ALTERNATIVE HOME

COOLING METHODS

PLATTE RIVER
POWER AUTHORITY

Alternative Home Cooling Methods

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Cooling Your Home

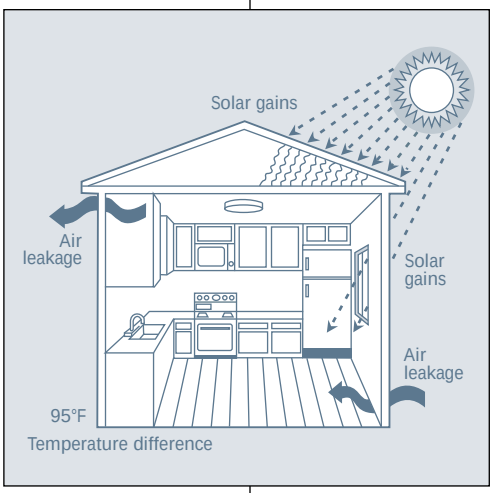
Keeping cool indoors when it is hot outdoors can be a challenge. The sun beating down on your home causes indoor temperatures to rise to uncomfortable levels. Air conditioning provides some relief. But the initial cost of installing an air conditioner and the electricity costs to run it can be high.

But there are alternatives to air conditioning. This publication provides some common sense suggestions and low-cost retrofit options to help you "keep your cool"—and save electricity.

Staying Cool

An alternative way to maintain a cool house or reduce air-conditioning use is natural (or passive) cooling. Passive cooling uses nonmechanical methods to maintain a comfortable indoor temperature.

The most effective method to cool your home is to keep the heat from building up in the first place. The primary source of heat buildup (i.e., gain) is sunlight absorbed by your house through the roof, walls, and windows. Secondary sources are heat generating appliances in the home and air leakage.



Specific methods to prevent heat gain include reflecting heat (i.e., sunlight) away from your house, blocking the heat, removing built-up heat, and reducing or eliminating heat generating sources in your home.

Reflecting Heat Away

Walls

Dark-colored home exteriors absorb 70% to 90% of the radiant energy from the sun that strikes the home's surfaces. Some of this absorbed energy is then transferred into your home by way of conduction, resulting in heat gain. White exterior walls absorb much less heat than dark walls. And light, bright walls increase the longevity of siding, particularly on the east, west, and south sides of the house.

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Windows

Roughly 40% of the unwanted heat that builds up in your home comes in through windows. Reflective window coatings are one way to reflect heat away from your home. These coatings are plastic sheets treated with dyes or thin layers of metal. Besides keeping your house cooler, these reflective coatings cut glare and reduce fading of furniture, draperies, and carpeting. Two main types of coatings include suncontrol films and combination films. Suncontrol films are best for warmer climates because they can reflect as much as 80% of the incoming sunlight. Many of these films are tinted, however, and tend to reduce light transmission as much as they reduce heat, thereby darkening the room. Combination films allow some light into a room but they also let some heat in and prevent interior heat from escaping. These films are best for climates like ours that have both hot and cold seasons. Investigate the different film options carefully to select the film that best meets your needs. *Note:* Do not place reflective coatings on south-facing windows if you want to take advantage of heat gain during the winter.

The coatings are applied to the interior surface of the window. Although you can apply the films yourself it is a good idea to have a professional install the coatings, particularly if you have several large windows. This will ensure a more durable installation and a more aesthetically pleasing look.

Blocking the Heat

Two excellent methods to block heat are insulation and shading. Insulation separates warm and cool areas and shading devices block the sun's rays and absorb or reflect the solar heat.

Insulation

Weatherization measures—such as insulating, weather-stripping, and caulking— help seal and protect your house against the summer heat in addition to keeping out the winter cold. The attic is a good place to start insulating because it is a major source of heat gain. Adequately insulating the attic protects the upper floors of a house. Recommended attic insulation levels depend on where you live and the type of heating system you use. In northern Colorado, you generally want a minimum of R-38. Wall insulation is not as important for cooling as attic insulation because outdoor temperatures are not as hot as attic temperatures. Also, floor insulation has little or no effect on cooling.

Although unintentional infiltration of outside air is not a major contributor to inside temperature, it is still a good idea to keep it out. Outside air can infiltrate your home around poorly sealed doors, windows, electrical outlets, and through openings in foundations and exterior walls. Thorough caulking and weatherstripping will control most of these air leaks.

