

FULL OF HOT AIR?

Natural Cooling Technologies

By Howard Geller



Evaporative or “swamp” coolers can be an efficient alternative when done properly.

An evaporative cooler combines a natural process,

water evaporation, with a basic air-moving system. Fresh outside air is pulled through moist pads where it is cooled by evaporation and circulated through your home by a large blower. Also known as swamp coolers, evaporative cooling can work wonderfully well in dry and desert-like climates.

Modern evaporative cooling systems can keep a home comfortable with limited maintenance. If installed properly these systems will use less electricity, sometimes as much as 75 to 90 percent less, than a central air conditioner. Some of these systems can be installed at ground level or in the attic rather than on the roof. Fixed or portable evaporative coolers can be used in especially hot rooms such as those with west-facing windows. Two stage evaporative coolers have been

developed that pre-cool air before it goes through the moistened pad. They use an air-to-air heat exchanger to cool indoor air without raising its humidity. The new coolers are reported to be as effective as air conditioning, but their installed cost is comparable at \$2,500 - \$3,500 for a whole house system. The price may come down as more such systems are sold, but for now two-stage systems are hard to find. There are evaporative coolers on the market that use photovoltaic panels to create the electricity used to run the blower and the water pump. For hot, desert areas, the combination of evaporative cooling and solar power are a perfect match: the afternoon, when the most solar energy is available, is also the hottest part of the day, when cooling is most needed. And since swamp coolers use a fraction of the energy of air conditioners, PV cells can provide enough electricity to run the system effectively.

Water can be a concern with evaporative coolers. The newer, efficient models consume less water than older systems. Consumers should look for an evaporative cooler with an effectiveness rating of at least 85 percent, which measures how well the unit evaporates water. Also, unevaporated water should be recirculated and “dumped” periodically rather than continuously discharged. While evaporative coolers do consume water, they actually save water at the utility plant, because they save on electricity. Coal-fired power plants typically consume about two-thirds of a gallon of water for every kWh they generate. Xcel Energy offers rebates to homeowners that purchase an evaporative cooler.

It is important to know that not all evaporative cooling systems are created equal. Lower cost systems may lack key efficiency features, such as thermostat control and insulated ductwork, have higher maintenance requirements, and may not re-circulate water.

For more information read the SWEEP report *New Evaporative Cooling Systems: An Emerging Solution for Homes in Hot Dry Climates with Modest Cooling Loads*, www.swenergy.org. Also visit the California Energy Commission online, www.consumerenergycenter.org.

Whole House Fans

In a moderate climate like ours, it is possible to eliminate the need for an air conditioner entirely, without sacrificing comfort. This can be accomplished by reducing heat gains and installing ceiling fans or a whole house fan to take advantage of the cool night air in our arid climate. Whole-house fans are mounted in the hallway ceiling on the upper floor, sucking air from the house and blowing it into the attic. The fan should have at least two speeds as well as an insulated lid for use in the winter. When buying ceiling fans, purchase efficient models with the ENERGY STAR label.

Moving air is less expensive than cooling it. Taking these steps into account, with more complete recommendations for making your entire home efficient, can keep the stifling heat and energy costs in check.

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