

# Let the Sun Help Heat Your House

**Q:** *The sun shines directly in a living room window and it is very warm. I want to make or install something to capture that heat and lower my heating bills. What do you suggest?*

**A:** All of the heat energy we use in our homes comes directly or indirectly (gas, oil, coal, wood, etc.) from the sun. Some of it—such as oil, gas or coal—has stored the sun's energy for millions of years. Trees store it for decades until we burn them. Residential solar systems use the sun's heat as it shines on houses each day.



**This is a solar wall built in a bedroom near a large sliding glass door. The bricks provide thermal mass to store the heat during the day and release it into the room at night.**

Photo by James Dulley

You must be realistic in your expectations for using free solar energy to heat your home. Although it can be accomplished, trying to provide 100 percent of the heating needs of an existing house with solar is difficult to do, while maintaining acceptable comfort. An initial target of a 10-percent savings is reasonable for a do-it-yourself solar project.

If you are new to solar energy and plan to build a heating system yourself, stick with one or more simple passive systems.

Just having the sun shine in a large window is effective passive solar heating, but it can be made more efficient. This type of solar heating is especially efficient in warm southern climates, where the winter days do not become as short as in northern areas. Also, because it is warmer outdoors in mild climates, less heat is lost through the window at night.

To be most effective in every climate, there should be adequate thermal mass in the room with the window. This thermal mass captures the sun's heat so the room does not overheat or lose as much of the heat back outdoors. Once the thermal mass warms up, it slowly dissipates

the stored heat back out into the room once the sun no longer shines in.

If you are not interested in Flintstone-esque decor with a pile of rocks in the center of each room, there are other methods to increase thermal mass in a room.

It is preferable to have the thermal mass in the direct path of the sun's rays, but this is not critical to be effective.

You can make planters with concrete blocks or bricks. You can pour and make your own concrete planters using tinted concrete similar to contemporary concrete kitchen countertops. A large terrarium with damp soil has a reasonably high thermal mass, and it adds humidity to the air.

The best solar option, if you do not need a view outdoors from the entire window, is to build a solar Trombe wall. A simple design uses stacked bricks or concrete blocks very close to the window. The vertical stack is warmed by the sun, which creates an upward warm air current. This circulates the warm air throughout the room, while it stores heat for the nighttime. In summer, just remove the bricks or blocks and store them.

If you want to keep the view from your window, make a shallow, flat solar heater that rests against the outside wall facing the noon-to-afternoon sun. A size of four feet by eight feet is good because it makes the most efficient use of inexpensive standard lumber. The box has to be only the depth of standard 2x4 studs.

Once the plywood box is completed, attach foil-backed rigid foam insulation on the inside of the box, with the foil facing inside. Paint the foil surface flat black. Cut one hole in the back at the top and one at the bottom and install duct stubs. Cut holes in your house wall so the duct stubs come through to indoors. Cover the front of the box with a sheet of clear acrylic plastic and seal it.

The solar-heated air will flow up and out into your room. Make airtight indoor covers to seal off the duct stubs at night, otherwise the air flow will reverse and actually cool your house. ■



To ask a question, write to **James Dulley**, Energy Report, 6906 Royalgreen Dr., Cincinnati, Ohio 45244, or check his Web page, [www.dulley.com](http://www.dulley.com).

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