



Living on the Earth

Good house, bad house:

Retrofit options for sustainability

story, solar designs & photos
by Paul Shippee

"Sustainability means living without driving," Alice quipped during a recent Baca conversation. We were standing on white snow under a blue Colorado sky. I happened to look up and notice a heart-shaped gray cloud moving in to block the sun when Alice corrected herself. "Come to think of it," she said, "there's nothing wrong with driving. It's what you put in the gas tank that's the problem—those ancient sunlight fuels we're depleting."

Alice's thoughtful statement put me in a philosophical mood; how do you translate that problem into action? My thinking moved naturally toward houses, the ones that are already built. If you own a house, then it seems easiest to start there. You can cut your heating bills in half with a caulking gun and some free bubble wrap, right?

Stand-alone houses lose a lot of heat in winter mostly through window glass, ceilings and cracks everywhere. The first dollars you spend (invest) to save home heat should be spent on these areas. On a cloudy morning last week I saw a house with sleeping bags hanging in large south-facing windows. Do-it-yourself tasks like caulking cracks, insulating windows at night, adding attic insulation and perhaps storm windows are a way to double your investment with sweat equity and recoup a rapid payback as fuel prices rise. State weatherization programs usually attack these items first for these same reasons. It's all low hanging fruit.

A friend told me he stapled bubble wrap to a roller shade and saw a quarter inch of ice on the glass in the morning after a very cold night. Another bubble wrap fan saw green plants grow in a funky solar greenhouse in midwinter where they never did before. Results! Window treatments can range in cost from a few cents per square foot for bubble wrap and roller shades up to an expensive \$15 per square foot for attractive triple cell pleated accordion designer shades that are also translucent. As a compromise, I am considering using silk draperies at \$10 per yard (that's about \$1 per square foot for materials).

Thermostat reduction and wool sweaters bring further savings for free. Older folks may need warmer rooms. My dad cut his heating bill more than in half in a smallish conventional New England home by replacing old double-hung leaky single glass wood windows with new tight vinyl double glass windows. Keeping the old storm windows in place resulted in economical triple glazing. Adding an extra foot of insulation in the attic (not possible with cathedral ceilings) and keeping the old oil burner clean and running efficiently rounded out the program for both big savings and a warm house. Fortunately, for the sustainability picture there is a lot of slack available for reducing energy consumption in the old built environment in America.

On a larger scale, as a solar designer and contractor working in



Some century-old brick homes call for installing a glass wall on the south side and wrapping the other three sides with insulation and new siding.

Boulder, I helped convert several older homes for energy conservation. Some century-old solid brick homes with limited south yard space called for installing a glass wall over a one or two-story south brick wall, and wrapping the other three sides with insulation and new siding. A Trombe wall passive solar heating system with plenty of interior thermal mass was achieved along with a tighter building envelope.

Some of the newer wood frame houses seemed to call for a sun space (solar greenhouse) added on to the south side when there was yard room. A fan was often em-

ployed to carry excess warm air to the north rooms and perhaps a passive domestic water tank painted black was placed in the sun behind the glass. These attractive improvements formerly qualified for hefty energy tax credits and may soon do so again. Stay tuned.

Domestic water heating and space heating by active solar systems (think solar collectors) might also come into the economic picture, especially if attractive tax credits become available on both the federal and state levels. In Boulder we designed and installed both air

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Insulating windows with blinds, shades or drapes is one of the most effective ways of saving energy. Here, styrofoam beads blown between two layers of glass 4" apart can greatly enhance the performance of a passive solar system on winter nights. This SunEarth house is 100% solar heated. The beads are sucked out of the windows in the morning by vacuum cleaner motors and stored in large metal bins in the garage.



A newer wood frame house called for a food- and heat-producing solar greenhouse retrofitted to the south side.