Shading

Shading your home can reduce indoor temperatures by as much as 20°F (11°C). Effective shading can be provided by trees and other vegetation and exterior or interior shades.

Landscaping

Landscaping is a natural and beautiful way to shade your home and block the sun. A well-placed tree, bush, or vine can deliver effective shade and add to the aesthetic value of your property. When designing your landscaping, use plants native to our area that survive with minimal care.

Trees that lose their leaves in the fall (i.e., deciduous) help cut cooling energy costs the most. When selectively placed around a house, they provide excellent protection from the summer sun and permit winter sunlight to reach and warm your house. The height, growth rate, branch spread, and shape are all factors to consider in choosing a tree. Vines are a quick way to provide shading and cooling. Grown on trellises, vines can shade windows or the whole side of a house. Ask your local nursery which vine is best suited to our climate and your needs. Besides providing shade, trees and vines create a cool microclimate that dramatically reduces the temperature (by as much as 9° F [5°C]) in the surrounding area. During photosynthesis, large

Planning Your Planting

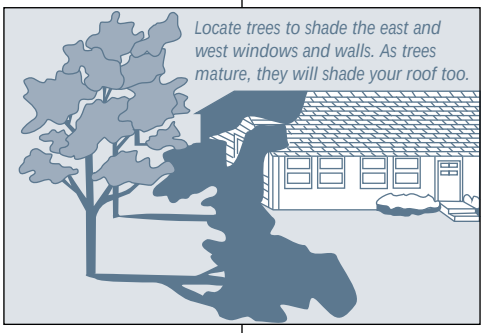
Placement of vegetation is important when landscaping your home. The following are suggestions to help you gain the most from vegetation.

- Plant trees on the northeast-southeast and the northwest-southwest sides of your house. Do not plant trees directly to the south. Even the bare branches of mature deciduous trees can significantly reduce the amount of sun reaching your house in the winter.
- Plant trees and shrubs so they can direct breezes. Do not place a dense line of evergreen trees where they will block the flow of cool air around or through them.
- Set trellises away from your house to allow air to circulate and keep the vines from attaching to your house's façade and damaging its exterior. Placing vegetation too close to your house can trap heat and make the air around your house even warmer.
- Do not plant trees or large bushes where their roots can damage septic tanks, sewer lines, underground wires, or your house's foundation.
- Make sure the plants you choose can withstand our local weather extremes.

amounts of water vapor escape through the leaves, cooling the passing air. And the generally dark and coarse leaves absorb solar radiation.

You might also consider low ground cover such as grass, small plants, and bushes. A grass covered lawn is usually 10° F (6°C) cooler than bare ground in the summer. Please consider native ground covers that require little water.

Landscaping is a natural and beautiful way to shade your home and block the sun's heat.



Shading Devices

Both exterior and interior shades control heat gain. Exterior shades are generally more effective than interior shades because they block sunlight before it enters windows. When deciding which devices to use and where to use them, consider whether you are willing to open and close them daily or just put them up for the hottest season. You also want to know how they will affect ventilation.

Exterior shading devices include awnings, louvers, shutters, rolling shutters and shades, and solar screens. Awnings are very effective because they block direct sunlight. They are usually made of fabric or metal and are attached above the window and extend down and out. A proper-ly installed awning can reduce heat gain up to 65% on southern windows and 77% on eastern windows. A light-colored awning does double duty by also reflecting sunlight.

Maintaining a gap between the top of the awning and the side of your house helps vent accumulated heat from under a solid-surface awning. In our area it's advantageous to remove awnings for winter storage, or buy retractable ones, to take advantage of winter heat gain.

The amount of drop (how far down the awning comes) depends on which side of your house the window is on. An east or west window needs a drop of 65% to 75% of the window height. A south-facing window only needs a drop of 45% to 60% for the same amount of shade. A pleasing angle to the eye for mounting an awning is 45°. Make sure the awning does not project into the path of foot traffic unless it is at least 6 feet 8 inches (2 meters) from the ground.

One disadvantage of awnings is that they can block views, particularly on the east and west sides. However, slatted awnings do allow limited viewing through the top parts of windows.

