

Terry Schager stands alongside one of the handcut log posts he fashioned for his porch at his Gowensville home. (photo by Jeff Byrd)

## Gowensville homeowner to describe physics of Energy Star home at Upstate Forever seminar tomorrow

by Jeff Byrd

Terry Schager built his 5,200-square-foot Energy Star log home in Gowensville a year ago based on several theories - thermal mass, super insulation and a "tight envelope."

For the past 12 months, he has taken the place on a sort of physics test drive.

The results are better than he expected. His highest monthly electric bill last winter was \$107.

"This house is a curiosity to me," he says. "Our one year anniversary of moving in is this week. Like a sports car, we put the house through its paces this past year. I knew in theory all this stuff should work."

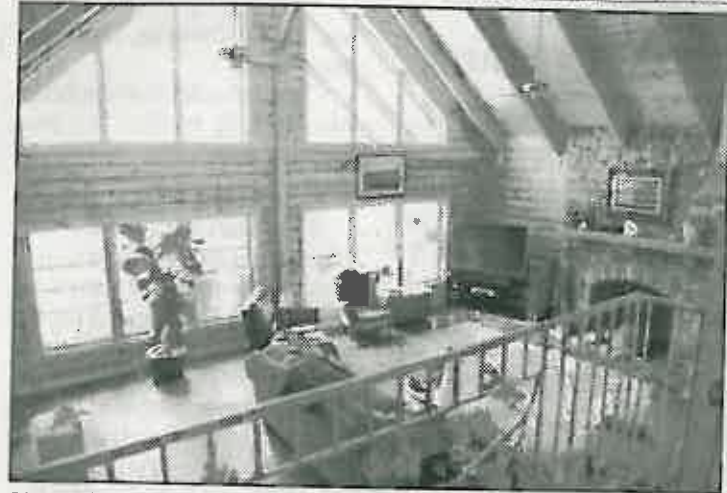
Tomorrow, Schager has been invited to describe the energy concepts he employed - and the results they achieved

- to tradespeople and interested homeowners at a workshop being sponsored by Upstate Forever, the S.C. Energy Office and the S.C. Chapter of the United States Green Building Council and the Sustainability Institute.

"Saving More Than Money: A Workshop to Highlight Energy Efficiency and Green Building" will be held Thursday, from 1 to 6 p.m. in the Barrett Room of the Spartanburg County Public Library. Six speakers will address topics from sustainable architecture to remodeling. To register for this free event, call Upstate Forever at (864) 327-0090.

Schager cut his log home teeth restoring Gordon Wright's Cabin in the Pines, along with his wife, Stacey Lindsay, county executive for Carolina First Bank in Tryon. Wright was well-known in the

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The main floor of the Schager, Lindsay house is made of three inches of mortar and Pennsylvania bluestone. A wood stove in the basement heats the floor and it radiates heat throughout the house. It also stores up cool air in summer. (photo by Jeff Byrd)

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area as the longtime Master of the Hounds for the Greenville hunt.

### Five friends

"We bought the place as a weekend home and soon discovered two things, the house was a mess and we wanted to live there fulltime," Schager recalls.

For most of us, these realizations would mean only one thing: Get out your checkbook.

But Schager is not your average homeowner. Lindsay told her mother not long after the pair met, "Mom, he can fix anything!"

Schager has an engineering mind by genetics and a self-reliant streak gained in the blue-collar environment of his native northwestern Pennsylvania.

The genes come from his grandfather, who won the patent in 1955 for the lens system that combined light beams in the back of a color picture tube while working for Sylvania. His father was a tool and die molding engineer.

Schager became a systems engineer after earning a degree in computing science from the University of Pittsburgh. He moved to Greenville in 1985 to work for Fluor Daniel, later for Bowater, and now consults for corporations in his area of expertise, electronic commerce in inventory and purchasing systems.

But he is no computer geek

with the pocket protector and slide rule.

"I grew up in that blue collar background (of western Pennsylvania). Folks were self reliant, self determined. My neighbors' dads were the kinds of guys who would get five friends together, buy a case of beer, and decide to go build a bridge this weekend," he says.

Schager and Lindsey came to

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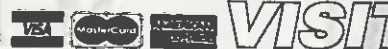
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Gowensville in December 1992, just before the blizzard.

"I knew we needed a garage," he recalls. Three months later, "The Blizzard of '93" dropped eight acres of pine trees on his neighbor's land next door. He bought antique tools and hand-peeled about 60 of them, let them dry for nine months and built a four car garage. He dismantled an old house in Little Chicago for the tin roof and other building materials. The end result was a garage that looked 100 years old.

So, when Schager started researching how to restore the Cabin in the Pines, as you can imagine, he absorbed the details. At the time, the gaps between the logs allowed enough wind through to blow out a candle. Schager replaced rotten logs,

and all the chinking, insulation and roofing.

"I started understanding things like notching systems, log profiles and overhangs," he says.

### Northern White Pine

Four years ago, Schager and Lindsay decided to sell the Cabin in the Pines and build something new, this time, "engineering the systems."

