to two industry-specific reports.

In 2018, Americans used 687 million tons of coal, with nearly all going as an energy source, according to the U.S. Energy Information Administration. That's down from the industry's peak of 1.13 billion in 2008. The steep drop is the result of increased capacity by power plants to run on renewable sources such as wind and solar-which officially surpassed coal in April-which itself resulted from renewables' lower operating costs, according to the Institute for Energy Economics and Financial Analysis (IEEFA).

Analysts note that coal's decline comes in spite of the Trump Administration's efforts to boost the industry by scaling back environmental regulations. Economics, they say, means more to the public than the number of restrictions placed upon a product's production and development. "Coal has no technology path," says Jeff McDermott, managing partner at investment bank Greentech Capital Advisors in New York City. "It's got nowhere to go but extinction."

IEEFA notes, however, that having the capacity to generate more electricity from renewables than coal doesn't mean it will happen immediately.



Lights out? The public's appetite for coal as an energy source has dropped dramatically in 10 years, largely due to the ever-more-affordable renewables, such as solar and wind.

It probably won't be a regular occurrence for at least several years, according to Matthew Hoza, senior energy analyst at consulting firm BTU Analytics in Lakewood, Colo.

It's All Garbage Now

Recycling becomes less 'right thing to do' and more 'what to do?' for U.S. cities.

SIA'S GROWING DISINTEREST in American recycled materials is forcing many communities to curtail or discontinue their reusable waste collection and processing programs, because they are too expensive. This, in turn, is giving subcontractors such as roofers, builders and plumbers—and homeowners a headache as they try to find somewhere other than the landfill to send discards such as scrap wood, nails and plastic wrap.

LG

0 0

MILITIV

According to a report in the New York *Times*, China's 2018 decision to stop buying U.S. recyclables because of the excessive garbage they contained is a key reason many recycling companies have fewer buyers, driving up their costs. Some of those recyclers have responded by raising prices by up to 400 percent on their No. 1 customers: U.S. cities. This leaves many municipalities with an unpleasant choice of raising taxes, cutting city services or abandoning recycling altogether.

LG

Install Trust

Give your customers a better relationship with the sun

LG Solar is backed by decades of development. Recommend our modules for your next install and deliver the premium technology & outstanding performance your customers expect for their homes.

LG Solar products are backed by an extensive 25-year warranty on product, performance, and labor*. Whether you recommend the NeON[®] R, the NeON[®] 2, or the NeON[®] 2 Black modules, you'll have the confidence of a Tier 1 Brand behind you. Install the brand they can trust. Install LG Solar.





* Labor costs in the rare case of a needed module repair or replacement are covered up to \$450 (C) 2019 LG Electronics, U.S.A., Inc

Mitch Hedlund, executive director of

nonprofit Recycle Across America, notes

that public participation in the high-cost

recycling programs has been so success-

ful that even handling all of a city's trash

processing doesn't make life profitable for the waste management industry-which

leads to recyclers or cities giving up on

In response, cities, builders and others

are taking less-than-sustainable steps to

handle their reusables. Philadelphia burns it

instead of sending it to the landfill. Chicago

has a new "grossly contaminated" classifica-

tion for recyclables that contain even one

non-recyclable item—sending the whole



Trash talk. It's not as easy for cities to handle their recyclable waste-which is forcing them to find other, not-so-eco-friendly ways of processing it.

batch to the landfill. Flagstaff, Ariz., pretty much only accepts specific bottles, jugs and jars. Memphis has all but dropped recycling services altogether, but still leaves bins in place to "preserve the culture" until mainstream recycling returns, the Times reports.

the idea



Tyvek. HomeWrap. yvek Tyvek HomeWrap Tyvek vvek Tyvek. HomeWrap. yvek. vvek yvek T yvek Ty

Because your reputation is your business

You take pride in doing your best work on every job. That's why the materials you use matter. DuPont[™] Tyvek[®] has proudly been the industry leader in performance since it invented the house wrap category more than 40 years ago.

Find your total building envelope solution at tyvek.dupont.com

DuPont[™], the Du<mark>Pont Oval Logo, and all trademarks and service marks denoted with [™]. ⁶⁴ o are owned by affiliates of DuPont de Nemours, Inc. unless otherwise noted. © 2019 DuPont.</mark>

Volume 24, Issue 4 July/August 2019 ublished by Green Builder® Media

GREEN BUILDER[®]

Problems with your subscription? For assistance, plea

Subscription Information Subscribe to Green Builder magazine and receive valuable information about how to increase your bottom line differentiate your business and change the world. At \$39.95, it's an easy return on your investment. Just go to www.greenbuildermedia.com and click on "subscribe." To unsubscribe or change your address, email vour name. company and address to: mary.kestner@greenbuildermedia.com.

Green Builder has reduced its environmental impact through Zerofootprint Offsets www.zerofootprintoffsets.com. Almost all of the natural resources used to produce Green Builder will be

returned to the environment by planting trees and restoring watersheds. Also, greenhouse emissions will be mitigated through carbon offsetting. (Printed on recycled paper.)



NEW! SUBSCRIBE TO OUR NEWSLETTERS www.areenbuil dermedia.com/



facebook.com/GreenBuilderMed

Linked in

pinterest.com/greenbuilder

f

()

ISSN 1559-4971 The trademark and service mark GREEN BUILDER is registered under the U.S. Trademark Act for a variety of goods and services.

www.greenbuildermedia.com/ subscribetogreenbuilder Click above to subscribe to Green Builder magazine today!

www.greenbuildermedia.com/ about-green-builder-media Click above to learn more about Green Builder' Media.

MISSION STATEMENT: "Our mission is to effect meaningful, positive change for a better world. As advocates for sustainability, we provide mind-expanding information that catalyzes and inspires commitment to sustainable living."

www.greenbuildermedia.com

EDITORIAL Matt Power Editor-in-Chief matt.power@greenbuildermedia.com 207-619-2713 Alan Naditz Managing Editor

alan.naditz@greenbuildermedia.com 916-681-2057

John O'Brien Art Direction john.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 mary.kestner@greenbuildermedia.com

CIRCULATION Mary Kestner

mary.kestner@greenbuildermedia.com **GENERAL INFORMATION** admin@greenbuildermedia.com

FINANCE Hannah Judson Chief Financial Officer hannah.judson@greenbuildermedia.com 970-397-5483



craig.coale@ 512-344-9754

Scott Cunningham Southeast scott.cunningham@greenbuildermedia.com 678-576-1487 AL, AR, FL, GA, NC and SC

John Clemens West Coast ns@greenbuildermedia.com iohn.cle 503-352-9754 AZ, CA, NV, OR and WA

AUTOMOTIVE ADVERTISING SALES Dawn Rivard n@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

GREEN BUILDER

Digital Archive

Looking for a specific building science article about fly ash or wood-burning stoves? Trying to remember the details of a great green house featured in Green Builder?

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.



• OUPONT • **Ivvek**

TABLE OF CONTENTS

FEATURES

2019 ECO-LEADERS: A LEADING ROLE This year's class of elite green thinkers shows that being an	14
eco-pioneer isn't a "first" anymore—being the most innovative is.	
Elevating Sustainability	
Corporations need to correct course now to prepare for the financial challenge posed by climate change.	
Building Industry Exemplars	
Five recognizable names with innovative ties to the green building industry.	
Aspirational Firms	
Five leaders from outside the industry with tactics that inspire everyone.	

THE VISION HOUSE: THE HOUSE THE EXPERTS BUILT

The latest in Green Builder[®] Media's special collection of Tiny Home projects, VISION House[®] Seattle Cascades will feature the most advanced products, systems and technologies to achieve extraordinary performance results—all at an affordable price point.

REACHING NEW HORIZONS

This revitalized multifamily marvel proves that affordability and sustainability can co-exist.

DEPARTMENTS

EDITOR'S NOTE	
GREEN BUILDING NEWS	
INTERNET OF THINGS	
INDOOR AIR QUALITY	
FIELD NOTES	
CODE ARENA	
TAILGATE	

HERE'S A SAMPLE OF WHAT'S INSIDE

.38

.44

"To stay a leader, you need to keep being first and make sure others are following you." PAGE 14

Visit us at www.greenbuildermedia.com

for up-to-date news analysis, case studies, new green projects, code and reg updates, thought-provoking blogs, cutting-edge products and much more.

www.greenbuildermedia.com

Twenty years ago, Trex[®] set out to revolutionize an industry by creating low-maintenance, eco-friendly composite decking. Today, Trex is the #1 selling decking brand in the world. And, for the ninth straight year, we're also the #1 greenest brand in the decking category, according to Green Builder Media's Readers' Choice Awards. Thank you for always embracing what we do next.



#1 Greenest Decking Brand Since 2009.

Learn more about the #1 name in outdoor living at trex.com.



of 0 🛗





A Leading Role

Being an eco-pioneer isn't a 'first' anymore as this year's class of elite green thinkers shows.

BY ALAN NADITZ

S THE CLOCK TICKS toward a voluntary 2050 deadline for nations to level off their greenhouse gas emissions and become carbon neutral—and help keep global warming to around 1.5 degrees Celsius, or about 3 degrees Fahrenheit, an increase scientists expect is still minor enough not to cause permanent destruction to the planet's environment—many companies are doing their part by enacting policies calling for net-zero operations status even earlier, around 2030.

A very commendable effort. But does that make them Eco-Leaders? Not quite. Yes, they're acknowledging the truth of climate change and doing what must be done, and maybe they were the ones who threw down the pro-environmental gauntlet. But if everyone else has now taken up the challenge, those sustainably minded pioneers are not really "leaders" anymore.

Being an Eco-Leader means finding different and better ways to go about saving the environment, or newer and bolder ways to put existing efforts to use. That's what we found with this year's green thinkers: a group that's taken a step beyond simply closing the valves on the fossil fuel-driven exhaust ports in favor of cleaner renewable energy sources. And because this is a worldwide effort, this year we've chosen five recognizable names with ties to the green building industry (our "Building Industry Exemplars") and five outsiders whose tactics impact everyone (the "Aspirational Firms").

Several decades ago, while attending an obscure but "revolutionary" environmental conference, I had the pleasure of meeting a certain eventual (and now former) U.S. vice president who, even then, was very vocal about climate change, pollution and extinction of species. Something he said has stuck with me for almost 30 years: "Anything you do can make you a 'leader' if you're the first to do it. But to stay a leader? You need to keep being first, and make sure others are following you."

That's a goal we can all move toward.



Elevating Sustainability

Corporations need to correct course now to prepare for the financial challenge posed by climate change.

BY SARA GUTTERMAN

ORPORATE SUSTAINABILITY HAS EVOLVED far beyond a feel-good marketing strategy to engender goodwill and loyalty. It has become an economic and environmental imperative, as companies, policymakers and financial regulators across the globe recognize the risks associated with the failure to plan appropriately for climate change. Fortunately, corporations in all sectors of the economy are answering the call with innovative approaches to sustainability.

Armed with indisputable data and undeniable science, Rostin Benham, senior financial regulator and Trump-appointed member of the Commodity Futures Trading Commission (which oversees major financial markets) has publicly declared that the risks associated with climate change eclipse those posed by the mortgage meltdown that caused the 2008 financial crisis and ensuing recession.

"If climate change causes more volatile, frequent and extreme weather events, you're going to have a scenario where these large providers of financial products-mortgages, home insurance, pensions-cannot shift risk away from their portfolios," Benham

says. "It's abundantly clear that climate change poses financial risk to the stability of the financial system.

Behnam is not alone in recognizing the financial risks of a warming world. The European Central Bank recently issued a warning that an intense round of severe weather could destabilize global markets by negatively impacting the balance sheets of unprepared corporations that have not engaged in appropriate risk analysis and proactive planning.

The Carbon Disclosure Project (CDP) found that the world's 500 largest corporations face approximately \$1 trillion in climate changerelated costs, the majority of which could materialize within the next five years.

