

Home, Straw Home!

Straw-Bale House Supports Sustainable Lifestyle for Gays Mills Family

If you set out to visit a house made of straw, several images might come to mind—perhaps a quaint little hut set deep in a remote jungle, or maybe a miniature house of straw settled precariously next to a house of sticks, with the Big Bad Wolf lurking nearby.

Whatever image comes to mind, it's probably not the one that comes into view at the end of the driveway to Kevin Schmidt and Scarlet Welander's rural Gays Mills home on Scenic Rivers Energy Cooperative lines. This beautiful two-story house is made of straw? Can't be.

But it is. Kevin, his wife, Scarlet, and their 3-year-old daughter, Emma, live about as close to the Earth as a family possibly can while still enjoying all the comforts of a modern home. Their house was built with straw-bale construction, an old technique that is seeing a revival among those seeking environmentally friendly homes built with sustainable sources. The stucco plasters protecting the straw bales are made of mud, chopped straw, sand, and lime. The house's main furnace is the sun; a passive and active solar heating system provides much of the family's heating needs. The building's design, created to work in rhythm with the natural environment, allows for maximum use of natural lighting, passive cooling, exceptional air quality, and cross-ventilation.

Old Method With a New Twist

Although straw-bale construction is an uncommon building method in today's world, Kevin pointed out that a straw home is not really that unusual, and it's certainly nothing new.

"We're using techniques and materials that have



To see what lies within the walls of Kevin and Scarlet's home, take a peek through one of two "truth windows," which allow a view inside. Straw-bale home construction is most often seen in western states where the climate is drier, but the method can be adapted to meet Wisconsin's climate as well.



Scarlet Welander, Kevin Schmidt, and their daughter, Emma at the front door of their straw-bale home.

been used by barn swallows, beavers, mud-daubers, and of course people for thousands of years," he noted.

Kevin and Scarlet's unique home was designed and constructed by Todd Osman of Driftless Design in Gays Mills. Todd has designed and built homes of all types, but he focuses on sustainable methods. He built the original portion of Kevin and Scarlet's home 14 years ago using post-and-beam construction, typical of most straw-bale houses. With this method, a wall frame is built with long beams and filled with straw bales, covered with chicken wire, and coated with some sort of plaster, usually cement.

Kevin and Scarlet bought the property in 2002 with an eye toward creating a lifestyle that's in harmony with the natural surroundings. As their need for more than the original 864 square feet of living space grew, they turned to Todd to design and build a 1,600-square-foot addition that would stay true to the original building while employing some more familiar construction methods.

"We knew if we wanted to build this addition as a



Above left: Ten solar panels collect energy from the sun to provide heat for Kevin and Scarlet's home. The home's design also makes the most of passive solar power. The north-facing side (left) has sparse, small windows, while the opposite side (above) has much larger windows to take advantage of the southern exposure. Large overhangs help control the solar heat gain during the summer. The galvanized steel around the base of the house provides additional protection from the sometimes harsh weather conditions in Wisconsin.

prototype we'd want it to be normalized somewhat so a mainstream builder could wrap his mind around it," Kevin explained.

Although still made with straw, the addition has a more familiar stud frame instead of posts and beams. The exterior walls are covered with a lime plaster, and interior walls are covered with a plaster made of clay soil, chopped straw from local farms, sand from the Mississippi River, linseed oil, and water. "It's basically mud," Kevin said.

Any concerns of whether this type of construction is durable enough for Wisconsin's wet climate were put to rest when a wall of the original portion of the house was opened up as construction began on the addition in May 2007. Kevin said a crowd of onlookers was on hand for this moment, curious to see if the straw bales stacked between the oak posts were still dry after 14 Wisconsin winters. The straw, he said, was so dry it was "crispy."

However, to provide additional protection from the elements, the base of both of stories of the addition were covered with about three feet of galvanized steel.

Harnessing the Sun

First priority in designing the house, Kevin explained, was to work with the sun. Although there is no bad view on the ridge where the family lives, the most jaw-dropping vista overlooks the valley below. However, the main portion of the house faces away from that sight.

"That's the best view, but we really just blew it off

because that's the east and you don't get any sun from that direction after 10 or so in the morning," Kevin said. "We wanted the southern exposure."

Still, simply facing the south isn't enough. The trick to an effective passive solar system is to make the most of the sunshine in the wintertime and control it in the summertime. This is achieved by strategic window placement; windows on the northern side of the home are small, while the southern side is abundant with windows that are noticeably large. Also, the windows have large overhangs above them, which keep too much heat from beating through the windows during the summer.

Kevin estimates the passive solar heating system alone provides between 10 to 20 percent of the house's heat, depending on the time of year. In fact, he noted that during construction this past winter, even before the ceilings were insulated, they only burned a bit of popple slab on the cloudy days. The solar gain and wood heat were soaked up and stored in the massive tonnage of clay plasters on the straw walls. Then this heat would slowly radiate back into the house over the next 12 to 24 hours.

"If it was a sunny day, it didn't really matter how cold it was," he said. "The sun could compete with a 20 or 30-degree day just because of the southern exposure, passive solar gain, and thermal mass."

In addition to the passive solar system, Kevin and Scarlet's home relies on a solar hot water system. In the

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Scenic Rivers Energy Cooperative



Kevin and Scarlet's home was designed with an open floor plan that makes maximum use of natural lighting and uses mostly natural materials. The wood used in the trim was all harvested from the woods on the property; the floor is red oak, the ceiling is aspen, and much of the trim is black cherry and hickory. At left is the hallway into the original portion of the house, where the bedrooms are now located. Inset are transom windows set high in the walls of the bedrooms, which provide ventilation and allow some of the heat entering the bedrooms into the home.

