



THE NET-ZERO TRACT HOME

MERITAGE'S NET-ZERO PRODUCTION HOME IN THE VERRADO COMMUNITY OF BUCKEYE, ARIZ., USES ENERGY-SAVING TECHNIQUES THAT EXCEED STANDARDS DEVELOPED BY THE EPA FOR ITS ENERGY STAR HOMES. PHOTOS COURTESY OF MERITAGE HOMES.

A final frontier in sustainable housing

JAMES ASKEW

In 2005, Meritage Homes, a large-scale, production homebuilder headquartered in Scottsdale, Arizona, saw one of its most productive years to date. That year alone, Meritage Homes built close to 15,000 single-family houses, making it one of the top ten production homebuilders in the country. "We just put our heads down and built homes," says C.R. Herro, Meritage's Vice President of Environmental Affairs. "The emphasis was on doing what we did well," and that is what Meritage did. The company was founded in 1985, and in just

20 years it became a master at building a broad range of production homes with as much speed and efficiency as possible. Even today, Meritage offers some of its clients a "99 Days. Your Home. Your Way." guarantee, with prices that can dip below \$80 per square foot.

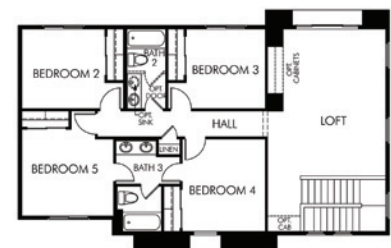
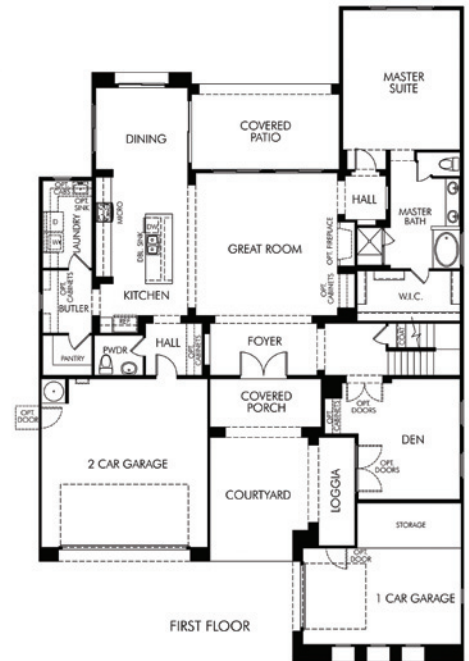
Meritage's success, like the success of its competitors, had reached a zenith in 2005. The company operates in seven states: Arizona, California, Colorado, Florida, Nevada, North Carolina and Texas. Those same states saw a surge in

population over the preceding decade, spurring the largest housing boom in U.S. history. Housing starts in the U.S., that year, topped a record-breaking 2 million homes, with the vast majority of that development taking place in these classically warm-weather states. However, by the close of 2006, most of that had begun to change. Meritage was still on top and ranked among the industry giants, only the competition had begun to diminish. 2006 was the beginning of the end for the housing boom. Housing

VERRADO

THE HOOVER

3,391 SQUARE FEET



SECOND FLOOR

starts slumped, and by 2009, they had hit their lowest level in more than 70 years, with just 580,000 new homes built across the whole of the country. The housing boom was over, and Meritage Homes, like nearly every builder in the nation, was about to face its leanest years in decades. The question Meritage had to ask, as did all others, was simply: How would the company survive?

When faced with a market like this, says Herro, a production builder has one of two choices to make. "The market gives you a square-foot price that the market will bear," he explains, "and you can either strip down and cheapen up to compete with bank re-sales, or you can come to the market with something that has a different value and creates its own opportunity, and the latter is what we consciously choose to do."

It was Herro's job, hired by Meritage in August 2009, to create that opportunity. "I was hired specifically to do innovation for the company," he says, "so they created a role I don't think exists anywhere else in the homebuilding industry. They hired a wacky environmental engineer and let me loose." Herro actually holds two master's degrees, one in environmental engineering and the other in environmental biology, and he is, in his own words, "the in-house nerd," at Meritage. "To his credit," Herro says of company founder and CEO, Steve Hilton, "he said, 'Hey, we are going to

hire someone whose job is to just focus on where the winds are blowing us and what is the best thing that we can do—the highest value for the least dollar—that lets us build something special.'"

That something special, to Herro, was evident from the start. Herro is "a nerd." He is an engineer. And he knew where the winds were blowing. Herro has worked in the construction industry for more than 20 years, and during all that time he has kept a keen eye on the advancing green-built market. "The building industry," he observes, "has had very little innovation for the last 40 years, while a tremendous amount of innovation was going on around it." To Herro, the industry was stilted, caught in the single-minded pursuit of efficiency at the expense of other advancements. Green building in the U.S., he notes, had remained mostly on the periphery of the overall housing market. A few, generalized innovations had filtered through. Appliances became more efficient. Insulation was beefed-up and then altogether changed. Windows were upgraded. But when it came to a wholesale re-imagining of the single-family home, that was left primarily to high-cost, custom homes and show homes never intended for resale. "All the pieces of the puzzle have existed for 20 years," Herro says. "We just went through the trouble of putting it all together. All I did was stand on some really broad shoulders, take the best of



THE KITCHEN AND FAMILY ROOM INSIDE THE MASTER-PLANNED COMMUNITY OF VERRADO.



AN ALTERNATIVE VERRADO COMMUNITY KITCHEN.

the best from around the world, and that is our program."

