

## Off the grid is on the mark for Dover doctor

Green building is combination of high-tech and common sense

By **Doug Denison, Staff Writer**

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Dover, Del. — For most people, making a “greener” home means installing a programmable thermostat, running the dishwasher less, maybe replacing those 20-year-old windows.

But off a quiet rural road near Magnolia, Dr. Robert Varipapa is building what could be the most energy-efficient home in Kent County, and likely the entire state.

The Dover neurologist’s new house will be completely disconnected from the utility grid and will be powered entirely by an array of solar panels mounted on the roof of the garage.

It will be heated and cooled by a network of geothermal wells drilled 200 feet into the ground, working in concert with a hot air heat exchanger that circulates air warmed by the sun over tubes of water in the walls, which hold the heat and normalize the temperature of the rooms when the sun goes down.

Every part of the design of the 3,000-square-foot, two-bedroom house is carefully selected for maximum efficiency and minimum environmental impact.

Much of the house is made of renewable, sustainable materials. Most of its exterior walls are made from bales of straw, coated on the inside, and outside with a mixture of sand and clay.

Varipapa’s \$500,000 building is meant to be one of a kind.

“I guess I kind of like to think on the edge and try new and different things,” he said. “I bought this property about two years ago and really just fell in love with it. I decided I wanted to put a kind of special house on it.”

Varipapa said the decision to go with all the latest and greatest green technology was an easy one for him.

“I’m kind of a gadget nut. The thought with the solar was, ‘Well, if we’re going to build a house like this that’s very energy efficient, why not go all the way?’” he said.

General contractor Gary Stiewing, of Rising Sun Woodworks in Annapolis, Md., said the house may have all the latest bells and whistles, but what really makes it “green” are the eco-friendly materials it’s built with.

“What makes it sustainable is the straw. It’s farmed only a few miles away and the clay comes from over behind Barratt’s Chapel,” he said. “It’s a lot less energy to get that product to our site. The less miles you’re shipping materials, the less energy that’s used, the more the house becomes a smart home.”

The architecture of the house also makes the best use of natural heating and cooling principals, said Steve Kemble, whose company MudStrawLove is responsible for building the walls.

“There’re all these systems in place, but the main thing with this house that’s going to keep it comfortable all year round is the fact that you’ve got passive solar design,” he said. “A lot of windows facing south and an overhang, and the fact that you’ve got these super insulated straw bale walls.”

Kemble said an 18-inch thick straw-bale wall has an insulating value of about R-45, more than three times that of a normal framed wall filled with the familiar pink fiberglass insulation.

Even though the house costs roughly twice as much a similarly sized conventional building, Stiewing said there’s a very real possibility the built-in efficiencies could pay for themselves in the future, at least in part.

“It’s kind of an experiment, depending on how energy prices go,” Varipapa said. “If energy prices go up, it might pay for itself sooner, and they’re probably not going to go down. But, I didn’t do it just to save money.”

Stiewing said that spirit will help carry the green building movement along, but the world is going to have to change dramatically if homes like this are to become the norm.


“This is not the answer,” he said. “The answer for all of us is to learn how to live with a lot less.”

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Dr. Robert Varipapa, center, stands with Sam Geishert, left, and Talitha Daddona, two interns with MudStrawLove who came to help build the 3,000-square-foot straw-bale walls that enclose much of his new "green" house. The bales are stacked between the house's framing timbers, then coated inside and out with a mixture of sand and clay.

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Doug Denison photos

This 3,000-square-foot house being built by Dover neurologist Dr. Robert Varipapa is designed to live totally off the grid. It will be powered by solar panels and is designed for maximum efficiency and minimum environmental impact.

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General contractor Gary Stiewing, left, examines a section of straw-bale wall laid by Steve Kemble of MudStrawLove. Kemble's firm built the super insulated walls with help from 12 volunteers.

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The interior of the house consists mostly of a two-story great room with a barrel-vaulted ceiling. The space will be heated and cooled by geothermal wells and passive solar design.