

Building for Efficiency

Properly insulated homes with few air leaks are one of the hallmarks of energy efficient construction.

by **Brenda Kleinjan**

RESearch. INVESTMENT. PATIENCE. ALL ARE characteristics needed for developing a vineyard and for building an energy-efficient home.

Randy Sarvis of Pierre, S.D., can testify to that. Sarvis' investment is for the long haul. Though started in 2002, his winery isn't scheduled to open until the summer of 2008 and his home is built with energy efficiency – and future cost savings – in mind.

Located north of Pierre and surrounded by the rolling hills that form the eastern slope of the Missouri River valley, it's easy to imagine winter's winds sweeping through the vineyard and hitting Sarvis' home unhindered by trees or neighbors.

"The winter is pretty brutal here on the prairie. In town when it's 40 to 50 degrees out, people start wearing shorts, out here we're still wearing Carhartts. We wanted the house to be a little haven," said Sarvis, who built the home and vineyard along with his wife, Nita.

For Sarvis, comfort was one motivator in making more energy efficient choices in his new home.

Sarvis' home has many of the characteristics recommended by national homebuilding standards for energy efficiency laid out by both the Department of Energy's Energy Star® Home program and America's electric cooperatives' Touchstone Energy® Home program.

"I don't know what a person could do to make a home more energy efficient," said Sarvis. "We felt it was the right thing to do."

Some of Sarvis' choices added upfront costs to the construction – such as the high-e windows and the structural insulated panel construction method that forms the walls of the structure. Light fixtures complete with energy-saving compact fluorescent bulbs and a humidity control system also contribute to the home's efficiency.

"If you look at the numbers and do the data research, it makes sense. We figured it into our building budget," said Sarvis.

Those choices are already yielding energy savings for Sarvis.

"I think we're starting to see energy savings already. Our heating and cooling costs are really





low,” said Sarvis, who enclosed their home in April 2007 and continue to finish the home.

This past summer, while outdoor temperatures hit triple digits, the Sarvis’ only ran their air-conditioner once and that was to increase comfort for those helping harvest the vineyard’s grapes.

“The only time we used our AC was when we did our harvest out here – turned it on and ran it down to 70 degrees,” said Sarvis, who noted they called off one day of grape picking due to the extreme heat.

The Sarvises have two buildings using the SIPs construction and are looking at constructing a third. The vineyard’s first building was the wine tasting room which was built in 2003.

“Without any heating and cooling, even with doors and windows open, it’s 10 degrees cooler in the summer and when it’s cold, you can really tell the difference,” said Sarvis.

One of the functions of the SIPs is that all the seams are taped and filled during construction.

“The seams are taped during construction phase to finished phase, everything is foamed outlets to outside are foamed – wires to AC unit, water outlets are all foamed,” said Sarvis.

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“It may cost a little more up front, there’s a tremendous amount of comfort – you don’t feel hot and cold spots nor breezes,” said Sarvis.

Opposite: Randy Sarvis stands in his ChrisaMari Vineyard. The energy-efficient home he and his wife, Nita, are building overlooks the vineyard north of Pierre, S.D. **Above:** The Sarvises will heat their home with radiant floor heat from an electric boiler in the basement. They vineyard’s tasting room was also built with energy efficient walls and an air-source heat pump.

Touchstone Energy® Home Program Standards

Qualifications:

To qualify for Touchstone Energy Home certification, an electric heat pump(s) and water heater(s) must be installed in dwellings meeting prescribed criteria. Each home must meet the Touchstone Energy Home energy-efficient features to qualify. Speculative builder and multi-family units must incorporate the same Touchstone Energy® Home features as new construction homes.

The Touchstone Energy Home features incorporate energy-saving features into building and remodeling plans. The Touchstone Energy Home features are:

- 1 R-16 wall insulation minimum
- 2 R-38 attic insulation minimum and R-25 for roof/ceiling applications
- 3 Attic ventilation required
- 4 Recommend R-19 floor insulation for closed and opened crawl spaces
- 5 Double pane windows required, metal windows must have thermal break
- 6 Metal insulated doors
- 7 Infiltration control required
- 8 Electric heat pump required
- 9 Electric water heating required
- 10 Exhaust system in kitchen and baths
- 11 Exterior house wrap
- 12 Recommend duct be located in conditioned area

Features of Energy Star® Qualified New Homes:

To earn the Energy Star, a home must meet guidelines for energy efficiency set by the U.S. Environmental Protection Agency. These homes are at least 15 percent more energy efficient than homes built to the 2004 International Residential Code (IRC), and include additional energy-saving features that typically make them 20 percent to 30 percent more efficient than standard homes.

Any home three stories or less can earn the Energy Star label if it has been verified to meet EPA’s guidelines, including: single family, attached, and low-rise multi-family homes; manufactured homes; systems-built homes (e.g., SIP, ICF, or modular construction); log homes, concrete homes; and even existing retrofitted homes.

Energy Star qualified homes can include a variety of ‘tried-and-true’ energy-efficient features that contribute to improved home quality and homeowner comfort, and to lower energy demand and reduced air pollution:

- 1 **Effective Insulation** – Properly installed and inspected insulation in floors, walls, and attics ensures even temperatures throughout the house, reduced energy use and increased comfort.
- 2 **High-Performance Windows** – Energy-efficient windows employ advanced technologies, such as protective coatings and improved frames, to help keep heat in during winter and out during summer. These windows also block damaging ultraviolet sunlight that can discolor carpets and furnishings.
- 3 **Tight Construction and Ducts** – Sealing holes and cracks in the home’s “envelope” and in heating and cooling duct systems helps reduce drafts, moisture, dust, pollen, and noise. A tightly sealed home improves comfort and indoor air quality while reducing utility and maintenance.
- 4 **Efficient Heating and Cooling Equipment** – In addition to using less energy to operate, energy-efficient heating and cooling systems can be quieter, reduce indoor humidity, and improve the overall comfort of the home. When properly installed into a tightly sealed home, this equipment won’t have to work so hard to heat and cool the home.
- 5 **Efficient Products** – Energy Star qualified homes may also be equipped with Energy Star qualified products – lighting fixtures, compact fluorescent bulbs, ventilation fans, and appliances, such as refrigerators, dishwashers and washing machines.
- 6 **Third-Party Verification** – With the help of independent Home Energy Raters, Energy Star builder partners choose the most appropriate energy-saving features for their homes. Additionally, raters conduct onsite testing and inspections to verify the energy efficiency measures, as well as insulation, air tightness and duct sealing details.