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## Going Solar Goes Mainstream

Tax Credits, Technology Bring Down Financial, Aesthetic Barriers

By Scott Sowers

Special to The Washington Post  
Saturday, August 16, 2008; Page F01

Nancy Elam and Dave Levinson didn't intend to become human guinea pigs. They just needed a new roof.

But their [Friendship Heights](#) home now represents the hottest trend in solar technology, the integration of power-producing hardware into the roof so that a solar home looks just like every other house on the block.

The idea of using the sun to heat water and create electricity is becoming a reality even in perennially partly cloudy Washington. People around the region are tapping tax credits, grants and home equity to add solar thermal and photovoltaic systems to their rooftops.

Photovoltaic systems can provide a third to two-thirds of the energy needed to power the house. Solar thermal systems can provide an average home with hot water for 10 to 11 months of the year without having to use electricity or gas. There's also that bit about saving the planet.

The investment to install these systems is substantial, payback periods are long, and the economic advantage boils down to a hedge by homeowners against rising energy prices. But advanced designs, government funding and visual improvements are ushering in a new era of solar.

The aesthetics of solar can squelch conversions as some neighborhood design committees object to how arrays look. This was a nonissue at the Elam-Levinson house, which is in the final throes of a renovation project that incorporates photovoltaic-generated electricity and a solar thermal system -- all cleverly disguised.

The photovoltaic cells are incorporated into what look like slate shingles. The solar thermal system that heats domestic hot water runs underneath them. "The house looks nice, and we're doing something positive," said

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Nancy Elam and Dave Levinson have solar panels that resemble shingles. "We're doing something positive," Elam says. (By Leah L. Jones For The Washington Post)

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Elam, a retired federal lawyer.

The couple's path toward reducing their carbon footprint actually began with a leaky roof.

"It was 30 to 40 thousand dollars for a new slate roof," said Levinson, also a lawyer. The couple has owned the house since 1991 and had already begun a renovation project with Bob Reinhardt of Reinhardt Architects in Garrett Park.

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"Ten years ago we did a deck, and in 2006 they came to me about a slate roof that leaked, an old mechanical system and possibly putting a home office on the third floor. There was no discussion on green or sustainable design," Reinhardt said.

As the design team kicked around ideas, the couple applied for and received a Renewable Energy Demonstration Project grant from the District's Department of the Environment.

The renovation is still too recent for any long-term readings on how much power is being generated or saved, but the owners report that their April and May power bills were half of normal and June's was a third less.

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Over the course of a year, they expect to save 40 to 50 percent over what they used to spend on energy. The cutting-edge photovoltaic cells that look like slate shingles cost \$70,000; the solar thermal system hidden under them was another \$8,500. The grant paid for a third.

Capturing the sun's power doesn't have to cost that much -- especially if the panels don't have to be hidden.

"We have a wide range of economics in terms of our customer base" said Tony Clifford, president of Standard Solar in Gaithersburg. "Nobody is poor, but we have retired school teachers, engineers, architects, mid-level government workers. It's all over the map."

Clifford came into the solar business with a background in finance, which helps him guide his customers through the confusing array of government incentives and credits.

The federal government offers a tax credit of up to \$2,000 each for installation of a qualified solar power system or a qualified water heating system. States and counties also offer credits and grants that can be combined to greatly reduce the start-up costs. (The Database of State Incentives for Renewables and Efficiency, at <http://www.dsireusa.org>, tracks the ever-evolving list with an interactive map of the country.)

For instance, Clifford said, Montgomery, [Anne Arundel](#) and Howard counties offer \$5,000 property tax credits for installing solar systems. [Harford County](#) offers a credit of \$2,500. Maryland offers an additional \$10,000 in grants. Add these up, factor in the money from the feds, then take into account the savings on the electric bill and, in some places, solar starts to make economic sense.

Ajay Chitnis and Susan Koester are both scientists at the [National Institutes of Health](#). Since they bought their

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Dave Levinson and Nancy Elam have photovoltaic-generated electricity and a solar thermal system. (By Leah L. Jones For The Washington Post)

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Rockville house in 1997, they have been making it increasingly energy-efficient. "We redid the windows, changed out the HVAC system [heating, ventilation and air conditioning] and dramatically reduced our usage," Chitnis said. The couple cited [Al Gore's](#) film "An Inconvenient Truth" as an influence, as well as documentaries that depict regular people using solar power.