It is estimated that the world's largest companies may have to write off or retire up to \$250 billion in assets, such as buildings in high-risk flood zones and outdated manufacturing facilities and power plants that can't meet tighter emissions regulations. It's important to note that this estimate only takes into account a fraction of companies worldwide that report their climate risks, and the actual dollar figure associated with these losses will presumably be substantially higher.

In response, companies are stepping up to the climate challenge, implementing comprehensive corporate sustainability plans, making

www.greenbuildermedia.com

bold carbon neutrality commitments, and exploring the business opportunities that come with a warming planet.

AN ALTERNATIVE PLAN WITHOUT ALTERNATIVES

Companies across the sector are embracing renewable energy. Schneider Electric, for example, has committed to power its operations with 80 percent renewables by 2020, and Target has pledged to become 100 percent renewable by 2030.

Other corporations are making big investments in enabling technologies that solve for the risks associated with climate change. For example, Uponor and Belkin have joined forces to create Phyn, an advanced water monitoring and leak detection system, to address our growing water availability challenges.

Consumer goods companies are taking a hard look at ways we can tackle our global plastic waste plague. Procter & Gamble, for example, is developing shampoo bottles that utilize recycled plastic harvested from beaches littered with waste.

The building sector boasts plenty of Eco-Leaders. Ingersoll Rand-one of our perennial Eco-Leader selections-has shown the industry how to optimize sustainable operations and supply chain management. The company is now leading the charge with respect to the circular economy. Ingersoll Rand has reduced greenhouse gas emissions by 45 percent

since 2013—two years earlier than its originally stated goal—and increased energy efficiency by 23 percent, water conservation by 38 percent, and renewable energy use by 32 percent.

Owens Corning recently adopted a revised definition of sustainability: meeting the needs of the present while leaving the world a better place for the future. After attaining a 49 percent reduction in greenhouse gas emissions, the company is developing a plan to become net-positive by 2030 through a number of sciencebased initiatives, including utilizing 100 percent wind-power-

www.greenbuildermedia.com



generated electricity, supporting communities throughout the globe where employees live, and working to eliminate jobsite injuries and lifestyle-induced disease.

In the furniture sector, Room & Board is expanding its use of reclaimed wood, planting self-sustaining urban meadows, and supporting American artisans to reduce the environmental impact of overseas shipping and transportation.

Even fossil fuel companies are getting in on the action. Oil



for impact, acknowledging that climate change could substantially alter their business operations and negatively affect their profitability. Disruption of supply chains due to extreme weather and operating restrictions resulting from water shortages are the two concerns that top the list.

Let's hope that the heavy lifting currently being done by corporations today will provide the baseline that we need to bolster our economy and prepare us for the inevitable changes that will come as planet continues to transform. GB

July/August 2019 GREEN BUILDER 17

7/30/2019 1:46:10 PM

behemoth Royal Dutch Shell and mining giant Glencore have recently invested in new energy divisions and set environmental targets for the first time in their operating histories.

DEAD END AHEAD?

Companies aren't embracing sustainability simply because they feel philanthropic. Rather, they see the writing on the wall: At some point, they will need to shift their business models, strand their fossil fuel assets and make a serious course correction in order to remain in business, as governments around the world set ever-ratcheting policy to cut greenhouse gas emissions.

Furthermore, regulators and shareholders alike are demanding that companies reveal climate change-related risks. A recent wave of corporate disclosures confirm that companies in all sectors of the economy are bracing



Sun rise. Solar is a big part of Bosch's effort to be carbon neutral by 2020, such as at its plant in Nashik, India, where photovoltaic panels supply 20 percent of the city's needs, with an ultimate goal of 50 percent.



Invented for life. With its wide-ranging field of home technology, mobility and business trade products, Bosch is positioned to have a major impact on all lifestyles in the next 10 years.



Day tripper. The Bosch eBike System combines lithion-ion technology with an average rider's desire for easier, greener travel—a way of saving gas without getting gassed.

www.greenbuildermedia.com

Bosch

From smart appliances to synthetic fuels, sustainability efforts are a renewable thing.

OSCH, IT SEEMS, has its water (currently at 6.3 percent lower from hands in everything. The 2015); conducting 1,000 environmental and green building industry knows safety audit from 2010 to 2020 (only 138 more to go); and having 40 percent of its the company for its smart appliances, smart sensors and power consumption sustained by renewable energy-efficient power tools. The public energy such as solar and wind by 2030. enjoys catchy products, such as electric Being so close to reaching bikes and synthetic fuels. There are current goals, Bosch has established programs that enable consumers to rent another half-dozen for the next six years. Known as "New Dimensionspower-smart appliances, a home delivery service where riders on e-cargo bikes pick Sustainability 2025," the campaign sets up recycling, a paperless electronics plant, "megatrends" targets for climate (via longa sensor program that tells farmers when term supply agreements with only green they can apply pesticides to their crops, and energy providers and purchases of highquality, "Gold Standard" CO2 certificates), more. What else is there for the technology energy (behind a \$1.14 billion promotional services giant to do? According to CEO and Chairman Volkmar and public education effort), water (25 percent reduction in extremely water-Denner, plenty. The company's goals in the next few years stem from some of its scarce areas, such as Brazil and India), current accomplishments. Those include urbanization (with additional emphasis on reaching carbon neutral status by 2020—the reducing hazardous waste and increasing its greenhouse gasses the company produces material recycling rate), globalization (such has already dropped by 31.1 percent as by more clearly identifying the ecological compared to 2007, with a target of 35 and social risks in its supplier network) and health (such as protecting people and the percent by end of next year; dropping waste production by 6.9 percent (already down 3.5 environment by ensuring that banned or percent from 2015); using 6.9 percent less hazardous substances).



www.greenbuildermedia.com

18 GREEN BUILDER July/August 2019





"We see supporting the goals of the Paris Agreement as our responsibility, and we aim to do this with sustainable products, and, above all, by taking immediate action ourselves." Volkmar Denner. CEO/Chairman of the **Board of Management**

World greeters. Bosch's green strategy for the next decade is a combination of lifestyle trends and resource management



Playing it smart. From automated sensors that detect deadly gas leaks, to self-driving robots that can improve production on an assembly line and prevent workplace injuries, LG is looking to the future to improve the present.





Circular thinking. LG's efforts toward Passive House promotion sometimes takes unusual turns, such as with this plant tube, designed to help grow more than 1,000 plants to clean carbon emissions from the air.

www.greenbuildermedia.com

LG Electronics For this technology giant, it's all about thinking smart.

T FIRST, IT'S an odd-looking thing: a rectangular, almost And all those plants? Their duty is to "Tiny Home" with a curved help clear the air of CO₂ emissions. These fence on its roof, a couple sloped few dozen bushes, vines and young trees patios outside, and a statuesque will eventually have hundreds of friends. horizontal tube out back that looks like an It's an effort that meshes with LG's recently unfinished tunnel. But then you see the solar announced goal of going carbon neutral by panels on the porch, the electric charging 2030—cutting emissions from 2 million station on one pillar, and the plants-lots of tons in 2017 to 960,000 in 13 years—largely tiny plants—growing all over the backyard. through expanded solar energy-driven It's LG's way of mingling one type of green installations and LG's own technology, such with another. This passive house-a.k.a. as its energy management systems.

Passivhaus—is a company showcase, filled This, and a consumer-oriented with products designed to grant a sustainable campaign—"Life's Good—Experience lifestyle without sacrificing comfort. The Happiness," designed to teach sustainable solar panels power the charger, the A/C, the thinking to 5.5 million young adults by heat pump. Advanced technology tracks 2021—has people noticing. In 2019, LG the energy consumption of each connected Electronics received 2019 Edison Award in device—TV, monitors, washing machine, the Energy & Sustainability category for its ultra-efficient air conditioning technology, smart speaker and refrigerator-in real time and automatically supplies the ideal and the NAB Leadership Foundation's amount of electricity, conserving power Corporate Leadership Award for the and the planet's resources. Residents also company's environmental sustainability, have the convenience of voice control via social impact, employee volunteerism and Google Assistant, enabling them to control disaster relief efforts.



for people, energy and resources.

www.greenbuildermedia.com

20 GREEN BUILDER July/August 2019

the lights, oven, blinds and more.

Game plan. LG Electronics has a three-part strategy to securing its status as an Eco-Leader, setting goals





"We look for ways to open up various business opportunities, such as an Al platform that evolves according to the needs of users, and setting up an open ecosystem for webOS. We will strive to find new opportunities in the rapidly changing business environment and become a sustainable company." II Pyung Park, President/ Chief Technology Officer



Charging ahead. By 2025, HVAC giant Rheem Manufacturing wants to lead by ultimate example—which is why it's now getting aggressive with its sustainability goals



Test case. The Fort Smith, Ark., production facility is the testing ground for an effort to reduce use of plastic, excessive packaging and waste to landfill—an approach that will be rolled out worldwide by 2025.



Future world. By the mid-2020s, an estimated 250,000 plumbers and contractors will be trained on use of sustainable products, sustainable installation and recycling best practices—a goal Rheem considers extremely achievable

www.greenbuildermedia.com

Rheem

Manufacturing If all goes according to plan, 'Good' things will soon turn out great for the environment.

HERE'S GOOD FOR one, and there's good for all. By opting for a "Greater Degree of Good," Rheem is wholeheartedly embracing the latter. In early 2019, the heating and cooling products giant launched the GDG campaign to get everyone's mind on sustainability, whether it's from improved innovation, better efficiency or stronger leadership.

Not that the company lacked in these installation and recycling best practices. areas. Rheem's sustainability numbers Meanwhile, the company will continue already showed great progress in green producing its line of award-winning enviroleadership: 134 million gallons of water friendly goods, such as tankless water heaters, saved annually at its various factories, smart thermostats, furnaces, air conditioners enough for 500,000 eight-ounce drinks and more, according to CEO Chris Peel. at just one of its production facilities; "We all feel a shared responsibility to 2.5 million fewer pounds of air conditioning reduce the natural resources required to packing materials used company-wide make and use our products, and we are each year; and 195 million fewer kilowatts excited about the opportunity to effect consumed at its Mexico facilities. Rheem positive environmental change through hopes to improve on those totals as it strives these purposeful actions," Chris Peel says. for drastically reduced emissions and landfill "By working together—Rheem associates, waste numbers by 2025. our contractors and consumers-we will create a Greater Degree of Good."

GDG takes a three-prong approach:



www.greenbuildermedia.com

22 GREEN BUILDER July/August 2019

Within five years it hopes to have firmly in place a line of heating, cooling and water heating products that boast a 50 percent reduction in greenhouse gas footprint. This in turn will help Rheem achieve zero waste going to landfill at its global manufacturing operations. The company also plans to train 250,000 plumbers and contractors about one-third of the overall industryon sustainable products or sustainable





"Sustainable thinking is embedded in everything we do. It's in our products, processes and in the way our people think and act. I'm very confident that the team will achieve these goals and truly make a difference." Chris Peel. President/CEO

Mass appeal.

Rheem's "Greater Degree of Good" campaign challenges consumers, builders and even its own employees to up the ante when it comes to going green.



New look coming. More than 1.5 billion plastic bags are turned into eco-friendly, wood-alternative outdoor living products.



Making things happen. Trex's manufacturing technique for its decking and railing products keeps the company at the forefront of the green building industry.

24 GREEN BUILDER July/August 2019



Team effort. Each year, thousands of students participate in Trex's Plastic Film Recycling Challenge, designed to teach people how to dispose of waste plastic.

www.greenbuildermedia.com

Trex

This company's specialty is putting plastic back to work.

