



## Green powered

### State Route 646 home to big residential solar array

June 5, 2011

Weirton Daily Times

BLOOMINGDALE - Drivers along state Route 646 aren't imagining they've seen a futuristic element in front of a rustic log home atop a hill.

It's a massive solar array, capable of producing 20 kilowatts of electricity on the property of Pat and Barb Davis at 7400 state Route 646.

It contains 80 solar panels. It reduces the Davis carbon footprint by 409 tons of carbon dioxide over a 23-year period. During its projected lifetime, the array's carbon pollution reduction will be the equivalent of removing exhaust pollution from an average SUV driven 520,000 miles, or the planting of 16,352 trees.

Those conversion statistics come from Energy Independent Solutions, the McKees Rocks, Pa., based firm that built and installed the array.

The Davises drive a Honda hybrid and their log home was built with dead standing timber from Montana, further enhancing their environmental credibility. The home is dramatic and luxurious and spacious inside, thus combining "green" with desirable living conditions.

Barb Davis said her husband began researching wind power shortly after they moved from Wintersville to their 14-acre property on a hill along Route 646, a curvy two-lane state route running from Wintersville all the way to Tappan Lake. She said his research was first triggered by the constant breezes blowing across the hilltop

where their three-bedroom log home sits.

He then started researching solar companies and installations as he continued looking into alternative energy sources for the property.

Pat Davis spent about six months researching, and he and Barb visited several installations after talking to various companies before settling on EIS.

While the array silently glints in the sun just beyond the crest of the hill where the log home sits with its manicured landscaping and circular drive and pond and flagpole, Barb Davis said it works no matter the weather.

"It will make power with up to 9 inches of snow on it. It's all American made and it's very efficient," she said, explaining how the big control boxes mounted on the back of the array work.

The array's power is converted from direct current to alternating current and sent up an underground line to the house and other structures on the property.

Power also is sold back to the power grid, resulting in lowered electricity costs beyond the savings on energy consumption.

Barb Davis explained that Ohio only allows an installation for a residence to be as big as the previous year's consumption. She said the search for a renewable energy supply was pushed by AEP noting their property was using more than 95 percent of its nearest neighbors.

"We have no idea of why, but this house was just sucking up some energy," she said.

Joe Morinville, energy consultant and certified energy auditor for EIS, explained the big array is his company's first in Ohio, though it's got extensive experience with dozens of installations in Southwestern Pennsylvania.

He explained that any installation over 50 kilowatts is required to be

declared a commercial installation. While that can be advantageous in terms of how electricity is sold back to the power grid, most residential and agricultural customers don't go through the trouble of being declared a power producer.

Still, he noted, the Davis' array is not typical of most residential installations.

He said the Davis property with its outbuilding was using more power than the typical home, which would have energy consumption of about 12 kilowatts to 14 kilowatts a year.

"That would be about half the size," he said.

The advantages for a solar installation are environmental and economic, he noted, with incentives boosting the economic reasons for installations.

In Ohio, the solar renewable energy credit program allows power utilities to claim a credit on a solar array as a clean energy production plant at a rate of about 30 cents to 40 cents per kilowatts hour of the energy produced.

A solar installation is registered with PJM Interconnection, the management entity for the electrical grid across 13 states and the District of Columbia. Morinville said the Davis solar array, for example, has its monthly output reported to the grid and utilities can buy that production to offset their mandates to produce clean energy.

He said the value of those purchases are about three to four times the value of the energy.

"Thus, the Davises offset not only their electrical needs, but they have a 5-year projected return on investment," he said. Morinville noted the lifespan of the array is projected between 30 and 35 years, carries a 25-year warranty and was built from all American parts.

There's also a 30 percent federal tax credit. Morinville said state programs have stalled a bit. Ohio had a grant and rebate program, but it ran out of money.

He said still, with the federal credit and the ability to sell clean energy rights to the utilities, the return on investment can come quickly.

Barb Davis noted their array cost about \$96,000, and is anticipated to pay for itself in five or six years.

"EIS estimates we can save \$261,000 over the life of the system at current rates, or about 485 percent of the cost of the system," she said, showing off a computer monitoring system for the array done through a website. There's also a smartphone app, she said.

Barb Davis noted the installation crew handled all kinds of small details, including cleaning the metal framework after sinking supports into postholes.

The array, Morinville said, is rated at 20 kilowatts based on the production of all the plates in all 80 of its 240-watt modules.

He debunked the argument many people have about solar being ineffective in areas such as the Tri-State, where cloudy days can dominate many weeks.

"The sun is the same as it has been for 10,000 years and it will be the same for the next 10,000. You can produce tremendous power, and you still will in the rain or the snow, just not as much. It mitigates the effectiveness of the panel," he said.

He said if a 20 kw system was installed in the Arizona desert, it probably could produce as much as 30 kw, simply because it would have more sunlight.

"When we determine the estimate of what an installation will produce, we're not guessing. We use 10 years of normalized weather data for the GPS coordinates for your installation," he said. "We run that through the National Renewable Energy Labs calculator, which includes setting the panels orientation to the sun, then we overlay the weather data and determine the number of cloudy and show days to factor into rating the array."

Thus, an array's rating is based on actual weather data, not just

potential based in the equipment.

"Yes, we get cloudy days, but we factor that in. It would produce significantly more if there were no weather," he said.

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