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Dig that zero

Family's lake house produces more energy than it uses

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HARRIMAN — At first glance, nothing's obviously different about the Harriman lakeside home of David Bolt and his wife, Barbara Lamb.

There are three cars in the driveway, a small garden patch, two kids, two dogs, and a long lawn leading to a cove off Emory River. But on sunny days, if you keep an eye on the electric meter, you'll see something very unusual.

It runs backward.

The Bolt-Lamb household generates energy from the sun using photovoltaic cells on the roof. They sell this electricity back to TVA as part of its Green Power Switch Generation Partners program, which provides support and incentives for the installation of solar and wind-generating facilities and homes.

Because the Bolt-Lambs use less energy than they produce, they currently carry a $228 credit with the Harriman Utility Board. If they keep that up for a year, they'll even get a refund.

Bolt calls this a "net-zero energy" house. He began renovating the 30-year-old, 2,400-square-foot house nearly two years ago and has been living here alone since last June.

During that time, he has reduced the home's energy consumption to about 10 kilowatts per day, a fraction of the 1,000 kilowatts per day used by the average American home and less than his solar cells typically produce.

His goal is to keep energy consumption less than production for a whole year.

"I look at this as an experiment," says Bolt. "I'm doing my little part to reduce global warming and be a better steward of the Earth's resources."

But when the rest of the family moved in full time two weeks ago, the experiment got a little more complicated. Bolt's trying to get his wife and kids Matthew, 19, and Lisa, 11, to use as little energy as possible, too. They plan to sell their traditional West Knoxville 3,700-square-foot suburban home, but not without a few reservations.

"They think Dad's kind of nuts," Bolt says with a laugh.

"The hardest adjustment is that we don't get to use the air conditioner," says Lamb, noting the high humidity of the lake house.

"No, we choose not to use it," Bolt replies quietly, taking a sip of ice water.

The ice came out of a very efficient refrigerator, of course.

Bolt says he has spent about $100,000 fixing up this house. One third of that was on design changes such as new flooring and an extra bathroom. One third was on energy-savings measures such as a heat-reflective metal roof, fluorescent light bulbs and efficient appliances. Another third was spent on energy-collection methods like the solar-power cells and a solar hot water heater.

Has all this been cost-effective?

"Well, I don't look at it that way," Bolt says. "If I had not pursued this, my energy bills would increase in the future. I see this as pre-paying my energy bills for life."

Bolt sold a software development company in 2003 that he had founded. He now makes energy efficiency his livelihood, starting an online company called Sustainable Future —visit www.SustainableFuture.biz. — that offers energy-efficient products and support.

Bolt's family seems supportive of the new job and home. But, Lamb says she has her limits.

Because of the lack of air conditioning, the house is humid and has mold problems. Lamb isn't not interested in a clothesline, so she hauls laundry back to the Knoxville house for now until they buy a washer-dryer combination unit that saves water and energy.

"When he sees we're not zero energy, he's going to make us cut back," Lamb says. "I'm trying not to rough it as much as he is. I'd like to live a middle-class existence."

Maybe the compromise will be on a new house the family plans to build from the ground up someday, designed to be net-zero energy in an even more comfortable way. This may include an efficient air-conditioning system using solar power or geothermic cooling.

Until then, Bolt plans to continue pushing the family toward using fewer fossil fuels. The lawn, for example, may give way to woods or meadow they don't have to mow. And they'll eventually replace the older cars with more efficient models.

"This was a compromise," says Bolt of the lakeside zero-energy house. "If it were up to me, we'd be living on a sailboat."