WARMING UP TO SOLAR POWER

By Bill Sizemore
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A little more than a year ago I joined a small, scattered club of Hampton Roads homeowners, and I'm still wondering why there aren't more of us.

I had a solar hot-water system installed on my house.

Now the results are in: The system works – and I've got a year's worth of lower electric bills to prove it.

I'm tapping into the cleanest renewable energy source there is: the sun. It has zero emissions, uses no water and produces no waste. Best of all, it's free.

Of all the investments a homeowner can make in renewable energy, most experts agree that a solar hot-water system has the biggest impact at the lowest upfront cost.

So why aren't more people doing it?

I don't know. Inertia, maybe. Or other priorities. Or sticker shock. Even though the system eventually pays for itself in energy savings, it does require a substantial cash outlay at the time of installation.

But there are multiple reasons to do it.

It uses a simple, time-tested technology that's been around in its most basic form for 100 years. Once installed, it should last for decades and is virtually maintenance-free. It adds to the value of your home. And by reducing household energy use, it cuts pollution and reduces the nation's dependence on foreign oil. A typical residential solar hot-water system cuts greenhouse gas emissions – a major source of global warming – by 1 to 2 tons a year.

Plus, there's now a federal tax credit that lowers the upfront cost and shortens the payback period. It covers 30 percent of the system's cost, up to $2,000.

Hot water is a major energy user, accounting for 15 to 20 percent of a typical household's energy outlay. A solar system should reduce water-heating costs by 50 to 75 percent, making the drop in total energy use in the range of 7.5 to 15 percent.

Based on those numbers, my experience is typical. Over the first year my system was in operation, my electric bills dropped by 10 percent, saving me $160.

My system cost $5,145 to install. After taking the tax credit, the net cost was $3,601. At worst, that means the system will pay for itself in 22 years. Taking into account the increase in my home's value and the likelihood of rising electric rates, the actual payback period is likely to be shorter.

My system, sized for a household of two, is a relatively small one. Larger systems cost more upfront but pay for themselves sooner.

My system has one 4-by-8-foot collector panel mounted on the garage roof. A south-facing roof is best; any facing on a southerly arc from east to west is OK. For larger households, more panels can be added.

The panel consists of a black, chrome-plated copper sheet covered by glass. Bonded to the copper sheet are copper tubes carrying propylene glycol, an antifreeze.

The antifreeze is pumped in a closed loop between the collector panel and a heat exchanger – copper tubing wrapped around an 80-gallon solar water heater in the garage. Activated by a sensor on the roof, the pump kicks in whenever the temperature on the collector panel gets 15 degrees warmer than the water in the tank.

The system preheats the incoming household water supply before it enters the conventional water heater, which sits next to the solar heater.

My system was installed by Solar Services Inc. of Virginia Beach, the only qualified installer I could find in Hampton Roads. Its owner, Richard Good, told me he thinks the solar industry is getting ready to take off after a long dry spell.

The industry flowered briefly in the 1970s, thanks to federal tax incentives enacted during the Carter administration in response to skyrocketing oil prices. The tax breaks were eliminated by the Reagan administration in the mid-1980s, driving many installers out of business.

Good, an English-born marine engineer, was bitten by the solar bug when he took a solar engineering class while living in Canada in the late 1970s. He started his business in 1986, just as many other solar entrepreneurs were jumping ship. Times were tough: Good delivered pizzas on the side to help make ends meet.

Finally, he said, "It's getting to the point where it's becoming good PR to be green." He is so confident he is moving his business into a new, bigger, solar-powered building.

The American solar industry has a lot of catching up to do. According to the U.S. Department of Energy, about 1 million homes – fewer than 1 percent of the nation's residences – use the sun's energy to heat water. While solar power has stagnated here for two decades, it has flourished in Europe, Israel, Japan and China.

The key is government incentives, which are necessary to help build a market until the industry can get big enough that the economies of scale drive prices down.

The federal tax credit, enacted by Congress in 2005, is a step in that direction. In addition, 19 states have adopted their own incentives. Virginia is not one of them.

If I lived in North Carolina, my system would have qualified for a 35 percent state tax credit, up to a maximum of $1,400, in addition to the federal credit.

North Carolina also offers a tax credit up to $10,500 for the next step in solar energy: a photovoltaic system, in which rooftop solar cells convert sunlight to electricity.

Without such incentives, photovoltaic systems are still prohibitively expensive for most homeowners – as much as $25,000, with a payback period of 40 years or more. The federal tax credit applies to those systems but, because it's capped at $2,000, it isn't much help.

The Ernie Morgan Environment Action Center in Lafayette Park, home of the Norfolk Environmental Commission, had a small photovoltaic system installed in 2004 with a state grant. John Deuel, the executive director, said it supplies 40 percent of the building's electricity needs.

On sunny days, a photovoltaic system can potentially produce more electricity than a household can use. A little-known Virginia law enacted in 1999 requires electric utilities to provide "net metering" for such systems. The utility installs a meter that can gauge power flow in both directions. When a household system produces more power than is needed, the utility buys it and feeds it into the grid.

But because of the high cost, few Virginians have taken advantage of the law. As of September, there were 59 net-metered photovoltaic systems in use statewide.

Solar hot water, on the other hand, is much more within reach of a typical homeowner. And for many, it's not just about saving money on their electric bill. It's about being part of something bigger.

Michael DiGrazia, a spokesman for the Boulder, Colo.-based American Solar Energy Society, says surveys taken at solar energy shows indicate that the No. 1 motivation for installing systems is a desire to help reduce pollution and global warming.

It's prudent to calculate the payback period for a household solar system, DiGrazia said, but that's not the whole story.

"There's an immediate emotional payback when you turn on your hot water and know it's coming from the sun. It's hard to put a price tag on that."