



## **ECOBROKER International** **Green Topic Pages**

### **Heating - Passive Solar**

#### ***Technology Snapshot & Benefits:***

Easy economic savings accrue from designing and building features that effectively trap heat from the sun during the day and release that heat slowly throughout the nighttime. The effect is similar to living near a large body of water where the thermal mass of the water lessens temperature extremes. That means reduced heating and cooling load for a building, and that saves you money.

You may easily incorporate thermal mass into a building for passive solar heating by using materials such as concrete, stone floor slabs, or masonry partitions that hold, then slowly release heat. Orienting your building so that the longest walls run from east to west, and using large south-facing windows, allows the sun to help heat the home in winter. Properly designed roof overhangs shield the building interior from the summer sun. Passive solar designs use natural methods to stabilize the internal temperature of a building without the need for active mechanical devices such as pumps or fans, although these may be used to supplement performance. Passive solar designs also include natural ventilation for cooling. An obvious method is simply locating windows in the building strategically so that when opened, a natural breeze may be easily accelerated in the interior. Openings and passages designed into ceilings will promote the escape of hot air from the interior of the building through the roof or upper windows.

#### ***Estimated Cost Savings:***

Passive solar designs can reduce heating bills as much as 50 percent. For a monthly heating bill of \$200 dollars, you may expect savings of \$80-\$120 per month. If passive solar features are included at the time of initial construction, or as part of an overall remodeling effort, the effective net cost of improvements will be much lower. However, you will benefit immediately in your monthly cash-flow.

#### ***Issues:***

Passive solar designs are easiest to implement at the planning and design stages of a new home. However, existing buildings may be quite easy to retrofit with passive solar improvements. Virtually all occupants of passive-solar homes report enjoying design features, improved efficiency, and an enhanced sense of connectedness to the natural world.

#### ***Regional Issues:***

There is no cookie-cutter or one-size-fits-all solution to passive solar design, as good solutions will be tailored to specific latitudes. A design that works well in Minnesota is not a design that would work well in Florida. Roof overhangs, for example, are designed specifically for your latitude mindful of prevailing wind direction and other climatic features specific to location.

#### ***Installation (Getting It Done):***

Take advantage of many fine helpful books and resources. Particularly, see:

[Sustainable Building Sourcebook](http://www.greenbuilder.com/sourcebook/) (<http://www.greenbuilder.com/sourcebook/>)

[U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy: Passive Solar Heating, Cooling and Daylighting](http://www.eere.energy.gov/RE/solar_passive.html) ([http://www.eere.energy.gov/RE/solar\\_passive.html](http://www.eere.energy.gov/RE/solar_passive.html))

Be sure to get two or three (or more) bids from designers and/or building contractors to gain immediate perspective on the true costs of passive solar and installation details in your area.