After "looking at log home designs forever,"

he liked Alta Long Homes of Halcottsville, N.Y., manufacturers of the only Energy Star rated log homes on the market, Schager

says. Energy Star is a U.S. Government program begun in 1982 to seek a 15-30% improvement in energy efficiency.

Alta corporate officials liked Schager as well, once the company learned how much he knew about log homes, and asked him to become a dealer. He agreed and formed his company, Laurel View Log Homes. He hopes to take what he has learned in his own home and be on site helping to apply the same concepts to new homes built for others.

That would be three basic ideas. First, there is "thermal mass," that is any material that has the capacity to store heat. When used correctly, such materials can significantly reduce the requirement for active heating

*"The concept of 'thermal mass' is nothing new. They built stone walls three feet thick in the 13th Century.."*

- Terry Schager

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and cooling systems.

Schager points out that Alta uses White Pine farmed in the Catskills in New York. "Northern White Pine is dense, slow growing. It gives better thermal insulation. The logs are air-dried for 18 to 24 months, so they have fewer checks because the log shrinks more slowly."

To Alta's 8x8 Frontier log walls, Schager added a thermal mass idea of his own, a ground level floor three inches thick made of mortar and Pennsylvania bluestone.

A relatively small, Vermont Castings woodstove located in his basement heats the slab in the winter, and the slab and the logs radiate heat through the house, naturally regulating the temperature between 68 and 72 degrees.

In the summer, he opens a strategic group of windows to bring the cool night air through the house, cooling the slab and the pine walls. Around 9 or 10 a.m., the windows are closed and the house stays cool all day. When the late afternoon sun starts to pour through the windows, Schager says the heat pump air-conditioning might cut on briefly.

### R65 Insulation

"The concept of thermal mass is nothing new," Schager says. "They built stone walls three feet thick in the 13th Century to employ the concept. I am just using different materials."

Schager's house is positioned facing southwest on his lot in Gowan's Fort to make the best use of the sun, winter and summer.

To reach the efficiency levels he sought, Schager also employed two other concepts, super insulation and a "tight envelope." He used 6.5 inches of "polyiso" foam board insulation made in Greer in the ceiling, an amazing R65 factor insulation. In his basement, he employed Insulated Concrete Form (ICF) blocks, also R65.

To complete the package,



Terry Schager holds up an insulated Concrete Form (ICF) block used for the walls of his basement. Two foam panels are clipped together by metal forms, then rebar is clicked into place in those forms and the blocks are then set on top of one another and concrete is poured through the middle. The result offers an R65 insulation value. (photo by Jeff Byrd)

Schager had Andersen 400 series Low E windows and Andersen KLM doors installed. Put it all together and you have a "tight envelope."

With that envelope, he can employ passive solar heating and convective cooling. The house can trap the sun-generated heat inside in winter, and evacuate heat out second story windows in summer to suck up the cool basement air. Once inside, both the heat and the cool temperatures are stored by the thermal mass of his building materials and recirculated for hours.

Pretty sweet.

"This place is really energy efficient," Schager says. "We are saving money now and, as energy prices rise, this is only going to become a better investment."

Schager says he is expecting a 20 to 30% increase in Blue Ridge Electric rates within the next couple months and about 5-7% more a year for some years to come.

"Our highest electric bill last

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# "Moose"

## 1979 - 2008

~ My Hero ~



Schager, seen at his Energy Star log home in Gowan's Fort, will be giving a talk on energy efficiency concepts at a workshop tomorrow in Spartanburg. (photo by Jeff Byrd)

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winter was \$107. The heat pump only came on five days last winter, while Stacey and I were on vacation," Schager says.

Neighbors of his with 2,800 square foot houses reported paying \$350 a month. The Cabin in the Pines, his old house, had higher electric bills with just 1,500 square feet of heated space.

That new house electric bill - it includes the cost of powering three refrigerators, a freezer, a pool and a washer and dryer.

### 'Not sure it would work'

"Other than those appliances, the only electric usage in the house is when the heat pumps come on in the summer to cool the house," Schager says.

His hot water comes from a Paloma tankless 7.4 gallon per minute water heater. The propane tank, which supplies the energy to heat water only as it is called for, was filled once this past year, for \$440.

The highest electric bill Schager paid this summer was \$152.

Schager will describe all this to builders and homeowners tomorrow. The cost of adding these energy efficiency features was not that much, he says. The ICF panels in the basement cost the same as poured concrete.

Adding a second layer of polyiso in the roof cost an extra \$4,000 to \$5,000, he says, but Schager figures the savings the extra insulation provides will pay that back in 18 months.

"When I built this, I was not sure at all this would work," he says. Now, he is excited to see what it can do in other models and locations.

"If we can get these numbers with a house this big, if you eliminated the master wing, and had the same type of energy and performance, you could get the electric bills down to \$50 to \$60 in the winter, and \$100 max in the summer."

Perhaps with a keg, and five friends, and a long weekend.....



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