OR MORE THAN TWO DECADES, Trex also buys unwanted waste plastic Trex has turned detrimental waste from businesses through its Commercial plastic into something useful. The Recycling Partnerships program. Procompany innovatively recycles recycling literature is freely distributed. the material by including it in its The company's annual report highlights composite decking and railing products—a how its products result in 36 percent fewer fact it shares to help people think green. greenhouse gas emissions, 47 percent fewer The company keeps more than 500 air pollutants, 84 percent less acidification, million pounds of plastic film and reclaimed 53 percent less smog and 93 percent less wood out of landfills each year, recycling ecological toxicity. The company is taking them into eco-friendly decking and outdoor steps to keep things clean inside as well. Energy-saving initiatives, such as variableliving products that are more Earth-friendly than real wood. Its high-end decking is speed equipment, heat exchangers to reuse 95 percent recycled material, which CEO Jim heat, and new lighting systems controlled Cline views as a sign of "sustainability in by motion sensors are in place at Trex our DNA." plants. A water conservation project Trex gets the good word out. An annual is nearing completion at its plant in Plastic Film Recycling Challenge draws Virginia, as are efforts to use GPS systems thousands of kids from hundreds of to optimize warehouse operations, and use rail lines for shipping instead of trucks. schools, all trying to prove they're the best at gathering and properly disposing of plastic A longer-range—and more challenging goal is for Trex to find a way to recycle shopping bags, bread bags, case overwrap, or reuse its decking, for which no options bubble wrap and more. A similar program exists for colleges and local communities. currently exist.



www.greenbuildermedia.com

ECO-LEADERS Green Builder[®] Me

All wrapped up. As public opinion of single-use plastics sours, companies like Trex have taken the initiative to encourage recycling among consumers and retailers

July/August 2019 GREEN BUILDER 25



"Our adherence to our company's core values continues to resonate with customers-both contractors and consumers-who understand the importance of environmentally conscious building." Jim Cline, President/CEO



"Whirl'd" leader. While the public's view of the environment has changed a lot in the past 50 years, Whirlpool's still doing what it did in 1969: finding the best ways to go green.



Seafaring sustainability. A plastic reclamation project in the UK and Italy could mean removal of thousands of pounds of waste materials each year from Atlantic waters.



A habit of helping. Whirlpool continues to support Habitat for Humanity's affordable homes projects by supplying energy-efficient appliances and almost \$107 million in commitments over two decades.

www.greenbuildermedia.com

Whirlpool Corporation Even after half a century, new green frontiers

are still being reached.

HEN WHIRLPOOL BEGAN Whirlpool's green presence is being integrating sustainability into its operations, Richard felt outside the workplace as well. The company is using automated *Seabins* along Nixon was president, mankind was about to the coasts of the United Kingdom and Italy to collect 3.3 pounds of waste plastic out conquer the moon and "going green" had a very different, politically incorrect meaning. of local water per bin each day, primarily Fifty years later, the home appliance giant in the form of shopping bags and beverage is still finding ways to make employees, bottles. A successful run could bring the retailers and the public pay attention to the tool stateside. The company has over the past two decades donated nearly 200,000 environment The company follows a "three Ps" green energy-efficient appliances to Habitat for strategy: Sustainable Plants, which includes Humanity for the organization's affordable efforts such as the prioritizing and tracking homes projects. And the ReNEWW House, of efficiency improvements-which helped Whirlpool's live-in research laboratory at cut greenhouse gas emissions by 7 percent Purdue University, continues to develop from 2017 to 2018, the equivalent of 10,000 ideas on how consumers, their homes, homes' electricity use annually; Sustainable systems, appliances and the grid can work together in a more environmentally Products, such as a new global emissions management system, which unifies 12 responsible fashion.

footprint-measuring methods into one global reporting capability; and Sustainable Practices, which includes water reduction processes and technology to cut consumption by nearly 10 percent from 2017 to 2018 in the company's manufacturing facilities. That's enough to run 56 million dishwasher loads



www.greenbuildermedia.com

26 GREEN BUILDER July/August 2019



or fill 240 Olympic swimming pools.

It's a tall order, but nothing that Whirlpool can't handle, according to CEO Marc Bitzer. "At Whirlpool, we believe in doing the right thing, because there's no right way to do a wrong thing," he says. "Doing the right thing compels us to embrace sustainability in all its dimensions."





"Successful and vibrant communities are the foundation of a great business. That's why Whirlpool is committed to maintaining strong connections in our communities and being a leader in social responsibility and volunteerism." Marc Bitzer, CEO/ Chairman

The three Ps. Whirlpool's sustainability strategy centers upon how to get things done, where it happens and what the end result should be.



A lofty goal. 3DS technology helped operators of Solar Impulse design a plane capable of flying around the world without using fuel.



Sight seeing. Virtual reality is transforming from a recreational tool for individuals to a full-spectrum experience involving dozens of people simultaneously.



Virtual road map. Dassault Systèmes' offerings include holistic, virtual models of past and present cities, which help builders understand what may and may not work with sustainable planning.

www.greenbuildermedia.com

Dassault **Systèmes**

Sustainable thinking and technology are becoming partners in the 'Industrial Renaissance.'

ERNARD CHARLÈS HAS exemplify the kind of thinking needed to two words for what he sees keep up with an ever more tech-dependent happening with world business: society. "Industrial Renaissance." The Dassault practices what it preaches, using CEO of Vélizy-Villacoublay, its 3DS technology to sustainably design its France-based, believes that to succeed in North American headquarters in 2011. The the coming decades, people will need to go 27-acre campus includes more than 2,000 beyond "thinking outside the box." They're tons of recycled steel, and 61,000 tons of going to have to rethink the box. structural materials were reused as fill. The Dassault, the "3DEXPERIENCE Com-HVAC units use a chemical-free electrostatic pany," provides companies with virtual water treatment unit instead of chlorine. reality-type solutions to everyday prob-Overall energy use is reduced by 29 percent lems, such as a more aerodynamic and through a combination of high-efficiency fuel-efficient automobile or more-durable rooftop HVAC units and boilers. Its design wind turbines. There are also real chalawards include LEED Gold certification. In 2018, the French company was named lenges—just ask about Solar Impulse, the "Most Sustainable Company in the World" plane powered only by the sun, which flew by the Corporate Knights Global 100 Index, around the world in 2016 without using a drop of fuel. Or the digital twin of the considered the gold standard for corporate

French city of Rennes, that fully depicts sustainability analysis. its architectural layout and infrastructure, "Tomorrow's game-changers will not be giving architects and planners a chance to those with the most automated production figure out how it needs to be redesigned to systems," Charlès says. "[Instead, it's] those fully provide water, clean air and electricwho build a culture of knowledge and knowity to a growing population. These simulahow to reveal and train the workforce of tions are by no means simple-some, at the future, able to solve the challenges of a first, called them impossible—but they planet lacking sustainable solutions."



www.greenbuildermedia.com

28 GREEN BUILDER July/August 2019

Industry Renaissance.

Technology's multi-faceted grip upon society means companies must take new approaches to challenges such as climate change or risk being seen as outdated, according to Dassault Systèmes CEO Bernard Charlès.





"We can no longer see the world merely as an object. To create a sustainable world, we cannot simply carry on as we do today. A sustainable world calls for more imagination and innovation in science, uses and economic models." Bernard Charlès, CEO/ Vice Chairman



Megawatt mega-walk. Some of Invenergy's projects are quite sizeable, such as the Grand Ridge Solar Farm near Streator, III., the largest solar farm in the Midwest when it was built in 2012.

Invenerov Impact



Well-structured success. Invenergy's Lackawanna Energy Center in Jessup, Pa., recently received LEED Gold certification for its design, which is 60 percent more efficient than similar buildings.



Starting a "mooovement." The cover to Invenergy's 2018 sustainability report succeeded in multiple ways: It drew attention to alternative energy, revealed that the company had a sense of humor and made more people want to read the report.

www.greenbuildermedia.com

Invenergy Sometimes, success comes in all forms-even from

those with four legs.

T WAS THE photo that caused a mini cut down on printing and helped the sensation last year: A picture of four company slice paper costs nearly in halfcows on grazing land, with a windmill despite a 7 percent increase in number of in the background. An invite on the Invenergy employees. company's Instagram page asks Invenergy also pursues renewable energy visitors to "join the mooovement." It was the most-liked photo on that page for all of 2018. The company? Invenergy. The reference?

The company's efforts at developing and storing renewable energy for clients worldwide. It's a cause the Chicago-based green power giant had fun promoting when it grabbed the pic for its *Invenergy* Impact: 2018 Sustainability Report. But then, Invenergy often takes a slightly longer look to see if there's a different, better way to complete a project.

There's the Miami Wind Energy Center in Northern Texas, where employees made raised garden beds from used old gearbox oil containers. Invenergy's relocated downtown Denver branch suddenly became the place advancing innovative renewable and clean where employees biked to work instead of energy technologies," CEO Michael Polsky driving, which all of them did previously. says. "It's about environmental stewardship, The switch to Workday and Oracle, two community investment and empowering cloud-based administrative software tools, people."



www.greenbuildermedia.com

30 GREEN BUILDER July/August 2019

projects in small rural communities, because it gives the younger generation a chance to work and stay in the town where they grew up, instead of moving away. It has invested \$160 million in home communities to help stabilize the local economies by providing jobs and additional tax revenue.

Of course, there are the environmental benefits. Invenergy projects in 2018 offset an additional 14 million tons of carbon dioxide emissions, the equivalent of planting 300 million trees or taking 500,000 cars off the road. All told, there are now more than 22,600 megawatts of projects in operation, under construction or contracted worldwide. "Sustainability is about more than just





"I am an engineer and an entrepreneur, not an environmentalist or a social activist. But I do what makes sense. Sustainability just makes sense." Michael Polsky, CEO

Fact finders. When it comes to revealing what Invenergy is about, these notes say it all.



Higher purpose. Neste specializes in alternative fuels for transport, business and consumer needs, but it also wants to take the lead in educating the public about climate change.



Crude venture. Neste officials are meeting with counterparts in Southeast Asia to discuss ways to develop sustainably sourced palm oil instead of clearcutting.

32 GREEN BUILDER July/August 2019



Alternative thinking. After a string of successful alternative fuel ventures, research continues in the effort to find the next big breakthrough.

www.greenbuildermedia.com

Neste

By offering low-emission fuels to replace fossils, this firm is cleaning up the transition to renewables.

N THE PAST 20 YEARS, Neste has to alternative fuel use several years ago, and made a name as the alternative fuel the company's target of preventing 9 million company. The Finnish corporation tons of GHGs by 2022 is well in sight. But specializes in renewable and low-Vanacker knows fighting climate change is emission options to diesel and crude not a solo act. oil-based consumables, instead powering "Combating climate change is everyone's vehicles, planes and factories with product business," he says. "We can create a safer and derived from such exotics as vegetable oil, more resilient future and leave a healthier corn oil residue, and animal and fish fats. planet for our children when we work Its efforts have placed it on the renowned together to readdress how we produce and Corporate Knights Global 100 Index of consume energy, food and water, and how World's Most Sustainable Companies a we safeguard the world's oceans and forests." record 13 times, including spots at Nos. 2 That's how an effort to make Lidö Island and 3, respectively, in 2018 and 2019. in the Swedish Archipelago fossil-free in one

year began, to see how fast it could be done For many companies, that would be enough. But Neste has another reason for in a populated area. The total dropped by continuing to expand research on cleaner 78 percent, which Neste considers a huge fuels: It's getting hot. CEO Peter Vanacker is success. In 2018, the company began meeting aware of the discussion and near-panic over with authorities in Southeast Asia to help the Paris Agreement and its 2050 deadline them shift toward sustainably produced for greenhouse gas emissions (GHGs) to palm oil. And the same year, Finland's be net zero in order to prevent irreversible Plastics Roadmap, the first of its kind in the damage from climate change. Neste is doing world, mapped a path to chemical recycling its part: All of its factories were converted of plastic waste.



www.greenbuildermedia.com

2019 ECO-LEADERS Green Builder[•] Media



"The climate challenge is indeed staggering...the outlook surrounding this challenge, however, should be one of hope, not fear. After all, when passion and optimism are turned into action, the results can be considerable." Peter Vanacker, President/CEO

Thinking ahead. Neste consistently attempts to reduce its environmental impacts.