Meritage's new program, under the direction of Herro and officially launched in September 2010, was to design, build and sell the U.S.'s first net-zero energy tract home, at a price competitive with the production home market. The company now builds its net-zero homes in two communities and offers a similar option on

all other homes it builds. "The first thing we did," says Herro, "was to look at the building shell: the windows, the insulation, the framing, the conditioned attic, the lighting system and the appliances, all of which work to cut the energy demand for the footprint of that house in half." From there, Meritage moved on to energy production, part two of the net-zero equation. The company joined forces

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with EchoFirst, Inc, manufacturers of the EchoFirst Solar System, an innovative dual solar PV and thermal array, with an integrated air management system. Standard on nearly every Meritage Home is now a 2.15 kWh EchoFirst Solar system, and for roughly \$10,000 more, clients can upgrade to a 5.64 kWh system that would make the house a net-zero energy home.

The EchoFirst system, itself, represents an impressive advancement in efficiency, increasing the energy output over a similarly sized PV system by upwards of 100%. Meritage's partnership with EchoFirst, Inc. shows why the production homebuilder belongs in the sustainable market. As Herro notes, though many builders offer similar amenities, most are offered as add-ons and built on a house by house basis. Meritage made these amenities standard, and by doing so, it was able to leverage its economy of scale, both in terms of material costs and installation. "A big piece of this is our trade partners," Herro says, "because all the things we do on these homes, we'll do 3,500 times. We spent a year designing, and we spent six months with our trade partners (framers, plumbers, etc.) getting their heads around it."

Oriana Schooley is a sales associate for Meritage in the master-planned community of Verrado, just outside Phoenix, Arizona. Phoenix and the surrounding Maricopa County was, and still is, one the hardest hit regions for foreclosures in the U.S. Roughly 15% of Arizona households received a foreclosure notice in 2009. The market is tougher than it has ever been, says Schooley, and yet she remains decidedly optimistic. "This has been great for us," she says of Meritage's new net-zero program. DMB Associates Inc., out of Scottsdale,

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Ariz., is the developer at Verrado, and five builders, including Meritage, are vying for the buyer's attention.

To help both educate and attract those buyers, Meritage has built a partially deconstructed model home, which the company uses to emphasize its new "extreme energy efficiency" approach. Some clients are sold on the spot, Schooley says, while others need as much educating as they do selling. The sales pitch takes longer and it is far more complex, but the results are impressive. In the Verrado community, the Meritage sales team has managed to outsell its leading competitor by more than three to one, and this, Schooley notes, with homes that can carry a premium of \$20,000 or more.

"I think it is the cake and the

icing, too," she says. "Here, there is no compromise. I am the largest lots, the most square-footage, the most efficient, the most technologically advanced and I am the most expensive. So, when it comes down to it, there is no real explanation for why it is going as well as it is, but my understanding is that we've taken a two-year project and we are down to the end of it (after) only 10 months." And this, she adds, in the worst housing market in U.S. history.

"Is there a lot of potential coming?" says Herro. "Yes. Have we extracted all that value? No. But, we are extracting some, and in this market, that's just fine with us. These homes, with this kind of incorporated extreme energy efficiency, have demonstrated to be more profitable for us than conventional construction." 

MERITAGE HOME'S ENERGY-SAVING FEATURES

CUTTING-EDGE RENEWABLE ENERGY

- :: Roof ECHO Solar System produces up to 10,000 kWh energy from the sun.
- :: Solar water heating that reduces waste with an insulated water tank, which will better maintain water temperature.
- :: Solar Control Center connects to the water heater, solar panels, thermostat and HVAC system to save energy, keep your house more comfortable and manage your indoor air quality electronically.

ENERGY EFFICIENCY

- :: Certified by Energy Star and named the 2011 Energy Star Partner of the Year.
- :: Efficient appliances provide a 10-50% reduction in wasted energy.
- :: Estimated 80% overall home energy savings.
- :: Advanced lighting systems with LEDs and CFLs that uses 90% less energy.

THERMAL ENVELOPE

- :: High performance wall systems consist of advanced framing with staggered 6-inch thermally-broken walls that slow the transfer of heat between indoor and outdoor environments.
- :: Demilec high-grade spray foam insulation in walls as well as the attic create an airtight seal in the home and a consistent temperature throughout.
- :: Double Low-E vinyl windows reduce energy loss by as much as 30-50% over regular windows, keeping homes cooler in the summer and warmer in winter.

INDOOR AIR QUALITY

- :: Certified by Environmental Protection Agency's Indoor airPLUS program and Clean Indoor Air program.
- :: SEER 14 HVAC system with programmable thermostat increases comfort and decreases operating costs up to 40%, as compared to a home 10 years old or older.
- :: Low VOC (volatile organic compounds) carpets, paints and finishes for a healthier home.
- :: MERV 8 air filters that effectively reduce pollen, dust, pet dander and other fibers from indoor air to increase home comfort and reduce allergy symptoms.
- :: A 0.1 air exchange per hour (AEH)—the number of times the air is replaced—while a typical home can be more than 2 air exchanges per hour.

WATER MANAGEMENT

- :: Certified by the Environmental Protection Agency's WaterSense program.
- :: Water efficient features, such as faucets and showerheads reduce the water bill by as much as 50%.
- :: Dual flush actuator toilets utilize at least 20% less water than traditional toilet models.
- :: Xeriscape landscaping was carefully designed to minimize water use in the desert.
- :: Weather-sensing smart irrigation controllers monitor minimize water use based on weather conditions, watering only when needed.



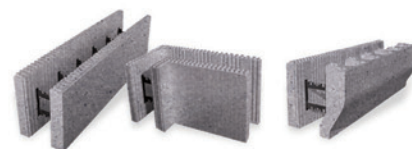
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PAVERS	Phoenix Paver: color Native Blend
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