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"It wasn't just rich people doing it," Chitnis said.

In April, the couple decided to take things to the next level by tapping savings and installing a 2.3-kilowatt photovoltaic system on their rear-facing roof. It cost \$27,000, but they got \$8,000 back in tax credits and have cut their electric bills in half compared with their usage before going solar and switching out the heating and air-conditioning system.

On sunny days, with the air conditioner off, the photovoltaic panels generate

more electricity than the house uses. The system was installed with a digital electric meter that allows the owners to see when the house turns into a power generator. "The first day it was installed in April, we just had the lights on in the house and you could see it producing power," Koester said. "It was pretty amazing."

Any excess power generated by the house counts as a credit against the family's electric bill. With older electric meters, the wheel would actually spin backward, but new meters, like everything else, have gone digital.

Proponents of solar typically caution that the best way to take advantage of the sun is to ensure that the house is already highly energy-efficient. Adequate insulation, tight doors and windows, and updated heating and air-conditioning systems are keys to making solar work.

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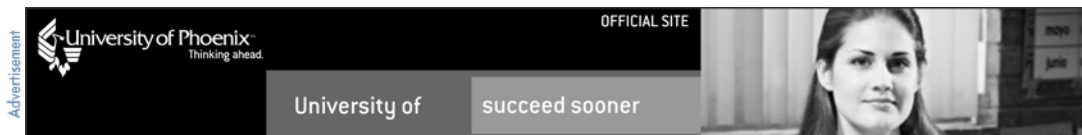
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If you're not sure what shape you're house is in, schedule an energy audit from a qualified contractor. "That is a good first step," said David Peabody, principal architect with Peabody Architects in Alexandria.

Peabody and other design professionals take audits one step further by performing "energy modeling" using a software-based system that allows designers to build a model of a house on a computer. Virtual changes can then be made to windows, doors and insulation to see the effect on energy demand before installing solar panels.

"I admire the people who are [installing solar], but we also need to look at reducing on the demand side," Peabody said.

William Wurtz and Lisa Swanson have been working on the demand and supply sides at their turn-of-the-century Italianate townhouse in the District, which they have owned since 1991. They recently had photovoltaic panels installed on the roof, but only after acing their energy audit. Swanson works for the Postal Service, and Wurtz is a carpenter.

In November 2006, the couple began an extensive renovation. They have been doing most of the work themselves but got some design help from Janet Bloomberg and Richard Loosle-Ortega of Kube Architecture in the District.

"About half of the clients we talk to now say something about wanting to build green, but it never used to be like that at all," Loosle-Ortega said.

"I've been waiting my whole life for a solar panel," Wurtz said. They also considered installing a solar thermal system on the roof -- a device that looks like an array of oversize radio tubes -- to provide hot water but instead opted for a tankless water heater. Their roof-mounted 2-kilowatt photovoltaic system cost \$21,000.

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The couple hoped to reduce the upfront cash outlay when they applied for a D.C. Renewable Energy Demonstration Project grant. "We were led to believe that everything looked good on the application, but then we were told they ran out of money," Swanson said. The grant would have paid for half the cost of the system.

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According to Karen Davis, an energy program specialist for the District's Department of the Environment, the most recent round of the grant program ended this week. A new round will soon be announced for fiscal year 2009, and applications can be downloaded from the Department of the Environment's Web site.

Swanson and Wurtz didn't get their grant, so they are taking advantage of the federal tax credit and paying for the rest of the project out of their renovation funds. Illustrating the still-experimental nature of mainstream

solar, the couple's first electric bill with the new system was for \$1,214. Because their typical bills previously were \$100 or less, the couple called Pepco. After several calls and some recalculating, Pepco reduced the bill to \$40.

Although some kinks remain in the billing process, the couple said solar in the District is a no-brainer. "The viability of PV [photovoltaics] is not a big leap, and on a flat roof it's not a risky proposition," Swanson said.

While the role of solar in the energy mix is increasing, the folks selling the systems are more impressed with changes among users. Greater awareness of how much energy is being consumed or generated can be life-altering.

"You can get the energy readings for how much power your system is generating sent right to your [BlackBerry](#)," Clifford said. "It absolutely changes behavior."

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