Photo(voltaic) finish. Toyota North America's headquarters has more than 20,000 solar panels that generate almost one-third of the power it needs to function



Well-framed. A design improvement method has led to a 24,000-pound reduction in materials needed during automobile assembly.



Simple science. Toyota's new hydrogen-based, compacted SimpleFuel system can store in smaller spaces, making it usable with fuel-cell forklifts in assembly plants.

www.greenbuildermedia.com

Toyota Motor Corporation This automaker's lofty goal: reducing the life cycle

impacts of vehicles.

ALL IT THE "Four Good Groups." Many companies have set green goals for 2030 or even 2050 that take primarily one proenvironmental action. Toyota North America spreads it out and has four key focus areas as it heads into the 2020s: carbon, water, materials and biodiversity. There's an 8.79-megawatt solar system in place at its headquarters in Plano, Texas, that will power nearly one-third of the plant and prevent nearly 7,200 metric tons of carbon dioxide emissions. The company co-sponsors the National Mayor's Challenge for Water Conservation, which helps raise the nation's collective I.Q. about water use. A team at its Indiana assembly plant discovered 23 areas on the Toyota *Sienna's* underbody where manual PVC a work in progress.

Toyota North America's actions are part of the overall corporation's "Toyota Environmental Challenge 2050," six goals designed to make the automotive giant an example of green business management by mid-century. The challenges—cutting average new automobile CO₂ emissions by 90 percent from 2010 levels; eliminating all CO₂ emissions from the vehicle's life cycle; achieving zero carbon emissions at all plants worldwide; minimizing water usage and implement water discharge management based on local conditions; promoting global deployment of end-of-life vehicle treatment and recycling technologies; and connecting its nature conservation activities with those of other companies and communities—are "Nothing about Challenge 2050 is simple, spraying could be reduced or eliminated, cutting raw material use by 12 tons. And except the reasoning behind it," notes Kevin Toyota's Woodstock assembly plant in Butt, director of sustainability for Toyota Ontario, British Columbia, established a North America. "We know that our futurewetlands walking trail to give the local our health and well-being-depends on clean air, clean water and diversity in nature community a chance to experience nature firsthand. As CEO Jim Lentz puts it, the to provide us with medicines and other ultimate goal is to "create a positive impact ecosystem services."



www.greenbuildermedia.com

34 GREEN BUILDER July/August 2019

on the planet and society."

ENVIRONMENTAL CHALLENGE 2050

Challenge accepted. In response to public opinion and its own pro-environmental goals, Toyota formulated six green challenges ranging from reduced carbon emissions to better harmony with nature.





"Across Toyota, we've pledged to create a net-positive impact on society and the planet by 2050. By net positive, we mean going beyond just eliminating our negative impact, to helping create widespread, meaningful change." Jim Lentz, CEO, Toyota

Motor North America



A different view. Even though it's responsible for many of society's most common products, Unilever likes to do some things differently—as its headquarters in Rotterdam, Netherlands, clearly shows.



Forest savior. Unilever, which uses only sustainably sourced plant-based resources, has taken a strong anti-deforestation stance.

36 GREEN BUILDER July/August 2019

Unilever

With its carefully controlled supply chain, Unilever is setting new industry standards.

I'S NOT OFTEN that a company will safe, high-quality reusable polymers; a new take an action that is harmful to its waste-free shopping and delivery pilot in business, but executives at Unilever did which products are shipped to consumers, just that in 2010, when the company then returned and refilled; a toilet spray opted to make deforestation one of its that disinfects and eliminates odors without top three transformational goals for the end the need to flush; and even a television of the decade. One of the key products derived commercial campaign about the merits of from destruction of rainforests is palm oil, a handwashing that has helped reduce the key ingredient in some of what the Dutch spread of germs in developing nations. Unilever was also a key player in the creation of the UN Sustainable Development Goals (SDGs), a 17-point world improvement action plan set for 2030. Acknowledged by more than 170 nations, the goals range from the end of poverty and hunger, to

company sells to consumers. Unilever's supply chain is entirely of sustainable origin, but the commodities that drive deforestation "will continue to be stigmatized in ways that will negatively affect us," according to CEO Alan Jope. The consumer goods giant oversees global green partnerships. Unilever's own brands such as Dove, Lipton, Knorr, Surf, Sustainable Living Plan was a precursor to SDG and is still the company's blueprint Best Foods and Ben & Jerry's, to name a few. An estimated 2.5 billion people use for sustainable growth. "We don't pretend something tied to Unilever, which gives it it will be easy," Jope says. "Change never is. insight into what consumers like, don't like, Nor do we claim to have arrived there yet. need and don't have. But we are on the journey, and we hope that That's what has led to recent efforts, such many other companies will also seize the

as technology that recycles sachets into opportunities that the SDGs present."

MPROVING HEALTH AND WELL-BEING FOR MORE THAN 1 BILLION		REDUCII ENVIROI IMPACT HALF
By 2020 we will help more than a billion peopl action to improve their health and well-being.	e take By 2 of th busi	030 our goal e making and ness."
> Explore our big goal	> E:	kplore our b
Health & hygiene	> Gree	enhouse gas
Improving nutrition	> Wat	er use
	Was	ste & packagi
	Sus	tainable sour
We are taking action on the UN Sustainab Development Goals		We are takir Developmen

environmental and professional.

ING DIMENTAL T BY F		ENHANCING LIVELIHOODS FOR MILLIONS	
I is to halve the environmental footprint Id use of our products as we grow our		By 2020 we will enhance the livelihoods of millions of people as we grow our business.	
oig goal		> Explore our big goal	
es	>	Fairness in the workplace	
	>	Opportunities for women	
ng	>	Inclusive business >	
cing	>		
ing action on the UN Sustainable nt Goals		We are taking action on the UN Sustainable Development Goals	

Multitasker. In taking a role as a world green leader, Unilever's goals for the next 10 years are existential,





"New technologies, new business models, new ways of thinking and new collaborations-they are all vital to creating the inclusive growth that will ensure a sustainable future for the world, its people and our business." Alan Jope, CEO



THE HOUSE THE EXPERTS BUILT

Green Builder[®] Media embarks on its next extraordinary demonstration project: a stunning dream house that doubles as a template for sustainable building that pros and homeowners across the nation can emulate.



38 GREEN BUILDER July/August 2019

www.greenbuildermedia.com

www.greenbuildermedia.com

BY CATI O'KEEFE

UILDERS AND ARCHITECTS design houses of all kinds in this country, but given a chance to create homes for themselves, what do you think they would build? One example is under

way right now: the personal home of Meritage Homes Vice President of Innovation C.R. Herro. The house is on a spectacular 20-acre parcel in Enumclaw, Wash., approximately 30 miles southeast of Seattle at the base of Mount Rainier National Park. The project will unite sustainable design techniques with advanced products, systems and technologies for optimized performance and wellness at a reasonable price point.

Follow Herro's house build as it progresses from the conceptual idea of recreating the feeling of his grandparents' home, through the choices made for high performance and design, and culminating with a stunning sustainable net-zero masterpiece, ready for vibrant living in spring 2020.

This show home project—the VISION House[®] Seattle Cascades—brings together the greatest minds in the building industry to redefine what it means to build green homes in today's marketplace. The home will serve as a simple, replicable application of innovative design, progressive building science and thoughtful green building, which professionals and homeowners throughout the nation can follow.

Green Builder's coverage of this show project will highlight the gamut of issues that building professionals and consumers should consider when building in today's market, including novel design approaches, advanced products, enabling technologies, efficient building systems and renewable energy.

INITIAL LEARNINGS

The goal of the project is lofty: to redefine sustainability and set a new standard for building green in the current marketplace by blending sustainability, quality, durability, intelligence and wellness with affordability.

To achieve optimal results, Green Builder and Herro gathered some of the greatest minds in the country, including internationally acclaimed sustainable architect Stace McGee and award-winning green builder Ted Clifton, along with the most innovative product manufacturer partners. (See Sponsors In the Spotlight, page 42).

Off-grid, net zero and connected, the VISION House® Seattle Cascades will feature a Panasonic solar system (with storage); a robust Control4 smart home system that will optimize performance and connect all of the lighting, devices and mechanical systems with the solar power system; radiant heating by Uponor; super-efficient windows from Western Windows Systems designed specifically for the Pacific Northwest climate; stone-coated steel roofing from Boral; durable manufactured stone from Cultured Stone: energy management system from Square D; highperformance fireplace glass from Schott; and resource-saving KitchenAid appliances.

The home will be off-grid with respect to water and sewer, as well as energy. "I was pleasantly surprised at how easy it was to unplug in the Seattle climate," says Herro. "Utilizing rainwater harvesting and an atmospheric generator that pulls water out of the air, I'm going to have twice as much water as the typical American home needs."

For the most part, the process has been engaging, educational and enriching. "I love this project," says Herro. "I love working with all of the manufacturer partners,





Cooking with class. The open kitchen will boast energy-efficient appliances from Whirlpool, high-efficiency windows from Western Window System, and an LED lighting package.

experts and incredible minds that we have brought together."

But, as most projects do, the VISION House[®] Seattle Cascades project experienced some unexpected setbacks, including lengthy delays in the permitting process. It doesn't matter who you are in King County—leading production builder or firsttime homebuyer—you wait in the queue. But it's important to talk about these issues and others that may cause delays or added costs, because it is what typical builders and homeowners also face when embarking on a new home project.

SIMPLE WORKS

One lesson that unfolded as the project launched is the importance of keeping things simple. "Herro's initial sketches incorporated simplicity of design and economy of scale, so it was easy to translate them into an excellent example of a modern-day high-performance, healthy home," says Stace McGee, the project's architect and founder of Environmental Dynamics, Inc. "However, all of our partners, understandably, wanted to put their best foot forward and showcase their most advanced products. To keep the home at

a reasonable price point and create something that is replicable across the country, we had to make hard choices and reduce the bells and whistles."

This made for some difficult decision making, but was important to keep the project on track-particularly with some of its out-of-the-mainstream precepts.

"Anytime you're trying to do something different, the usual systems break down in terms of permitting, contractor channels and the like, so you can't follow a normal process, which effectively doubles the cost continued on page 43

"It's not often that the opportunity comes along to redefine sustainability and set a new standard for building green in the current marketplace—to design and build a template that can be replicated across the country—but that's precisely what Green Builder® Media is aspiring to do with the next project in our VISION House* demonstration series."

Sara Gutterman, CEO. Green Builder® Media

"During the economic downturn from 2007 though 2016, I was able to take the time to conduct a lot of research on various aspects of energy-efficient home construction. During those years, we were able to test and prove our work, but only on our own projects. The VISION House[®] project offers us an opportunity to work closely with other top industry professionals in a manner we can all learn from. This project is as much about sharing knowledge as it is about building a house, not just between ourselves, but with the greater world of homebuilders and homeowners."

Ted Clifton, builder, Clifton View Homes

40 GREEN BUILDER July/August 2019

www.greenbuildermedia.com

www.greenbuildermedia.com

WHAT'S SO EXCITING ABOUT THE **VISION HOUSE® SEATTLE CASCADES?**







"It is exciting to collaborate with some of the top green building experts in the United States. Our united mission to share our knowledge regarding sustainable homes is inspiring. Hopefully, through sharing our experiences, we can encourage others to create a more sustainable built environment and a brighter future for us all."