Straw House

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south-facing yard are 10 solar panels stretching over 50 feet. These panels collect the energy from the sun to heat a liquid solution, glycol, which is transported by electric pumps into an 800-gallon storage tank in the home's basement, which operates as the heating system's battery. True to the family's "recycle, reuse" philosophy, the tank is actually an old milk tank.

The heat collected here is distributed throughout the house with a standard forced-air heating system. This system provides heat for domestic hot water use and also heats the slab floor by way of an in-floor heating system.

"The slab floor is another battery," Kevin explained. "The purpose here is not just to be able to live comfortably in the basement, but the slab floor radiates heat back into the whole house in the coldest part of the winter."

For backup, there's an electric water heater and a wood stove. Since the family hasn't yet lived with the system through an entire year's heating cycle, it's difficult to precisely determine just how much of the family's heating needs can be supplied by solar power alone. However, Kevin said if the water in the tank and the slab floor are both fully charged from the solar hot water system, they hope to be able to heat for a week of cloudy days by drawing heat off of those two heat batteries of thermal mass.

Kevin credits John Murphy (Green Home Solar, Viroqua) for the solar installation.

"Serious brain power! Johnny knows physics," Kevin said. "It was like having McQuiver and Einstein working together on that project in the basement."

Interior Energy

The home's interior also makes maximum use of the sun's energy. The new addition was designed with an open floor plan that allows the sun to fill the entire home with light, eliminating the need for most artificial lighting during the daytime. The original portion of the home now houses the bedrooms. To keep these smaller rooms from overheating, the walls to the hallway have transom windows high up near the ceiling. These windows provide ventilation for the bedrooms and let some of the heat coming in through the large bedroom windows into the hallway beyond.

The open floor plan also provides for cross ventilation throughout the home, which contributes to the superior air quality inside.

"We've got great air quality partly because of the cross ventilation, but also because our materials are incredibly benign," Kevin said. "This is a very nontoxic house. It's mud, sand, straw, and wood."

Healthy Living, Inside and Out

A house like Kevin and Scarlet's is not only good for a person's physical health, but it's good for spiritual health as well. Living in harmony with the natural surroundings, Kevin noted, lends itself to living in harmony

with the people within those surroundings as well. An open floor plan helps facilitate togetherness since there are fewer separate, isolated spaces for individuals to retreat to for extended periods of time.

Even some of the separate rooms of Kevin and Scarlet's house were designed with human connections as well as environmental connections in mind. Still to come is a three-season kitchen separate from the main kitchen for canning the family's homegrown vegetables. With a comfortable and convenient work space, a chore like canning can become more of a family/neighborhood event, with many people working together. The finished produce will be stored in two large root cellars under construction in the basement. The root cellars are designed to be independently controlled for temperature and humidity.

Also still in progress is an independent living space in the upper level of the home's new addition. Currently a sunny open room where Emma plays while her mother spins wool from the family's sheep, the upper level will eventually have a separate bathroom and comfortable living quarters for extended guests.

"We're designing a living space that can accommodate a number of people that extends beyond our immediate family," Kevin said. "That way we can teach and learn about this type of living by having family members or friends stay with us for weeks, even a summer."

Long-Term Rewards

These nontangible paybacks—satisfaction from living harmoniously with nature as well as a healthy home environment—are among the riches one can expect from a straw-bale home. It isn't the house style to choose if the goal is simply to cut expenses.

"Todd always says that any new home is expensive to build if you build it well," Kevin pointed out, "but when you're dealing with materials that are out of the ordinary, the costs do go up. Cost depends on time frame. In the long term, this house is really cheap because it's going to last a really long time, and our fuel bills will be very low. Think long term—it ain't illegal yet!"

Kevin and Scarlet's straw home is certainly not what you'd expect. It's really much more.—*Mary Erickson* ■

Kevin and Scarlet can be reached at redmaple@mwt.net. They are available for tours of their home as well as discussion and consultation about solar and alternative home building. They also provide referrals for local natural builders and materials sources. Their home is listed and described in the International StrawBale Registry, sbregistry.greenbuilder.com.

Proper CFL Disposal

More and more members are replacing their incandescent light bulbs with compact fluorescent lights (CFLs). Some, however, are concerned about the small amount of mercury CFLs contain.

"Consumers' biggest concern is the impact of the mercury vapor that can be released into household air when a CFL is broken. In fact, the amount of mercury in a typical CFL is not enough to coat a head of a pin," according to John Bachner, communications director of the National Lighting Bureau.

Still, if you should happen to break a CFL bulb, take the following precautions:

- Open a window and leave the room for 15 minutes.
- Use a wet rag to clean up and put all of the pieces, and the rag, into a plastic bag. Place that bag into a second sealed plastic bag.
- Wash your hands.
- Bring the sealed bag to one of SREC's offices, where a CFL recycling receptacle is set up for members' convenience. Please drop off your burned-out bulbs here as well instead of throwing them in the trash. ■





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231 N. Sheridan St. Lancaster, WI 53813 (608) 723-2121 800-236-2141 lancaster@srec.net	427 Main St. P.O. Box 127 Darlington, WI 53530 (608) 776-4415 800-236-6656 darlington@srec.net	303 Main St. Hwy. 171 P.O. Box 158 Gays Mills, WI 54631 (608) 735-4313 888-735-4314 gaysmills@srec.net
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