

# Beat the Heat with Passive Cooling

“The best strategy for keeping a dwelling cool is to keep it from getting hot in the first place.”

- Real Goods Solar Living Sourcebook

Abandon conventional air conditioning ... We don't use conventional air conditioning and we encourage everybody else to abandon it too. There is an art to living without air conditioning that has largely been lost. People used to know how (and when) to open their houses at night for ventilation, and when to close them up in the day time to keep out the heat of the days. - Robert Waldrop, Oklahoma City

<http://www.bettertimesinfo.org/retrofit.htm>

Apply these weatherization , insulation, shading and alternative cooling tips ... and your need for energy-intensive mechanical cooling will be eliminated in all but the most severe climates.

## THE LOW-HANGING FRUIT:

Decrease use of heating appliances ... oven, stove, toaster oven, hairdryer, clothes dryer. Replace heat-producing incandescent lighting with compact fluorescent lighting. Turn off pilot in furnace (not a cooling technique, but a waste-prevention technique).

Close curtains and windows during the day for any south-and west-facing window that lets in direct sunlight.

Nighttime cooling ... Open windows and doors to admit cool night air. Close them again as the sun rises. A well-insulated building will retain “cool” for many hours.

Interior window coverings ... Miniblinds can reduce solar heat gain by 40 to 50% - Real Goods Solar Living Sourcebook

Exterior window shades or awnings ... Once the sun hits the window, the heat gets in the house by conduction, even if there is a shade and a curtain on the inside of the window. Robert Waldrop, Oklahoma City

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Hang tightly-woven screens or bamboo shades outside the window during the summer to stop 60-80% of the sun's heat from getting to the window. - Real Goods Solar Living Sourcebook

Weatherization ... Weatherization is the plugging and sealing of air leaks. Usually emphasized for northern climates in wintertime to keep heat in, it can also effectively keep heat and humidity out.

Weatherstripping doors, windows and attic openings; sealing around plumbing vents; insulating around electrical wire penetrations; sealing holes between the living space and the attic/crawlspace. - Real Goods Solar Living Sourcebook

Personal cooling solutions ... Proper clothing, hats, cool drinks, proper hydration, hand fans, and the wisdom of the siesta time are common sense solutions we often overlook.

Ceiling and table fans can move the air around inside (thereby knocking about 10 degrees Fahrenheit off the apparent temperature). - Robert Waldrop, Oklahoma City

## BIGGER SOLUTIONS:

Improve Energy Efficiency ... Energy conservation measures should come first. It doesn't make sense to retrofit a home that is not energy-efficient. - North Carolina Solar Center

Insulation ... slows heat transfer from outside to inside your home, and vice versa in the winter. Attic insulation levels should be R-19 or higher. - Real Goods Solar Living Sourcebook

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[www.LegacyLA.net](http://www.LegacyLA.net)

“What Can I Do?” ♦ Positive Environmental News ♦ Blog, Books, Links and Resources

Replace windows ... New high-tech windows can have R-value of 8 or 9 - Real Goods Solar Living Sourcebook

Landscaping for shade and passive cooling ... Plant deciduous trees and other vegetation and place structures (trellises, vines, large shrubs, etc.) appropriately so that your sunny exposures are shaded in the summer, but open to sunlight in the winter. People with flat roofs should definitely consider a green roof. Everybody should want a shady roof. - Robert Waldrop, Oklahoma City

Deciduous trees planted to the south or west of your building block summer sun, but drop their leaves to allow half or more of the winter sun's energy into your home to warm you on clear winter days. The valuable summertime shading will reduce unwanted heating as much as 50%. Those are better results than we get from more expensive projects like window and insulation upgrades! - Real Goods Solar Living Sourcebook

Radiant Barriers ... Thin metal films, typically stapled to the underside of attic rafters, will reflect approx. 97% of long-wave infrared heat radiation. - Real Goods Solar Living Sourcebook

Install awnings on south-facing windows where there's insufficient roof overhang to provide shade.

Roof whitening ... If you're replacing a roof, choose white or reflective surface. Coating existing roofs with white elastomeric paint specifically designed for roof whitening will reduce your heat load on the house. - Real Goods Solar Living Sourcebook

Remodeling and new construction ... Integrate the principles of passive cooling into the basic design of the structure. If you're planning a remodel or other construction, read the Kachadorian, Chiras, and North Carolina resources below.

Adjust your Expectations ... Understand that our future will be quite different from the trajectory of our historic and economic past. It must be. To reduce greenhouse gas emissions 70-80% over the next few decades, and to create a graceful solution to Peak Oil (<http://www.energybulletin.net/primer.php>), we must reThink and reDesign all of our fossil-fuel intensive habits. We will need to use our remaining oil to transition to a global Permaculture (Permaculture=Permanent + Culture). From our food supply to our transportation preferences, everything will change. Welcome the transformation!

#### RESOURCES:

The Real Goods Solar Living Sourcebook has chapters on passive cooling, windows, insulation, weatherization, cooling products.

"A Permaculture Retrofit for an Older Dwelling," by Robert Waldrop, gives 25 wise tips ranging from passive heating/cooling to energy and water savings. <http://www.bettertimesinfo.org/retrofit.htm>

"Passive Solar Retrofit for North Carolina Homes," a free pdf by the North Carolina Solar Center, is a good document to review if you're considering remodeling for other reasons. It discusses structural changes to the building. [http://www.ncsc.ncsu.edu/information\\_resources/publications.cfm](http://www.ncsc.ncsu.edu/information_resources/publications.cfm)

The passive solar house : using solar design to heat and cool your home, by James Kachadorian. (available at LA Public Library)

The solar house : passive heating and cooling, by Daniel D. Chiras. (available at LA Public Library)

"The Low-carbon Lifestyle," an online index of practical resources, plus philosophical guidance for the transformation of society to a more sustainable existence. [www.LegacyLA.net/LowCarbonLifestyle.htm](http://www.LegacyLA.net/LowCarbonLifestyle.htm)

Resource list compiled by Joanne Poyourow. Updated 8/07