

Green Machine

First NAHB Green Certified Home in High Country Nears Completion

Story by Sam Calhoun

William McDonough, winner of three U.S. presidential awards for green design and construction, said that his mission will not end until all homes are like trees—that is, when homes actually help the environment. His words ring true to the hundreds of National Association of Homebuilders (NAHB) members who are trying to build green homes, as well as to the many NAHB subchapters, such as High Country Homebuilders, who are trying to bring green building to their own respective regions.



Sam Zimmerman, owner of Sunny Day Homes, Inc. and in partnership with High Country Homebuilders and Building Performance Engineering, is nearing completion on the first home in the High Country to be certified as a NAHB Green Building under the NAHB National Green Building Program. Located in the Fleetwood Falls neighborhood overlooking the New River outside of Todd, the home is a 2,000-square-foot, four-bedroom mountain dwelling owned by a family from Raleigh. Zimmerman expects to complete the home by late fall, and Quint David, technical program manager for Building Performance Engineering and third party inspector of the process, expects the home will score a 369 out of 395 on the NAHB Online Green Scoring Tool, ranking it as a high silver NAHB Green Building.

Understanding the Designation



Zimmerman explained that there are basically three main certification processes for green homes—HealthyBuilt Homes, LEED certified homes and NAHB National Green Building Program certified homes. The ASU Energy Center administers the certification process for HealthyBuilt Homes in the High Country. The LEED certification process is a rigorous program, according to Zimmerman, where a full-time employee is needed just to keep up with paperwork and the certification process. Zimmerman explained that LEED started for commercial buildings and then expanded to include residential, making it a time consuming and detailed process that some

builders may not want to undertake.

For the past few years, the NAHB has been drafting green building guidelines. Nationwide, roughly 100,000 homes have been built using those guidelines, but it wasn't until February 2008 that the NAHB published its official green building guidelines. The NAHB National Green Building Program is based on the NAHB Model Green Home Building Guidelines, and since March builders have had the choice to certify homes based on the guidelines or the National Green Building Standard, the first and only consensus-based green standard for single-family and multifamily homes, developments and residential remodeling approved by the American National Standards Institute. National certification provides buyers with assurance that their home has been inspected by local experts who understand how the seven components of green building work together to create a truly green home in the most cost-effective way. The NAHB's seven components of green building are energy efficiency, water efficiency, resource efficiency, lot and site development, indoor environmental quality, global impact and homeowner education.

Builders who choose to use the NAHB National Green Building Program Guidelines can access the NAHB Online Green Scoring Tool by clicking to www.nahbgreen.org. There, builders can choose green features that are appropriate for a home's climate, region and market, as well as a nationwide directory of certified green-built homes; a list of certified green professionals; a directory of state and local green building programs; and tools and resources for consumers, builders, program administrators and policymakers. Builders score their work using the online scoring tool and then hire an independent third party to verify the score. The score is based on a total of 395 points, with any score above 237 garnering a bronze designation, any score above 311 receiving a silver designation and any score above a 395 getting a gold designation. The first certified NAHB Green Building in the High Country is expected to score a 369, or a high silver ranking.

High Country Homebuilders Break Green Ground

In 2007, High Country Homebuilders Association member Kevin Donovan established a Green Building Committee. Recognizing the growing green building movement and the exceptional intellectual resources available to green builders in the High Country—such as Building Performance Engineering—Donovan started to fill in a void with useful information on green building and the region responded. Dozens of contractors and ASU students soon flocked to the committee's meetings.



"The High Country Homebuilders all know that green is the future—it mirrors public interest," said Zimmerman. "The High Country Homebuilders decided we wanted to be a leader in this area for green building."

Zimmerman took over as chair of the High Country Homebuilders Green Building Committee in 2008, and Travis Thompson, who holds a master's degree from ASU in building science, took over as co-chair. Both former members of the Green Building Council in Asheville, Zimmerman and Thompson decided to build green homes through their respective businesses and have them certified as NAHB Green Buildings. Zimmerman is building his first—and the region's first—NAHB Green Building now and Thompson is starting on his in 2009.