Tadashi Shiga, energy rater, **Evergreen Certified**



"An exciting aspect of this project is that it will empower homebuyers to understand how the home works. It needs to be simple enough that they will want to monitor and interact with it. We give them what they need to change their behavior and help them understand how they can make simple changes in their lives. so that their home and lifestyle have less impact on the environment"

Stace McGee, architect. **Environmental Dynamics**



"The obvious answer is living in it! But as a member of the betterbuilding community, I am actually most excited about seeing what happens when you collaborate with the best of the best to build a singular example of how a contemporary home should be built—from the minutiae in optimizing exhaust vent runs and limiting roof penetrations, to advanced integrated load management integrating isolated, insulated thermal mass, steel roof under-venting, climate specific windows, advanced fresh air management and advanced home energy management. The bones of this home are intended to leverage resources in a way that will require new approaches to modeling, to capture the reduced and moderated loads benefits we intend in this home. But mostly, I hope this home demonstrates to all of our partners a broader value proposition that promotes a more comprehensive understanding and pursuit of responsible source utilization for a world that desperately needs it."

C.R. Herro, VP Innovation at Meritage Homes and homeowner



SPONSORS IN THE SPOTLIGHT

Here is a list of the sponsors who have made this project possible. As the year progresses, watch for detailed coverage of their products and contributions to the house.

WHIRLPOOL KitchenAid appliances

CONTROL4

whole-home control system

PANASONIC Cosmos, vent fans

PANASONIC SOLAR PV + storage

UPONOR radiant heat, fire protection, Phyn

"We're excited to be the automation partner for this VISION House[®]. The Control4 Smart Home OS provides a great opportunity to improve efficiencies around the home to live a more sustainable life through intelligent lighting, shades, thermostats and more. By allowing various devices and products to be managed under one smart home operating system, the house can automatically react according to the time of day, temperature or changing seasons, giving homeowners yet another way to maximize green living and reduce their carbon footprint." Earnest Morgan, Sr. Director of Business Partner

Programs, Control4

"It's incredibly rewarding to work on a passion project like this one, which utilizes new products and techniques from today's most innovative companies in a way that can be replicated at a large scale. Our team is excited to partner with C.R. Herro, his team and the other categoryleading brands to create something that is both sustainable and attainable for the future."

Ramsay Hawfield, Vice President of Marketing, Cultured Stone

WESTERN WINDOWS

BORAL ROOFING stone-coated steel roofing

CULTURED STONE (also a Boral company) manufactured stone for interior and exterior (part of thermal mass story for fireplace)

> SCHOTT fireplace glass

"Whirlpool is very excited to partner with Green Builder and C.R. Herro to be part of the VISION House[®] of the future. The technology in this house makes it possible to have gorgeous and functional *KitchenAid* product in the kitchen and Smart Whirlpool laundry, without sacrificing energy use."

Kelly Safis, General Manager, Builder Sales, Whirlpool

"I am really excited about the fact that a sustainable and efficient home can be built at an affordable price. Typically, sustainability and affordability don't go hand in hand, and showing that the two values can be delivered to a homebuyer will definitely force other builders and designers to rethink their current model. Additionally, we recently launched Wiser *Energy—a Fitbit* for the home—that tracks real-time energy consumption and production. Our ability to demonstrate energy savings over time and see how this home compares to other homes will be a key factor in the overall success of the project."

Ansul Rajgharia, Business Development Manager, Schneider Electric

PREMIER SIPS structural insulated panels (SIPs) for roof

NUDURA insulating concrete form (ICF) for walls

SQUARE D electrical system

MOISTURESHIELD composite decking

"We feel that MoistureShield Vision, a capped composite decking with excellent moisture resistance, is perfect for the VISION House* Seattle Cascades house and Seattle climate. The Vision line also features our innovative *CoolDeck* technology to reduce deck surface temperatures up to 35 percent. And, MoistureShield is made from 95 percent recycled content, both plastic and reclaimed wood, so it fits right into the green home narrative.

Josh Landis, Product Manager, MoistureShield, a division of Oldcastle APG



www.greenbuildermedia.com



The home boasts stunning design details, an open floor plan and innovative materials.

continued from page 40

With its high-performance building enveand time to manage the learning curve," laments Herro. "We're trying to do somelope systems, efficient mechanical systems, thing progressive and different with this self-optimizing smart technologies and project, and being on the leading edge can sustainable design features, the VISION be challenging. We want to develop a case House[®] Seattle Cascades will showcase study so that other people-including buildhow an upfront investment in efficiency ing professionals, homeowners, permitting will yield thousands of dollars in annual entities, municipalities, realtors, appraisers operating savings without any sacrifice. "This is of paramount importance," says and lenders-can feel safe following suit and moving forward with the types of prodgreen builder and building science expert ucts and systems we're using. We're trying Ted Clifton, "because we need to help homeowners understand the true value of their to normalize advanced green building and design practices. That has been both a burhome investment. What is the rate of return den and a joy, but I'm grateful for the ability in reducing operating costs versus other to participate." types of investment? Does an investment

www.greenbuildermedia.com

It's a living (room). The sleek aesthetic reflects the contemporary style of Pacific Northwest, with clean lines, mixed materials and large windows.

GIVING TO GET

in efficiency outperform what you'd get in the stock market?"

In addition to exploring the true value of home investment, Green Builder will also debunk the price per square foot and lowest upfront cost valuation metrics that have been paralyzing the building industry for far too long. "These metrics are no longer valid, and they are wholly insufficient for measuring quality, performance, resilience and environmental impact," says Green Builder® Media CEO Sara Gutterman.

Stay tuned for frequent updates, articles, and videos on this ground-breaking project on the pages of this magazine, as well as on the project's website. GB



Actively addressing Orlando's lack of affordable housing, a new 58-unit project sets out to prove that affordability and sustainability can co-exist.



environmental footprint.

BY BARBARA HORWITZ-BENNETT

ANKING THIRD NATIONALLY in lack of housing for extremely low-income residents, Metro Orlando offers only 18 rentals for every 100 families in deep poverty, according to a recent National Low Income Housing Coalition study.

Looking to rectify this, the Village of Orlando, Inc. and City of Orlando have rehabilitated close to 200 units, including a new 58-unit sustainable rehabilitation of an existing apartment complex—New Horizons-in the city's Washington Shores district.

But what's unique about this project is its quest to prove that affordability and sustainability can co-exist. As such, the New Horizons project showcases a number of green technologies, most notably a 52-kW rooftop solar array, providing close to 1 kW per resident.

"The New Horizons project is expected to serve as a demonstration to developers and the community that affordable housing and green initiatives—including solar, edible gardening, waste recycling and general energy reduction efforts-can be done where all stakeholders can benefit," reports Charles A. Rowe, development director for the Village of Orlando, Inc.

www.greenbuildermedia.com

On the Horizon(s). The New Horizons project includes a 52-kW rooftop solar array to lower utility bills for each apartment unit and reduce its

Chris Castro, director of sustainability for the City of Orlando, agrees. "The New Horizons project presents a showcase model for how low-income housing could incorporate sustainability features within the same project budget in an effort to lower monthly expenses, reduce environmental impacts, and enhance the quality of life for the residents," he says.

PROMINENT PARTS

In addition to aforementioned features, the units include ductless HVAC systems, high-efficiency water heaters, ENERGY STAR appliances, R-19/R-30 insulation values, low-flow fixtures and faucets, LED lighting, Florida-native landscaping, a community garden and rain barrels.

The ductless HVAC systems are a three-head wall-mounted minisplit arrangement in each bedroom and living room. "This allows the occupant to compartmentalize the systems efforts, which affords the user to manage consumption by focusing usage in areas of the home, based on need," explains Rowe.

These high-efficiency units are rated at 14 SEER, incorporate programmable thermostat in each unit, which provide modes for



Priced right. Among the first of 20 affordable single-family residences is this house model in Orlando's Parramore community, which comes complete with sustainable products, such as energy-efficient appliances, low-flow water fixtures and hookup for solar arrays.



dehumidifying, fan, heat and cooling.

In terms of the building enclosure, the project is a slab-on-grade concrete block structure with block construction for the interior wall partitions. Utilizing core injection methodology, insulation is injected into the concrete block voids to achieve those above-code R-19/R-30 insulation levels. For the attic spaces, blow insulation was utilized to boost performance and exceed the code.

The upshot is "improved indoor comfort of the units, more of a sound barrier between units, and better climate control to maximize energy efficiency," reports Castro.

Addressing water efficiency, the low-flow fixtures and faucets' reduction of water consumption is yielding as much as 50 percent savings on water bills.

As for the PV system, three rooftop panels are working to produce close to 100,000 kWh per year, which means up to a 40 percent reduction and a \$20 saving in monthly energy bills.

THE BIG PICTURE

Also serving as an example of urban renewal, this particular site was formerly abandoned, derelict and surrounded by barbed wire on a well-traveled street corner, essentially projecting an image of despair and isolation. Now, by turning the site into a new, sustainable housing complex, the community has received a boost of morale.

"We hope this project sets a precedent for the type of affordable and sustainable housing standards that other develops build to," adds Castro.

Granted, New Horizons is not the only affordable housing initiative in town.

In the lower-income Parramore neighborhood just west of downtown, the City is building 20 new single-family residential homes. Available at below-market rates, the homes are incorporating sustainable features, such as locally sourced building materials, sustainable

www.greenbuildermedia.com

rehabilitation of an existing 58-unit apartment complex in Orlando's affordable housing available to more Florida residents.



materials promoting good IAQ, energy-efficient appliances, low-flow water fixtures and possibly solar arrays.

Another City enterprise is its Property Assessed Clean Energy program, which gave \$1.5 million in loans to approximately 80 projects for clean energy home improvement in 2017 and is making \$5 million available to City of Orlando businesses and residents this year, with favorable rates and terms for low-moderate income households.

Similarly, the City's Solar Energy Loan Fund (SELF) offers favorable financing to low- and moderate-income families, helping to address that cost barrier for investing in solar.

SOLAR AND MORE SOLAR

Actually, the SELF project is one of several solar programs which earned the City of Orlando a SolSmart GOLD distinction from the U.S. Department of Energy in 2018, for its efforts to support and encourage city-wide solar projects.

By streamlining the solar permitting process; training planning, permitting and inspectors on the solar process; and creating new Solar Permit guidelines, this is effectively reducing the soft costs of going solar and making the process much easier.

Another solar initiative is a bulk purchasing aggregation program run by the Orlando Utilities Commission (OUC). By joining together with other homeowners in OUC territory, residential solar

www.greenbuildermedia.com

installation costs are reduced by 20 percent to 30 percent.

The purchasing program is similar to buying in bulk at Costco, as opposed to your local grocery store, Castro explains. This buying power helps achieve an economy of sale that is much more cost effective. In particular, homeowners are reducing their \$3.50 per watt installed costs to \$2.40 per watt installed. "This is substantial, amounting to \$5,000 to \$7,000 savings," he reports.

At this point, there are currently 30 such co-ops in the State—and to Castro's knowledge, Florida is the only state with a utility offering such a program.

Another OUC initiative is Community Solar, which has made 20-plus MW of solar available to residents and homeowners who are interested in photovoltaics, but don't have suitable rooftop access to build their own systems. This way, up to 100 percent of their home's electrical bills can be offset with solar.

AFFORDABLE HOUSING PRIORITY

Tying things back to the issue of affordable housing, the City's focus is very much on projects like New Horizons and Parramore to ultimately provide more affordable housing options for Orlando residents.

"In the face of a rising need for safe, decent and affordable rental housing, we continue to search for ways and means to expand the community's stock of attainable units," Rowe says. GB



SMART APPLIANCES COME OF AGE: Selling Timesaving Tech to Busy Buyers

Connected home technology, used properly, can save time for what really matters.

BY MATT POWER

ONNECTED APPLIANCES HAVE MATURED in recent years. No longer pitched as simply a way to control your oven on your way home from work, their value as potential time and labor reducers has entered the conversation. That's smart. Saving time is the Holy Grail of almost any new technology today. But to convincingly make the argument that technology will save time, you have to factor in human behavior and include that variable as part of the consumer's education. Tech can take on common chores, yes, but only if used thoughtfully—a fact that many fail to acknowledge.

