

# Modern technology, traditional design

Energy efficiency a growing trend By Sloan Brewster Staff Writer The Valley Press May 27, 2010

A house on Avon Mountain will be a marriage between traditional construction and modern technology. In building such a home, David Gordon is achieving his goal of incorporating fuel efficiency into a new house made in a colonial design. A big hurdle in making his aim a reality is dealing with the pitched roof. Most energy-efficient houses are contemporary, he explained, with flat roofs, which are conducive to solar panels and such. He cited as an example Bernie Zahren's house which is under construction at 40 Gibraltar Lane on Talcott Mountain. "The way it's designed, it incurs so many things that we're trying to do, but because of our pitch [it's more difficult]," Gordon said.

Homeowner Zahren is expanding and renovating the 50-year-old home where he has lived for 10 years. In December 2009, Zahren installed a 100-foot, 2,000-pound turbine with which he plans to power the home. Zahren is making the 5,000-square-foot home energy efficient in order to qualify for Leadership in Energy and Environmental Design [LEED] Certification and will use sustainable fuel whenever possible. Zahren, who said he has a passion for sustainable practices, expects to get 100 percent of the power for the home from wind. "It's a big enough unit, it should do somewhere, we hope, around 25,000 kilowatt hours a year," Zahren said. While most big homes use more than 2,000 kilowatt hours a month, Zahren said he expects his house will use a good deal less because it will be "such a tight house," meaning it will be extremely energy efficient.

Unlike most energy-efficient homes, including Zahren's, Gordon will not have a flat roof. "What we're trying to do is, we're trying to build a traditional colonial looking house that is extremely energy efficient, which is challenging," Gordon said. "We're trying to see if our house is as efficient as a modern looking house." Zahren, while he said he is unfamiliar with the house on Deercliff, agreed the pitch in the roof would be an obstacle. "[Gordon] is right," Zahren wrote in an e-mail. "Roofs, especially with shingles on them and facing the sun, are hard to keep cool. We have flat roofs, with R60 insulation and lighter colors for roofing material – Sarnafil – which is usually used on commercial buildings. Plus we have a lot of decking on the flat roof areas, so that is an additional barrier to heat retention." Gordon is well on his way toward overcoming the challenge and this month he laid the foundation on a 6,500-square-foot home which he plans to move into in March of 2011.

He plans to use geo-thermal and solar-thermal technology to heat and cool the home. Four solar thermal panels on the roof and 45 solar photovoltaic modules will generate an estimated 12,000 kilowatts of electricity that will be used for electricity and to supply the domestic hot water for cooking and showers via a solar hot water tank.

"The idea with that is in summer you don't need as much hot water," Gordon said. The geo-thermal technology he will utilize involves digging five wells 400 feet in the ground where water remains a constant 55 degrees. "The water's almost preheated," Gordon said. "That water gets pumped up, goes into the heat pump which runs off electricity and heats, which is very efficient and that is used to heat the house from heat pumps to air handlers, which then distributes heat through duct work and radiant heat through hot water pipes."

An additional challenge to building the home, according to Town Planner Steve Kushner, is that it is being built near a Traprock Ridge, which is protected by Connecticut state law. Gordon, therefore, must follow certain guidelines including saving and planting trees, meaning he could not just clear the land and open the lot to sunlight for solar power. "Hewas able to address the regulation and prove he could find a location on the lot and clear an area sufficiently large enough to generate solar," Kushner said. "That kind of added a unique dimension to it." Gordon's house, which is at 45 Deercliff Road, has been entered in the Zero Energy Challenge.

The definition for a "typical" zero net energy home, according to the Connecticut Energy Efficiency Fund, which is holding the Zero Energy Challenge, is a home designed to exceed minimum code standards. "Zero net energy simply means that a home uses no more energy from the electrical grid over a given period than it produces on site," the definition reads. "It will often incorporate advanced design and construction techniques." While Gordon's energy usage will not net zero, he said, it will meet his goal of building a simple house with elements that reduce average energy usage. "For the size of the home I think we're on to something," he said. "If I was a smaller home we could definitely build a home that was zero energy."

He will also get the home green certified by the National Association of Green Home Builders. The association ranks homes; the highest ranking it offers is emerald, then gold, silver and bronze. "For this house we're projected to get a gold level, which is pretty hard to do, so that's a pretty big accomplishment," Gordon said. Bill Ferigno of Sunlight Construction is building a home at 35 West Hills in Avon, which is also in the Challenge. According to the Energy Efficiency Fund, the four-bedroom, 5,000-square-foot home with a third story foyer, is being built to prove that a sophisticated, energy-efficient building can also be an architecturally sophisticated, high-end home that is indistinguishable from other conventionally constructed homes in the same neighborhood. It will be heated and cooled with a geothermal vertical loop system.

The grand prize in the contest is \$15,000. Second and third place are \$10,000 and \$5,000, respectively.