In addition to helping Zimmerman troubleshoot the first NAHB Green Building in the High Country, the High Country Homebuilders are hosting a course on how local builders can achieve designation as a NAHB Certified Green Professional on Wednesday, Thursday and Friday, November 5, 6 and 7. The course is a response to Rob Holton, board member of the Watauga County Tourism Development Authority and Watauga County Economic Development Commission, who wants to designate Watauga County as a "green county." Holton was trying to figure out how to advertise Watauga County's green builders to a wider market, and Zimmerman suggested hosting a certification course so as to erase any gray area and give incoming buyers an assurance that their High Country home was built to national green standards.

"High Country Homebuilders really stepped up to the plate to provide some leadership in the building community [by establishing the Green Building Committee] because it's a hard time for builders right now," added Zimmerman.

The Green Machine—The High Country's First NAHB Green Building



Three years ago, a family from Raleigh purchased a home site in the Fleetwood Falls neighborhood, hoping one day to build a home for retirement on the property. In December 2007, the family decided it was time to build and called an area architect and an area builder, inviting both to come walk the property.

"This was really great on their part—they invited both of us to meet at the property to discuss what was to be done," said Zimmerman.

The family chose architect David Hill, who now owns Verdi Architecture in Charleston, S.C., and Zimmerman to complete the job. At the time, the family wanted a home with large gathering places for family and, although they did want the house to feature some passive solar gain, they weren't sold on the green idea.

On July 1, Zimmerman and his four-person crew broke ground at the site. Hill's design is a spacious 2,000-square-foot, two-story, four-bedroom abode with vaulted ceilings and a basement. Hill and Zimmerman made sure to orient the house to make full use of the sun, and Zimmerman added green elements, such as a Ductless Mini-Split Heater that was installed to

rid the house of ductwork because some of its future inhabitants have allergies.

In August, though, the homeowners decided they wanted to make the house as green as possible, forcing Zimmerman to play catch-up.

"It's important for homeowners to make that decision right off the bat so they can take advantage of the entire building cycle," said David. "They can earn points [toward their home's green score] if they start at the beginning."

Being chair of the High Country Homebuilders Green Building Committee, Zimmerman jumped at the chance to make the home the first NAHB Green Building in the High Country. Using NAHB's online green scoring tool and the intellectual troubleshooting of David, Zimmerman added green elements to every facet of the house, hoping to still reach a high NAHB Green Building ranking even though the change of focus came in the middle of construction.

Zimmerman racked up points because the site was undeveloped when he began construction and it was already in an existing neighborhood, a concept the NAHB calls "in-filling." He decided to make the house Energy Star—the federal government's energy efficiency rating—which also added to his points. And then the creativity came into play—creativity that makes the home more efficient as well as more comfortable to live in.

"The benefit of all of this is personal health," said Zimmerman.

Zimmerman found finger-jointed studs, or studs made from 2-by-4 cutoffs recycled from other construction job sites, and employed them in the house's walls. He used recycled sheathing made from recycled cardboard and foam to wrap the house, and used a pre-finished siding made from wood fiber and silica to protect the house from the elements.

Instead of regular floor joists, Zimmerman used oriented strand I-joists to complete the home's sub-floor system. Oriented strand I-joists take smaller pieces of weaker, faster growing trees—such as Aspen—and arrange them in a manner that promotes strength. Trees such as Aspen re-grow faster than hardwoods, thus they are a more sustainable choice.

To give the house the highest possible energy rating, Zimmerman insulated the ceilings of the home with spray urethane, a material with a high content of sugarcane and a low content of petroleum—in fact, the lowest content of petroleum on the market. Spray urethane, however, costs more than the blown fiberglass he used for the interior walls of the house. So, since recycled sheathing is used on the exterior walls of the house, Zimmerman chose to save the homeowners money and used blown fiberglass on the interior, without compromising energy efficiency. All of these measures gave Zimmerman points toward the grand total.