For example, just because an automobile moves us from Point A to Point B faster doesn't mean it is "saving" us time. Chances are, if we had to ride in a horse and buggy the same distance, we would make the commute a lot less frequently, and spend fewer hours overall on the road. The same is true of washing clothes. If we're repeatedly loading and unloading washers and dryers all week, our Victorian ancestors who washed only on Tuesdays have us beat.

Key, then, is putting our connected devices in their proper place in our lives. For example, an intuitive washer that alerts a user by smartphone when a load of wash is sitting damp in the machine saves the time of running another load later than planned.

The real "quantum shift" in smart home tech is underway—a move from the foreground to the background of our lives. As connected tech in the home evolves from novelty to invisible helper, the brands and products that flourish will genuinely free up time for things people actually care about.

www.greenbuildermedia.com

MINUTES TO SPARE

What do most Americans do all day? The data doesn't tend to vary much from a 2016 Wall Street Journal survey on the topic. Those who are employed work about eight hours a day, sleep about nine hours a day, watch TV for seven hours and 50 minutes daily, and squeeze in housework, childcare and other household activities around that "big three."

Presumably, they're doing all of those things with the TV, or YouTube, or Netflix blaring in the background. If you doubt that TV-watching statistic, keep in mind that most North Americans spend an astounding **90 percent** of their lives indoors.

So where does connected living enter this picture? In the background, naturally.

To illustrate, let's look at time management in a connected kitchen. Kitchens are home to three timeconsuming tasks: meal planning, grocery shopping and meal preparation/cooking. But the right technology can shave precious minutes from these mundane tasks, better used to buy back time for playing with children, calling a distant parent, meditating or going for bike ride. Here's how:

MEAL PLANNING. Americans eat the fastest of Stocked. A key timesaver in the kitchen is the ability to re-order via connected appliances like most industrial nations, and studies have shown that this Samsung fridge, and to make more-efficient use of leftovers. the less time they spend on meal planning, the more fast food and low-quality food they consume. But does it have of Americans. This is where connected appliances enter the picture. to be this way? Not necessarily. Many timesaving apps, such For example, some smart refrigerators now contain recipe planners as Mealime and Big Oven, offer a free assist for planning and that take into account what's actually inside the fridge, including purchasing meals. The better ones also account for vegetarian, age and expiration dates. Some even offer recipe suggestions. Food vegan and other special diets. saved. Time saved. Money saved.

Of course, another impromptu phase of meal planning involves leftovers. Dealing with partially consumed dishes also matters in the big picture. It's key to reducing the huge food-waste footprint



www.greenbuildermedia.com

48 GREEN BUILDER July/August 2019

www.greenbuildermedia.com/internet-of-things-central



ONLINE SHOPPING. Surveys show that most Americans dislike grocery shopping. It's a necessary evil, not a fun outing. And most people spend a lot of time doing it. For example, the Time Use Institute

Breaking and Delivering?

Walmart recently launched a new service where it sends an employee to personally restock your refrigerator, even while you're away. Workers access the house via electronic locks. The verdict on whether people will feel comfortable with this level of interaction remains to be seen.

notes that the average shopping trip takes 41 minutes. If you multiply that by the 1.5-trip-per-week average, that's more than 53 hours per year you're spending in the grocery store. To put that in perspective, studies suggest that American families only spend about 37 minutes of "quality time" together per day. So when they do shop, they spend more time at the store than they do with family on a typical day.

It's no wonder that, that after several years on the decline, online shopping for groceries is coming back, albeit selectively. It's a market with clear appeal to those short on time. As Supermarket News reports, "services like Peapod, Instacart, Shipt and AmazonFresh that cut out the trip to the grocery store appeal mainly to those short on time: parents with children younger than age 18, and employed adults." The article also notes that higher-income Americans are bigger adopters of grocery delivery, either because higher income means they can afford more groceries, or they have greater access to mobile technology-such as smartphones and tablets-that make ordering online easier.

TIME SAVER. Into this growing market come connected devices especially refrigerators-with built-in barcode scanners, smart screens, interior cameras and more. These appliances streamline the shopping process saving time driving, shopping and re-filling regularly used items.

COOKING WITH SPEED

Americans spend about 37 minutes daily preparing and cooking meals, not including shopping. We all know that certain devices, such as microwaves, can quickly warm up food or liquids. But no one wants to eat every meal out of a microwave. When it comes to cooking family meals, how do you take back minutes, yet still cook delicious, healthy meals?

For cooktops, an easy way to do this is with induction technology. I've cooked on an induction top for years. It's lightning fast for basic tasks, such as boiling water or simmering a stir-fry, and creates a hot griddle almost instantly with cast iron. Why spend 10 minutes waiting for water to boil or an egg to fry when you can do it in two?

Ovens can also be a big-time bottleneck. If the cook has to wait for one oven dish to complete before cooking a second one in a single oven, that's too slow.

One way to address this is with double ovens. But new technology allows you to cook multiple smaller dishes within a single oven. For example, one Samsung model has two separate oven compartments in one, each of which can operate at a different temperature, saving up to 45 minutes in total meal prep time.

THE FIX IS IN (THE BACKGROUND)

Another quiet, often unsung innovation in connected equipment is self-diagnosis. Consider that the new normal for troubleshooting household appliances is to purchase an extended care plan. But for appliances, the value of these plans depends largely on the ability to remotely diagnose a piece of equipment. Appliances typically are heavy, and repairing them off site could mean a major headache. Scheduling a home visit with a repair expert makes more sense,

50 GREEN BUILDER July/August 2019

but even the best service eats away valuable minutes of the day. Scheduling the visit takes time, as does the actual repair. By knowing what parts and labor will be needed before arriving, technicians can streamline their work. For example, one Samsung model comes with an app that helps you understand and translate an error reading, so you can tell a repair person what's wrong.

TIMELY TAKEAWAY

When you add up (or deduct) some of the time saved with the innovative and connected appliances described earlier, you can see how the right technology can earn its keep in modern homes, especially in the kitchen. Even if the dividend is just a couple of hours each working week, that's 24 minutes per day that homeowners can spend with family, pursuing a hobby or just staring into space (new parents, you can appreciate that last one). Many companies offer complete suites of connected products. It's now possible to leave some of the heavy lifting in the background, while saving water, power and time. What's not to like? GB

Privacy Plateau?

As home technology becomes normalized, buyer expectations about privacy have also adjusted.

ESEARCH SHOWS THAT perceptions of privacy, across all demographic groups, are not as simple as headlines paint them. That's because most technology-minded consumers make many assumptions. They assume that basic levels of privacy will be maintained, and they accept that using technology will incur certain privacy risks. This varies somewhat by age cohort, of course.

Younger generations naturally feel the most at ease with almost any degree of data sharing. They've grown up with it. This is why millennials and "Generation Z" are often seen as the easiest upsell for every new technology.

But older generations, with their high levels of discretionary income, should not be written off. They're far from "anti" technology. In an interesting twist on the privacy discussion, research from the **Pew Research Center** found that trust in technology may be low, even declining, but that does not mean it will be rejected. People have reached a plateau where they may simply accept that there are certain privacy and security risks inherent with technology—a "cost of doing business," if you will.

What does this mean to manufacturers? Simply that they may have a little breathing room to tighten their privacy protocols now, without having to backpedal too much on product releases. As long as consumers trust that privacy is improving across the board, they're less likely to throw up their hands and reject connected technology outright.

www.greenbuildermedia.com



Life gets busy—but when your home technology is connected into one simple-to-use system, it helps take away some of those daily little stresses. A true smart home makes your life more convenient and your home safer, more comfortable, energy efficient, and easy to enjoy.

With Control4, every interaction is more meaningful.

CONTROL4.COM



©2019, Control4 Corporation. All rights reserved. Control4, the Control4 logo, and the 4-ball logo are registered trademarks or trademarks of Control4 Corporation or its subsidiaries in the United States and/or other countries. All other names and brands may be claimed as the property of their respective owners. All specifications subject to change without notice

YOUR HOME

IAQ: Breathe Easier

Products, Research and Advice for Improving Indoor Air Quality

The New Dorm Norm

As architects rethink college constructs residence halls are getting healthier.

BY JAVIER ESTEBAN

N 1984, THE WORLD HEALTH ORGANIZATION suggested that up to 30 percent of new and renovated buildings had excessive complaints related to indoor air quality, which was directly related to Sick Building Syndrome. According to the U.S. Environmental Protection Agency (EPA), this "disorder" describes situations in which building occupants experience acute health and comfort effects that appear to be linked to time spent in a building, but no specific illness or cause can be identified.

While we still see cases of Sick Building Syndrome today, we have certainly come a long way from the less healthy buildings of the 1980s. Today, designers are focused more than ever on specifying and constructing healthy buildings, including residence halls.

To put into perspective the importance of this issue: According to the EPA, the average American spends up to 87 percent of their time indoors, inside buildings. Everyone lives and breathes in manmade spaces with a certain amount of filtered fresh air, surrounded by products with high levels of chemicals. That's certainly true of residence halls.

So, what is a healthy building—or more specifically—what constitutes a healthy residence hall?

There are many definitions, but in general, a healthy residence hall is architecturally designed to promote physical activity and healthy habits, while using healthy materials and building systems to provide a healthy environment.

Getting going with some get-up-and-go among students

Buildings can promote student physical activity through spaces that encourage exercise, such as a prominently located main staircase. By creating a wide and welcoming staircase with lots of natural light where students can also hang out (commonly called the "community stair"), students will often use it for at least the first three floors.

Another strategy is locating elevators in a secondary place behind the staircase, to encourage students to use the stairs. Special consideration must be taken to not to segregate students who are in wheelchairs or visually impaired.

The Active Design Guidelines published by New York's departments of Design and Construction, Health and Mental Hygiene, Transportation, and City Planning includes multiple strategies that can be used for site planning, as well as the exterior and interior of a building to promote exercise. This is especially important in the context of a "mini city" such as a university campus, where means of transportation include bicycles, skateboards and electric scooters, in



Lobbying for change. Creating a wide and welcoming staircase with lots of natural light gives students a place to hang out, and encourages exercise from using the stairs instead of an elevator.

addition to the traditional campus bus. The opportunities to create an active campus are infinite, but it requires the common vision of all stakeholders.

Integrated building signage can be used not only as a wayfinding tool, but also as motivation and information about healthy habits. For example, signage can inform students how many calories they burn by climbing one flight of stairs, while small signs can provide mile markers on campus walks.

This interrelates with promoting healthy habits. Research shows that creating additional vistas to the landscape and active spaces motivates people to move.

Color and lighting are also very important in setting the "mood" of the building. Lively colors induce movement, together with living walls thriving with vegetation; all are part of the concept of *biophilia*—an innate tendency in humans to seek connections with nature and other forms of life. The intent with these initiatives is not necessarily for students to start exercising in the building, but rather to make the users more active in their daily routines by, using The great indoors. A life-friendly residence hall, such as Saints Residence at Maryville University in Saint Louis, promotes physical activity and healthy habits by being designed with green materials and



what behavioral economists call "nudging," or small pushes toward changing behavior.

Next, furniture selection is integral to the built environment. It is very important in residence halls to have variation in the furniture, tables and chairs, soft seating, etc. This also includes active furniture spread out in small meeting rooms, study rooms and lounges-all to create a more dynamic and active residence hall.

Sometimes the message is a lot more direct. For example, at North Residence Hall at Indiana University-Purdue University Indianapolis (IUPUI), KWK Architects designed a very open fitness room integrated with the floor that not only blends with the social functions of that community, but also takes advantage of expansive views of downtown Indianapolis. The design and location of the room also allows other floor residents to go to the top floor and get exercise in a relatively private manner.

