Affordable Zero Energy

**NEXUS EnergyHomes proves high performance homes don’t have to break the bank**

In historic downtown Frederick, Maryland, the EVHA 2012 Home Builder of the Year, NEXUS EnergyHomes, Inc., is changing the face of affordable housing with their North Pointe community. The new 55-lot housing development features net zero energy homes offered at affordable prices, saving homeowners thousands of dollars each year on utility bills. And a crucial component of the NEXUS EnergyHomes design is a well-insulated building enclosure using structural insulated panels (SIPs).
Rising Energy Costs Create Demand

The North Pointe development began when NEXUS EnergyHomes, Inc. took control of a Department of Housing and Urban Development (HUD) Hope Six revitalization project to construct new affordable housing where an aging housing project once stood. Recognizing that utilities make up a major part of the cost of home ownership, NEXUS Construction Division President Mike Murphy began to examine how he could make the homes more affordable by reducing their utility costs.

“Our vision for NEXUS started with the idea of building better, more efficient homes and then we developed that idea all the way to net zero,” said Murphy. “With the rising cost of fuel and uncertainty about future prices, our homes have real value based on the energy they produce and the money they save homeowners.”

NEXUS spent over two years in research and development to arrive at a home design that not only reaches net zero energy use, but does so without significantly adding to the cost of the home. Murphy

After researching different wall systems, NEXUS chose SIPs for their energy efficiency and speed of construction.
says, “Anyone can spend a million dollars and create a net zero home, but to do it and market the homes at $300,000 was quite a feat.”

One of the critical areas in reducing home energy use is the building envelope. On average, nearly half of home energy is used for heating and cooling. Before Murphy could look at efficient heating and cooling equipment or solar generation, he needed to consider conserving energy through insulation and air sealing.

The North Pointe homes use a combination of structural insulated panel (SIP) walls and spray polyurethane foam insulation in the roof to limit heating and cooling loss through the building envelope. By providing continuous insulation without studs at regular intervals, SIPs greatly reduce both thermal bridging and limit air leakage. Blower door tests show results of less than 1 air change per hour at 50 pascals (ACH50) in nearly all of NEXUS’ North Pointe homes.

“We spent a lot of time researching and analyzing all the different ways we could insulate the envelope,” said Murphy. “We looked at batt insulation, spray cellulose, spray foam, and combinations of flash and batt, but when it really came down to it, SIPs made the most sense.”

As a panelized building system, SIPs saved NEXUS a tremendous amount of construction time. Using prefabricated SIPs from The Murus Company, NEXUS was able to reduce framing time by an estimated 40 percent, allowing crews to start on interior work much sooner.

“SIPs are an all-in-one product. You don’t have to bring in an insulation contractor, and you’re under roof in five to ten days,” said Murphy. “In our world, that is everything—you can work without worrying about the elements.”

In addition to the airtight building enclosure, Murphy and his design team added a geothermal heating and cooling system, an energy recovery ventilator, energy-efficient appliances, and a combination of compact fluorescent and LED lighting.
With a grid-tied solar generation system, North Pointe homeowners are credited for excess power that is transferred back to the utility company, allowing the home to reach net zero energy use over the course of a year.

Homeowners also get access to their NexusVision™ Smart System, a web-based interface for tracking their home’s energy production and consumption online. From any computer or smart phone, homeowners can not only monitor their energy use, but adjust climate controls, switch lights on or off, and control their security system.

**Finishing Touches**

In addition to energy efficiency, the homes are also loaded with sustainable materials, such as bamboo flooring, recycled glass countertops, and carpet with recycled content. The airtight SIP building envelope limits incoming air to a controlled ventilation system with a HEPA filtration unit that removes pollutants and regulates humidity for a healthy indoor environment. All the homes meet the Emerald level of the National Green Building Standard, one of the nation’s leading residential green building certification programs.

Although Murphy acknowledges that the base price of his net zero homes are slightly more expensive than conventional construction, the 1,500 to 2,000 sq. ft. duplex units are all priced under $300,000, considered affordable for the Washington, D.C. area market. Each home qualifies for sizable federal tax credits on both the geothermal and solar systems, as well as grants from the State of Maryland. But even without these credits, the utility savings alone immediately outweigh the slight increase in mortgage payments.

NEXUS EnergyHomes’ vision has been realized with record home sales, coverage by local and national media, and prestigious building industry awards acknowledging the company as the national leader in energy-efficient home building, including the 2012 EVHA Builder of the Year award. But for Murphy, the North Pointe development is only the beginning. “We knew that there was a demand for an affordable net zero energy home,” said Murphy. “Our goal was to be able to get these homes to the masses, to change the way homes are built in this country, and create a new paradigm of home ownership.”

All North Pointe homes feature energy-efficient appliances, a combination of compact fluorescent and LED lighting, and sustainable bamboo flooring.