Also, Zimmerman chose a galvanized roof for the home. The galvanized roof reflects the sun's radiation so the house stays cooler and the homeowner can save money on his/her power bill. For flooring, Zimmerman chose formaldehyde-free OSB because it doesn't absorb moisture and mold won't grow in the house.

Zimmerman equipped the house with a tankless propane water heater that only heats water on demand so the homeowners don't have to heat water while they are away for months at a time. And the best part—the hot water never runs out.

"This is the perfect setup for a home that will go from no one living there to eight adults in a matter of hours," said Zimmerman.

Zimmerman added R30 insulation in the home when code called for R19, a decision he thinks makes a house more pleasant to live in. Zimmerman and David also did some troubleshooting to figure out how to outfit the home with an un-vented attic assembly, citing that vented attics create huge temperature differentials year round, causing a home to be less energy efficient. The duo figured out how to spray blown fiberglass into the open attic spaces, thus getting rid of any chance of huge temperature differentials.

Zimmerman also took advantage of the angle of the house in relation to the sun, creating a basement that is passive solar heated. He installed blue board below the basement's concrete slab that helps store heat. He did the same thing upstairs, all with the help of Adrian Tate of Green Mountain Design who created a 3-D computer model of the position of the sun in relation to the house during an entire year.

Zimmerman sealed the bottom plates and top plates of the house with caulk to inhibit heat loss, and he added a Super Fan—a whole house forced air fan—to push hot air out of the house in the summer. The Super Fan is supposed to cut down on the number of days that a homeowner needs to turn on the air conditioning.

"You really don't understand how much we've pushed the envelope with this house," added Zimmerman, who said that 25 people came to the house for a site visit recently just to see all the work and new ideas put in place.

Zimmerman gives a lot of credit to Building Performance Engineering—a business he believes gives the High Country a leg up on other regions in terms of green building.

"I feel we have an opportunity in the High Country that other areas do not," said Zimmerman. "Building Performance Engineering is one of probably a half-dozen companies at this level nationwide—it's a national level program.

"People need to understand that green building equals quality building. Green homes provide better comfort, durability, air quality and health and reduced operating costs—people just get a better house," said Zimmerman.

For more information, call Zimmerman at 828-265-4123 or 828-964-3419 or David at 828-265-4888. For more information on the NAHB National Green Building Program, click to www.nahbgreen.org.

High Country Homebuilders Association Hosts NAHB Certified Green Professional Designation Courses November 5, 6 and 7

In order to certify local builders with the NAHB Certified Green Professional Designation, the High Country Homebuilders are hosting two courses from November 5 to 7. Builders must take and pass both courses and have a minimum of two years building experience to gain the

designation.

Michael Chandler of Chandler Design-Build acts as the instructor for both courses. Chandler has been building solar and green homes for more than 30 years and worked with the NAHB-ICC ANSI standard task group to help create the new National Green Building Standard.

On Wednesday and Thursday, November 5 and 6, the High Country Homebuilders are presenting the two-day course NAHB's Green Building for Building Professionals. The course takes place from 9:00 a.m. to 5:30 p.m. on both days at Builders Plaza, located at 755 Highway 105 Bypass in Boone. The cost of the course is \$225 for NAHB members if they register before October 1 and \$275 if they register after October 1. Non-members pay \$275 prior to October 1 and \$325 after October 1. For more information or to register, call Susan at 828-297-6566.

On Friday, November 7, the High Country Homebuilders are presenting the one-day course NAHB's Business Management for Building Professionals. The course takes place from 9:00 a.m. to 5:30 p.m. at Builders Plaza, located at 755 Highway 105 Bypass in Boone. The cost of the course includes lunch and is \$175 for NAHB members and \$225 for non-members. For more information or to register, call Susan at 828-297-6566.