



Efficiency for all. Each cottage in Sage at Maple Lawn include high-performance options as a standard.

CREDIT: BOZZUTO

# On the Path to Net Zero

High-performance housing developments bring energy efficiency and new technology to communities around the country.

HIGH-PERFORMANCE HOUSING is no longer limited to just a few homes here and there. Enter the high-performance housing development market, in which entire communities are built as efficiently as possible. These master-planned communities are engineered for efficiency and high-performance from the ground up. This shift from the solo to the communal is driven by a variety of factors: building code, environmental issues such as climate change, materials manufacturers and government policy.

“You have a confluence of factors, where the environment in which we live is changing and forcing people to change behaviors and look for different solutions,” says Shailesh Topiwala, director of corporate business development for Robert Bosch LLC.

One of the biggest factors driving high-performance building is climate change, which has caused consumers to become more concerned about their individual impact on the environment. Manufacturers are now working to develop better, more efficient materials; builders work to create new, more efficient construction processes; and government agencies work to implement policies and codes that encourage innovation.

These changes have led to the creation of high-performance housing developments, as consumers seek efficient housing communities. Bosch is at the forefront of this trend, providing a number of high-performance housing products to lower energy bills and push forward innovative processes.

“We have products and solutions and systems for here and now; it’s



not just about five to 10 years from now,” Topiwala says. “We know consumers have an expectation, and we target to meet and exceed those expectations.”

Bosch is involved in a number of high-performance developments around the country, including Sage at Maple Lawn by Bozzuto and Whisper Valley by Taurus Investment Holdings. “If you can design using the right thinking up front, the overall commercial design and impact of the neighborhood can be well-managed to help promote healthy lifestyles with limited impact on the carbon footprint,” Topiwala says.

#### **MODERATELY PRICED EFFICIENT LIVING**

Whisper Valley is a 2,063-acre, mixed-use community being developed in Austin, Texas. It will include more than 7,500 single- and multi-family homes and more than 2 million square feet of retail and commercial space.

The community’s goal is to offer residents an environmentally sensitive and thoughtful technology lifestyle. Every building in the community will be capable of achieving Zero Energy Ready certification; the community is one of the first master-planned

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communities to meet zero-energy-ready home standards in the United States.

One way of achieving that goal is by making systems easier for builders to install, such as geothermal technology. To address that need, Taurus Investment Holdings created a thermo-energy supply system.

“Instead of asking our builder to put in those systems individually, we created a district system. We took geothermal technology and combined homes together to create a geothermal energy field, which allows us to meet the energy needs of each house much more efficiently,” says Douglas Gilliland, president of Taurus of Texas. “It’s much less complicated for a builder to hook into and saves a lot of money.”

Each home will include a Bosch geothermal heat pump, as well as a hot water system and kitchen appliances. The homes also either have solar panels already installed, or are solar PV-ready. But Taurus Investment Holdings didn’t stop at innovative energy-efficient systems.

“We’re looking at land planning from a more holistic standpoint, such as the geothermal systems, heat pumps and solar capabilities,”

**Mixed use.** Whisper Valley will include 2 million square feet of retail and commercial space, in addition to affordable, high-performance homes.



CREDIT: TAURUS INVESTMENT HOLDINGS



Gilliland says. “But we’re also looking at technology trends, like super-fast Internet service through Google.”

Google *Fiber* will be installed in Whisper Valley, and every homeowner will hook up to the system and receive 1 GB/s upload and download speeds. Google *Nest*, a smart home technology, also will be installed. Google *Nest* can help homeowners save on energy bills by optimizing heating, cooling and lighting systems, as well as alert homeowners about smoke and carbon monoxide.

Whisper Valley also focuses on connecting residents to nature, with 700 acres of outdoor space, including trails and public parks. The community will include organic community gardens and water treatment plans for irrigation.

The goal of Whisper Valley is to make these technologies affordable for first-time homebuyers—with homes starting at just over \$200,000. The first phase of construction will be complete at the beginning of 2017, and the first residents will move in at that time.

### HIGH-END, HIGH-PERFORMANCE LIVING

At the other end of the price spectrum, Bozzuto is developing a community in Fulton, Md., that includes 19 high-performance cottages. The cottages in Sage at Maple Lawn include cutting-edge efficient technology. “This section has been a great place to try out the concept, to see if we could deliver it and to make sure the market was accepting of these new technologies,” says Chris Block, vice president

of operations for Bozzuto.

All the homes offer high-performance systems, such as geothermal heating and cooling, as well as being ready for solar, as a standard. Bozzuto made a strategic decision to market the homes to higher-end buyers, with the homes ranging from \$700,000 to more than \$1 million.

“Typically, those people are more open to the technical aspects of mechanical systems,” Block says. “In our area, people have the impression that things like geothermal heating and cooling are expensive. But a higher-end buyer typically does more research and is more open to the idea.”

The cottages run on a geothermal system that uses a closed vertical loop. Bozzuto drilled two wells that are ground loops, with each well being about 250 feet deep. The energy runs through the ground and goes into Bosch geothermal equipment, which disperses the heat or cooling to each home.

Geothermal systems use less energy, because they rely on the core temperature of the Earth. In Maryland, that temperature is around 58 degrees, Block says. That means the homes will be at baseline of 58 degrees using no additional energy, so it will take significantly less energy to heat the home, and very little energy to cool it. The geothermal system also pays off in other important ways. It doesn’t require any outdoor HVAC compressor units, so there’s no HVAC-generated noise outside of these homes.



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**Outside life.** When the first residents move into Whisper Valley in 2017, they’ll have access to 700 acres of outdoor space.





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**Hidden asset.** A geothermal system from Bosch results in a baseline indoor temperature that matches the Earth's core temperature, which is around 58 degrees in Maryland. With a baseline temperature of 58 degrees, much less energy is needed to heat or cool a home.

Each cottage is also solar ready, and buyers are highly incentivized to install solar panels. The homes include high-efficiency windows and insulated fiberglass exterior doors, as well as R-38 attic insulation and R-21 wall insulation.

In addition, the cottages include home automation systems that allow owners to select optimum heating, cooling and lighting levels. All of these features allow homeowners to save 30 percent on energy bills, compared to a typical new house, according to Bozzuto.

Whisper Valley and Sage at Maple Lawn are just a couple of the developments around the country in which Bosch is involved. Bosch continues to develop new ways to make homes and systems more energy efficient and sustainable.

"If you track where the commercial building code has been

historically, where it is today and what is projected for commercial and residential construction, it's a steady progression toward conservation of all elements," Topiwala says. "That includes making building envelopes more energy efficient, as well as implementing energy and water conserving products and systems that deliver interior climate at desired comfort levels."

Master-planned, high-performance housing developments are on the rise, driven partly by consumer's concern about their impact—and the impact of their homes—on the environment. As geothermal, solar and other systems and processes continue to become mainstream, high-performance is no longer just the home of the future. High performance homes with minimal negative impact on the environment are becoming the homes of today. **GB**