Specifying healthy materials

www.greenbuildermedia.com

The use of healthy materials is very important in the construction of any residence hall, and it starts from day one—understanding which materials will be selected for the design. Consumers are used to seeing ingredient labels on the foods they purchase and eat every day, so why not start doing the same thing for a building that students will spend most of their time in on campus?

52 GREEN BUILDER July/August 2019

July-August 2019 Issue.indd 54-55

www.greenbuildermedia.com/iaq-home-page-green-builder

"The average American spends up to 87 percent of their time indoors, breathing filtered fresh air, surrounded by products with high levels of chemicals."

There are three major systems in place that help create an inventory and screening of the major components of building materials that students are surrounded by—Health Product Declaration (HPD), Cradle-to-Cradle Products and Red List Products. All three systems are used to identify and ensure compliance with LEED or Living Building Challenge requirements, and help designers select materials that contain minimum amounts of (or are void of) harmful materials. This requires conversations with construction product manufacturers, as it happened several years ago with the push for more recycled content



or the substantial reduction in VOCs (volatile organic compounds) in paints, glues and sealants. Of special importance are the LEED v4 requirements, which have encouraged manufacturers to publish HPDs on many construction products.

More and more materials used in building interiors today include sustainable, recycled materials, such as countertops made from recycled plastic waste and carpet nylon made from recycled fishing nets harvested in the Philippines and Central Africa.

Even the mechanical and plumbing systems can be designed to ensure clean fresh air, reduction of pollution and adequate air filtering—not only at the building level, but also at the source of the chilled water or steam in cases of power plants and campus loops, very common in the context of the university campus.

Including filtered drinking water fountains in strategic locations instead of soda vending machines can help promote an overall healthier environment for students. Traditional water fountains are also being replaced by water bottle refill stations. Additionally, vending machines can sell healthy snacks and beverages.

One of the established paths to achieving a healthy building is to incorporate a WELL building standard (Silver, Gold or Platinum) composed of seven concepts: air, water, nourishment, light, fitness, comfort and mind. The goal is to advance health and well-being in buildings.

There is clear synergy between active and sustainable buildings: They both encourage and promote a healthy environment outside and inside buildings. GB

Javier Esteban is a KWK Architects principal. Founded in 2013 by five architects with a combined 150 years of higher education knowledge and experience, KWK Architects partners with colleges and universities across the United States to create innovative and inspiring places that enhance campus life.

www.greenbuildermedia.com

To coincide with our historic 100th anniversary in 2025, we've made a series of commitments to sustainability that are equally as momentous.

As we work toward our goal of Designing for Zero Waste, we will:

- Launch a line of heating, cooling and water heating products that boast a 50% reduction in greenhouse gas footprint
- Reduce greenhouse gas emissions by 50% and achieve zero waste to landfill in our global manufacturing operations
- Train 250,000 plumbers and contractors on sustainable products or sustainable installation and recycling best practices



DEGREES OF EFFICIENCY

Rheem.com/Sustainability

54 GREEN BUILDER July/August 2019



INTEGRATING SUSTAINABLE THINKING INTO EVERYTHING WE DO



The new degree of comfort.®

FIELD NOTES

Business tips and strategies that work.

Getting Going and Going Pro With Your Payment Strategy

With minimal effort, builders can keep track of money flowing in and out the door.

BY BRENT MEYERS

'VE WRITTEN ABOUT the importance of a vendor payments strategy for companies in today's business L climate. But the reality is it's twice as imperative for construction companies to implement this process, because the industry's payment challenges are bigger-and so is the opportunity. Payments are at the center of two critical areas of the construction business: vendor relationships and job progress. So, getting strategic about how you pay can make a big impact.

What exactly is a payments strategy? In the check-centered world of the past, it meant

money isn't what it used to be. managing float, capturing early-pay discounts, and/or shifting some payments to credit card in order to get rebates. Today, it means using intelligent automation to get the most leverage from every payment

Beyond replacing checks

you make.

It starts with eliminating paper checks—but it doesn't end there. You have to think strategically about how you're going to replace them.

First, encourage as many vendors as possible to take virtual card payments. Designed specifically for accounts payable (AP), virtual cards offer the convenience and rebates of credit cards, along with an extra level of security.

Any vendors who won't accept credit cards should be signed up for ACH payments. After that, only holdouts who absolutely won't take any form of electronic payment should get a paper check.

Sounds easy, right? It's not, for two reasons—workflow and vendor enablement.

Workflow changes can mean extra work

For years, businesses have tried to eliminate paper checks, with only

56 GREEN BUILDER July/August 2019

Paper champion? With the transition to a cloud-based payment system,

workflows for electronic payments is the last thing they need.

The vendor enablement challenge

The other factor that's kept businesses from going electronic is the task of vendor enablement. All you need to pay any vendor by check is their name and address. But electronic payments require you to know who will accept a card or ACH—and getting that information is a lot of work.

Besides that, in order to pay vendors who agree to accept ACH, you need to collect, securely store and maintain their banking information. Most AP departments don't have the resources to add comprehensive, ongoing vendor enablement and data security to their workload.

Construction companies face even bigger vendor-enablement challenges. Every job is almost like a mini-company, with different owners and different business entities, localized vendors, and an ever-changing roster of local and specialty subcontractors. I've sold AP solutions for over a decade, and have never seen an industry with as much payment complexity as construction.

At the same time, construction also faces low profit margins and

www.greenbuildermedia.com

moderate success. Simply adding

a card product or bank-provided

ACH hasn't gotten them across

the finish line, because those

solutions only move money

electronically. They don't help

reduce the necessary frontend work to get to the point of

payment. Ironically, introducing

payment types like card and

ACH solutions on their own can

actually add more workflows and

A complicated process is one

reason construction companies

are still mostly check-based.

They're already managing lien

releases, progress payments and

job-cost accounting on top of the

usual AP process. Adding more

complexity to the process.



ever-changing roster of subcontractors.

scarce IT resources, and sees fit to spend most technology investment on field operations. Further, with many construction companies run by founding families, the tradition of the owner signing every check dies hard.

Not just for consumers

Here's the good news: Just as they did with consumer payments, technology companies have stepped up to go beyond moving money electronically. Automated payment solutions enable you to make every type of payment from a single interface. There's just one workflow: deciding which invoices to pay and clicking the "pay" button.

You don't even have to know how a vendor wants to get paid. Solution providers now use cloud-based networks to handle vendor enablement and information management at scale-and a lot of your vendors are probably already part of their networks. Plus, the cloud lets providers integrate their solutions into your enterprise resource planning (ERP) or accounting system with just a few hours of IT time. These new fintech systems can help most businesses reach 80 percent or more electronic payments. It's a project that pays for itself quickly and frees up AP time for other initiatives.

Early electronic-payment adopters in construction have found that being able to pay vendors on time consistently with full remittance data helps them attract top subcontractors to bid on their jobs. They can also enable field supervisors to approve payments in the cloud

www.greenbuildermedia.com

www.greenbuildermedia.com/bright-business

Filling (out) the bill. When it comes to balancing the books, construction companies are among the most complex entities, due to their many vendors and

while on their jobsites, which saves tons of time and really helps keep jobs moving.

Positioning for the future

Although construction lags other industries in adopting technology, in general, it's not far behind in terms of payment automation. Many companies are slow to adopt electronic payments, because they're simply unaware of new automation solutions. For years, bank and card products have been the only game in town, even though they haven't solved for all the complexity surrounding payments. Things have changed, and there's a lot coming down the pike, including innovations in accounts receivable (AR), trade finance and dynamic discounting.

As payments become automated in the cloud, companies are gaining enough visibility and speed in invoicing and payments to leverage these advanced programs. Even if you're still heavy into checks, you're not a long way from being able to capitalize on new technology solutions.

So, it's time to start thinking strategically about payments-not just as paying bills or shifting from paper to electronic. Think about payments as an area where you can leverage technology to increase value and get out on the leading edge of back-office innovation. GB

Brent Meyers is the vice president of national sales for Nvoicepay. He specializes in regulation compliance and expense reporting solutions for the accounts payable industry.

CODEARENA The Latest Rules, Regulations and Codes Impacting Sustainable Construction

Four IECC-R Proposals to Track in 2019

Keep an eye on these possible compliance actions heading your way in the near future.

BY MIKE COLLIGNON

HE INTERNATIONAL ENERGY CONSERVATION CODE (IECC) Group B code hearings were held in Albuquerque, N.M., from April 28 to May 8. While there were a number of codes being considered during this 11-day stretch, the IECC is arguably the "star" of this set of codes. There were hundreds of code change proposals filed; some familiar, some new. Rather than rehash all that transpired over the six days that the IECC-R was heard, we're going to highlight the outcomes of a few significant proposals.

[NOTE: In the context of this article, "outcome" means the decision of the code committee, and is the first stage in a three-stage process. After the code committee makes its recommendation, the code change proposals and the respective recommendations are put out for public comment. Those comments will then be considered at a public comment hearing (PCH) in Clark County (Las Vegas), Nev., on Oct. 23-30. Per the ICC: "Following the PCH, the Online Governmental Consensus Voting (OGCV) period will start approximately two weeks after the conclusion of the PCH. The results of the PCH will be combined with the OGCV to determine the final disposition of the code change proposals that were considered at the PCH."]

RE17-19

\star PROPOSAL: This would create a new compliance alternative in Section R407. Compliance would be determined using heating and cooling load analysis. Energy code compliance through this path would still need to meet the provisions identifiedww in Sections R102.3, R403.5, R403.8, R403.9, R403.10, R403.11, and R404.1:

Equivalent HVAC building load. The ratio of the space cooling load and space heating load to conditioned floor area shall be less than or equal to the values in Table R407.3.

Air leakage and duct leakage testing would be retained in this proposed compliance path.

58 GREEN BUILDER July/August 2019

TABLE R407.3 (IRC N1107.3)

Cooling and heating load per square foot

Climate Zone	Cooling Load per Square Foot	Heating Load per Square Foot
0	10.1 Btuh	3.1 Btuh
1	8.9 Btuh	4.6 Btuh
2	11.6 Btuh	7.3 Btuh
3A and 3B	6.5 Btuh	8.5 Btuh
4A and 4B	7.6 Btuh	8.8 Btuh
30	3.3 Btuh	5.8 Btuh
4C	6.0 Btuh	7.1 Btuh
5	7.0 Btuh	11.4 Btuh
6	5.5 Btuh	11.6 Btuh
7	4.9 Btuh	13.1 Btuh
8	4.0 Btuh	18.1 Btuh

★ COMMITTEE ACTION: Approved as Modified: "This is a clean and simple compliance path: It increases flexibility by adding another option, focuses not on materials but efficiency. The modifications clarified that the language applies to envelope load and it does not impact equipment efficiencies or lighting, corrected the citation, and added as mandatory the certificate (Vote: 6-5)."

★ COMMENTARY: Interestingly, there was an assembly motion to disapprove this proposal. However, the online vote after the hearing did not sustain that motion (by a 61 percent to 39 percent margin), so it remains approved as modified. This will be a proposal that will certainly garner a number of comments this summer, and will generate quite a bit of testimony in October.

RE27-19

★ **PROPOSAL:** This proposal would create a new compliance option for wood-frame wall insulation requirements. (The underlined content in the table equals proposed new language.)

