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RICHARD SCHULTZ FOR TIME

STEVEN STRONG
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Why Create Energy When You Can Save It?

BY CHRISTOPHER HALLOWELL

The solar panels on top of Bill and Deborah Lord's house in Kennebunkport, Maine, are not clunky '70s-style add-ons. They make up the entire roof, creating a crisp and shiny plane ready to catch the sun. On a January day with clouds scudding overhead, Steven Strong looks up at the south-facing surface, his eyes as bright as the collectors as he surveys his design. On sunnier days water flows through tubes built into glass-covered panels that make up half the roof, getting hotter as it travels along. Eventually it drains to storage tanks in the basement to be maintained, with the help of propane heaters during winter nights, at 150* F. Some goes to meet domestic hot water needs, some to heat the house. When the thermostat in the living quarters calls for more heat, the water is pumped from the tanks through a maze of plastic pipes coiled in a thin cement layer under the 2,700 sq. ft. house's floors before returning to the basement, then back to the roof in a never-ending circle.

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A non-profit organization dedicated to research and implementation of ecological design and construction

On the other half of the roof is a different kind of solar collector. There dark blue photovoltaic cells or PVs--panels made of silicon implanted with tiny black threads--come alive, even during an overcast winter day. Sufficently agitated, electrons in the highly conductive silicon begin swarming along the threads to metallic bands running into a cable that enters an electric panel box in the basement to serve the home's needs. "What is so elegant about this system," says Strong, "is that the electrons go and do their work and then come right back to the PV. No loss of resources."

Inside, the house is toasty at 72 degrees Farenheit from floor to ceiling, curtesy of a venting system that circulates air. The floors are warm to the touch. The windows are, too. Two invisible plastic films containing argonne, an inert gas, between them are incorporated inside the thermal panes of each window. In winter, the gas prevents heat from leaving through the glass; in summer it stops the sun from penetrating inside.

Strong loves to show off the house as does Bill Lord, a retired ABC News producer. The basement is Lord's favorite place. The two silver-wrapped 500-gal. insulated water tanks tower above him. Beside him, frenzied electrons run down cables to an electrical meter. Interesting is the digital number on the meter, especially on this cloudy day. It registers -9.00, meaning that the roof's photovoltaic panels, in addition to meeting the house's typical needs such as lights and appliances, are producing 9 extra amps (about as much as a 7-in circular saw draws), which can be sold to Central Maine Power Company, the local utility. During nights or really dark days, the Lords buy back electricity from the company. But in an average year, the Lords come out ahead, accumulating about a half-megawatt of energy that they can sell back to the utility.

Strong has based his professional life on two design principles that he repeats like mantras--"solar energy" and "energy efficiency." Fresh out of engineering school in the early 1970s, he found work on the Trans-Alaska pipeline measuring

the energy-saving capacity of the housing that protects the pipe's giant valves. One of his jobs was to scour every surface for heat leaks, and he found plenty in surprising places: every nail and screw provided a tiny escape route to the frigid air outside that could plunge to -75 degrees Farenheit.

"My fundamental awakening was that it is easier to save a unit of energy than to produce one," he says. To understand that, all he had to do look out the outlandish construction efforts that went into laying the pipeline. "I kept wondering why are we investing these billions of dollars for only a few decades worth of oil."

A few years later Strong had another ephiphany. This time he was assessing the reliability of solar-powered relay stations on a telecommunications cable that crossed a desert in Cameroon. The stations used photovoltaics, then a new technology used mainly by NASA on its satellites. "I was blown away," says Strong. "Nothing was wasted. The energy was entirely renewable. It was just--whew!"

Now 48 and the president of his own architectural and engineering firm, Solar Design Associates, in Harvard, Mass., Strong has designed and consulted on scores of what he calls "environmentally responsive buildings." Latest on the list is a 12-story-high cube for the Discovery Science Center in Los Angeles. His clients include Disney, Lucent Technologies and a handful of utilities that appreciate the value of being able to buy electricity from customers during summers when demand for energy is high.

But Strong's "passion" is designing homes for individuals and families who can afford his expertise. For actor Robin Williams he built a hilltop array of solar collectors that looks a field of giant sunflowers. Clients like Williams who are willing to pay a premium enable him to try out innovative designs. "Comfort rules" is his credo, which he contrasts with solar-energy and energy-conservation philosophy following the 1974 Arab oil embargo.

Then, thick solar panels of questionable efficacy angled up from rural dwellings as a source for hot water. Thermostats turned down low tended to keep homes uncomfortably cool. "It's so nice walk up on a winter morning in a bedroom that's 76 degrees," Strong says.

While designing residences may please the client, it does not necessarily convince many others of the benefits of solar. To counteract what he calls "blissful ignorance" of solar energy among architects and policymakers, Strong criss-crosses the country to drum up acceptance. He delivers two messages: the first is that a lifestyle based on fossil fuels puts this country in a "morally indefensible position;" the second is that solar energy "is here, it works, it's reliable, and it's comfortable." What more can be asked of a free energy source?