This proposal looks to accomplish a few things:

1. Include an additional equivalent insulation option for cavity

www.greenbuildermedia.com



Table R402.1.2 (IRC N1102.1.2)

Insulation and Fenestration **Requirements by Component**

Climate Zone	Wood-Frame Wall R-V
1	13 or 0+10 ^h
2	13 or 0+10 ^h
3	20 or 13+5 $^{\rm h}$ or 0+15
4 except Marine	20 or 13+5 $^{\rm h}$ or 0+15
5 and Marine 4	20 or 13+5 $^{\rm h}$ or 0+15
6	$30 \text{ or } 20+5^{h} \text{ or } 13+10^{h}$
7 and 8	$30 \text{ or } 20+5^{h} \text{ or } 13+10^{h}$

ⁿ The first value is cavity insulation, the second value is continuous insulation. For example, "13+5" means R-13 cavity insulation plus R-5 continuous insulation.

insulation, because in the 2018 IECC, an equivalent cavity insulation-only option is missing in Climate Zones 6-8. 2. Provide for equivalent continuous insulation-only options, which

- are also are missing.
- 3. Provide the table with a simple-yet-complete set of insulation options for location of insulation on wood-frame wall assemblies for each climate zone, which would improve the usefulness

www.greenbuildermedia.com

) ^h or 0+20 ^h) ^h or 0+20 ^h

of prescriptive options and show the full range of equivalent insulation options (e.g., cavity only, hybrid cavity + continuous, and continuous only).

4. Address concerns that the prescriptive table favors certain options over others by excluding viable options in some climate zones.

5. Provides more flexibility to coordinate insulation options with vapor retarder provisions in the building code, which vary by climate as well as insulation strategy. The proposed flexibility gives users more choice between insulation options that provide equivalent assembly U-factor (as a minimum requirement of the energy code), yet have different capabilities and functions with respect to comfort, air tightness, moisture control, thermal bridging mitigation, and other factors that are important to an overall code-compliant wall assembly.

The reason statement for this proposal also contains a number of calculation spreadsheets for the different insulation levels/respective climate zones

★ COMMITTEE ACTION: Approved as Submitted: "This provides additional options for compliance. It simplifies code language and encourages users to look at all the associated issues (Vote: 8-3)."

★ COMMENTARY: If for no other reason than the 8-3 committee vote, this will probably have comments filed. However, it seems to have positive momentum heading into October's hearing.

RE223-19 (APPENDIX RB)

★ PROPOSAL: This proposal would create a new appendix for zeroenergy residential buildings. This section, if adopted, would require the rated design to have a score less than or equal to the values in Table RB103.2, when compared to the ERI reference design determined in accordance with RESNET/ICC301 for ERI values that include and do not include onsite power production.

The footnote in this table creates a prescriptive backstop of the 2015 IECC, which already exists in section R406 of the 2018 IECC. While the ERI numbers are notably lower than those in the body of the code, this is a zero-energy appendix.

Table RB103.2 (IRC AQ103.2)

Maximum Energy Rating Index^a

Climate Zone	Energy Rating Index Not Including Onsite Power	Energy Rating Index Including Onsite Power (As Proposed)
1	43	0
2	45	0
3	47	0
4	47	0
5	47	0
6	46	0
7	46	0
8	45	0

^{a.} The building shall meet the mandatory requirements of Section R406.2, and the building thermal envelope shall be greater than or equal to the levels of efficiency and SHGC in Table R402.1.2 or Table R402.1.4 of the 2015 International Energy Conservation Code.

A quick note on appendices: They are sections of building code language typically confined to a specific topic. Since these sections are not in the body of the model code, they are considered optional content that jurisdictions can choose to adopt if it is applicable. An example would be the appendix on tiny homes. Some jurisdictions have seen a rise in tiny home construction, so they have adopted that appendix to provide the local building community with code guidance. Other jurisdictions have not felt the need to adopt the tiny home appendix yet.

★ COMMITTEE ACTION: Disapproved. "It needs additional compliance language for buildings without solar. Does not offer guidance or flexibility; it needs the term "net" included in title, and the ERI numbers are too low (Vote: 6-5)."

★ COMMENTARY: Because of the near-split decision, as well as the guidance provided by the committee, this will likely have a handful of comments filed against it. It wouldn't be surprising to see this proposal, or something like it, being added to the 2021 or the 2024 IECC. With so many cities and states committing to 100 percent renewable energy goals by 2030, 2040 or 2050, the ICC will need to provide a tool for their members (code officials) in those respective jurisdictions, preferably sooner than later.

In the reason statement, it is stated that this appendix's guidance would result in a residential building that has zero energy consumption over the course of a year. That's a little deceptive, because while that would most likely be true in years 1 and 2, as the

60 GREEN BUILDER July/August 2019

onsite power production system (probably PV) degrades over time (approximately 1 percent loss in productivity per year), the building will no longer be zero energy. It will still have a very small utility bill, but after 10 years, it will go from a zero-energy building to a roughly 10 percent energy building.

RE224-19 (PARTS | AND II; APPENDICES RB AND U)

★ PROPOSAL (PART I): This proposal is attempting to add stretch code provisions to the appendix of the IECC. To accomplish this, residential buildings or portions of residential buildings would need to look to the requirements of ASHRAE/IES Standard 90.2.

COMMITTEE ACTION (PART I): Disapproved: "If it is in an appendix, it takes a specific action by a jurisdiction. If it is an alternative path, it belongs there. Unclear if mandatory requirements are included. There is an unconfirmed potential conflict with the 2018 IECC and the potential unconfirmed comments on the 90.2 (Vote: 7-4)."

★ **PROPOSAL (PART II):** This proposal is attempting to add stretch code provisions to the appendix of the IRC. Since many of the provisions within the IECC-R and IRC Chapter 11 are consistent/overlapping, it is usually prudent for a code change proposal of this magnitude to cover both documents.

It was also noted in the reason statement that a stretch code that references ANSI/ASHRAE/IES Standard 90.2-2018 allows for a stretch code that is based on an ERI methodology compatible with the ERI pathway within the base IECC.

★ COMMITTEE ACTION (PART II): Disapproved: "Keeping in alignment with the decision for Part 1. If it is in an appendix, it takes a specific action by a jurisdiction. If it's an alternative path, it belongs there. Unclear if mandatory requirements included. There is an unconfirmed potential conflict with the 2018 IECC and the potential unconfirmed comments on the 90.2 (Vote: 7-4)."

★ COMMENTARY: There are many ways to structure a stretch code. This was merely one approach. While rejected by the committee, the talented and intelligent people who work on codes will probably come up with a suitable alternative either this summer or during the next code development cycle.

The committee action on Part II is simply staying consistent with its action on Part I.

Public comments can be filed on any code change proposal, regardless of the committee's recommendation. To do so, one would need to sign up or log in to cdpACCESS and file comment(s) by July 24, 2019. Registration is free and open to anyone. GB

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

COURTESY OF The Green Builder[®] Coalition

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

www.greenbuildermedia.com





Be a part of the only conference specifically designed to help high performance home builders succeed.

The entire high performance building community is coming together to share new insights, innovations, building methods and business best practices — and it only happens once a year.

This is your best opportunity to get new ideas, form new alliances and connect with like-minded professionals all in one place.

Register today — and thrive in 2020! SUMMIT.EEBA.ORG

ENERGY & ENVIRONMENTAL BUILDING ALLIANCE | EEBA

AD INDEX

2020 Sustainability Symposium

Improving the Human Condition www.greenbuildermedia.com/ sustainability-symposium-2020improving-the-human-condition COVER 2 AND PAGE 1

Control4

Your Home Simplified www.control4.com PAGE 51

DuPont Tyvek

Build with pride. Because your reputation is your business. tyvek.dupont.com COVER 3

EEBA High Performance Home Summit

The only conference specifically designed to help high performance home builders succeed. summit.eeba.org

PAGE 61

Hanwha Q Cells A new era of American quality. www.hanwha-qcells.com PAGE 11

LG Solar Install Trust. www.lg-solar.com PAGE 8

LG HVAC Solutions

A 2019 Eco-Leader www.lghvac.com PAGE 9

Moisture Shield

Composite Decking Innovation built into every board. www.solidcoredifference.com/contractor COVER 4

Panasonic Solar

Maximize every roof. na.panasonic.com/us/solar PAGE 3

Rheem

Comfort for today and for our future. www.rheem.com/sustainability PAGE 55

Trex

#1 Greenest Decking Brand Since 2009 www.trex.com PAGE 13

VISION House Seattle Cascades

The House the Experts Built www.greenbuildermedia.com/visionhouse-cascades PAGE 4

WaterFurnace

Break new ground with a geothermal community www.waterfurnace.com/neighborhoods PAGE 7

Western Window Systems Design Better. www.westernwindowsystems.com

PAGE 5

Whirlpool 3 out of 4. That's the number of U.S. homes that count on our products. www.whirlpoolpro.com/3of4 PAGE 63



COMING NEXT ISSUE

62 GREEN BUILDER July/August 2019

GREEN BUILDER

Building Science

The U.S. Department of Energy shares its research and discussions on how to improve building performance.



www.greenbuildermedia.com

That's the number of U.S. homes that count on our products.*

Trust doesn't come easily. It's the result of time, experience and hard work. We're honored that the majority of U.S. homes depend on our products. And we're committed to maintaining the same level of trust with you by providing **quality appliances, purposeful innovations** and **reliable service** that will help you sell more homes.





* Based on a Whirlpool Corporation consumer survey

KitchenAid

JENN-AIR

FROM THE TAILGATE

New Offerings for the Sustainable Minded

That 'Ounce of Prevention'

HEN YOU RESIDE at almost 9,000 feet above sea level, you don't necessarily give local flooding a lot of thought. Flooding is something you see and hear about on the news coming from coastal regions and the farmlands in the Midwest. That changed for us here in the Colorado Rockies this summer, after we received roughly twice our normal snow accumulation over the winter. That tremendous snow load triggered massive avalanches here and in many other parts of the Mountain West, as they crashed down the slopes and chutes with incredible force.

They mowed down entire sections of forests, turned thousands of mature trees into shattered missiles, and then deposited them, along with trainloads of boulders, into gigantic debris piles held together by ice and packed snow. As a result, the pending snowmelt represents flooding threats in the creeks and rivers up in the high country on a scale rarely experienced over the decades. Our little village has been under flood warnings since the middle of spring and, as of this writing, the threat persists even though thousands of sandbags now line many of our buildings and roadways.

Several years ago, I had the opportunity to deliver a presentation on the same program as retired General Russel Honoré, the renowned military commander who was sent into New Orleans in the aftermath of Katrina to restore order and provide protection, assistance and hope to the

citizens there. Honoré was a leader known for getting results and for providing colorful sound bites.

On the subject of floods he is quoted as declaring, "This is a disaster. This isn't something somebody can control. We ain't stuck on stupid." Unfortunately, we may be. Many places experience the same series of catastrophes and disasters time after time, and yet we continue to build and rebuild in many of them.

The General said that he had previously declared that "recovery costs five times more than prevention," but subsequent reports from the federal agencies responsible for dealing with such events showed him to be in error. The data from those studies indicated that the actual costs were tenfold or even more. Yet, the homebuilding and real estate development industries relentlessly lobby lawmakers to maintain their opportunities to harvest profits from risky projects in areas that are often marginally safe at best.

The old axiom, "an ounce of prevention is worth a pound of



cure," famously attributed to Benjamin Franklin, is believed to have referred to fire prevention, but it can apply to many kinds of threats that result from a host of man-made and "natural" disasters. Sadly, the wisdom in his words often falls on deaf ears, when short-term economic opportunities are at stake.

Many of us have recognized that we are witnessing just the tip of the proverbial (melting) iceberg, when it comes to pending environmental challenges and the many disasters that are occurring with increased frequency and intensity. But collectively, our industry appears willing to pursue the business-as-usual model for as long as there are profits to be grabbed, regardless of how steep the odds are that history will continue to repeat itself, often in ways that are bad for everyone.

One more quote from General Honoré seems increasingly worth considering: "People need to be cautious, because anything built by man can be destroyed by Mother Nature." **GB**

www.greenbuildermedia.com

By Ron Jones

A NEW ERA OF AMERICAN QUALITY INTRODUCING THE NEXT-GENERATION Q.PEAK DUO BLK-G6+

64 GREEN BUILDER July/August 2019





Excel Everyday



Innovation built into every board. Stay protected from the elements and ensure lasting beauty, day in and day out. Contact us at sales@moistureshield.com today.

SolidCoreDifference.com/Contractor