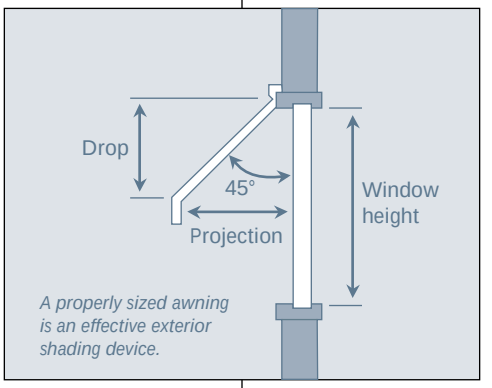
Louvers are attractive because their adjustable slats control the level of sunlight entering your home and, depending on the design, can be adjusted from inside or outside your house. The slats can be vertical or horizontal. Louvers remain fixed and are attached to the exteriors of window frames.

Roughly 40% of the unwanted heat that builds up in your home comes in through windows.

Shutters are movable wooden or metal coverings that, when closed, keep sunlight out. Shutters are either solid or slatted with fixed or adjustable slats. Besides reducing heat gain, they can provide privacy and security. Some shutters help insulate windows when it is cold outside.

Rolling shutters have a series of horizontal slats that run down along a track. Rolling shades use a fabric. These are the most expensive shading options, but they work well and can provide security. Many exterior rolling shutters or shades can be conveniently controlled from the inside. One disadvantage is that when fully extended, they block all light.

Solar screens resemble standard window screens except they keep direct sunlight from entering the window, cut glare, and block light without blocking the view or eliminating air flow. They also provide privacy by restricting the view of the interior from outside your house. Solar screens come in a variety of colors and screening materials to compliment any home. Although do-it-yourself kits are available, these screens will not last as long as professionally built screens.

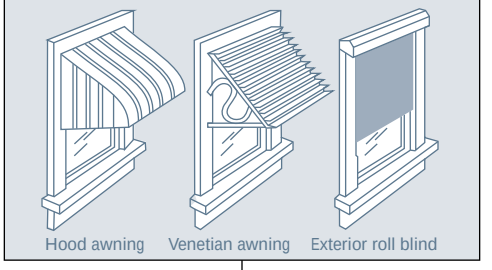


A properly sized awning is an effective exterior shading device.

Although interior shading is not as effective as exterior shading, it is worthwhile if none of the previously mentioned techniques are possible. There are several ways to block the sun's heat from inside your house.

Draperies and curtains made of tightly woven, light-colored, opaque fabrics reflect more of the sun's rays than they let through. The tighter the curtain is against the wall around the window, the better it will prevent heat gain. Two layers of draperies improve the effectiveness of the draperies' insulation when it is either hot or cold outside. Venetian blinds, although not as effective as draperies, can be adjusted to let in some light and air while reflecting the sun's heat. Some newer blinds are coated with reflective finishes. To be effective, the reflective surfaces must face the outdoors.

A variety of exterior awning and shade styles are available.



Some interior cellular (honeycombed) shades also come with reflective mylar coatings. But they block natural light and restrict air flow. Opaque roller shades are effective when fully drawn but also block light and restrict air flow.

Removing Built-up Heat

You can save energy and money when you ventilate your home instead of using your air conditioner, except on the hottest days. Moving air can remove heat from your home. Moving air also creates a wind chill effect that cools your body.

Ventilation cooling is usually combined with energy conservation measures like shading provided by trees and window treatments, and attic insulation. Mechanical air circulation can be used with natural ventilation to increase comfort, or with air conditioning for energy savings.

Ventilation provides other benefits besides cooling. Indoor air pollutants tend to accumulate in homes with poor ventilation, and when homes are closed up for air conditioning or heating.

Principles of Cooling

Cooling the Human Body

Your body can cool down through three processes: convection, radiation, and perspiration. Ventilation enhances all these processes.

Install additional attic insulation, and sun blocking window treatments.

Convection occurs when heat is carried away from your body via moving air. If the surrounding air is cooler than your skin, the air will absorb your heat and rise. As the warmed air rises around you, cooler air moves in to take its place and absorb more of your warmth. The faster this convecting air moves, the cooler you feel. Radiation occurs when heat radiates across

the space between you and the objects in your home. If objects are warmer than you are, heat will travel toward you. Removing heat through ventilation reduces the temperature of the ceiling, walls, and furnishings. The cooler your surroundings, the less heat you'll attract, and the more of your own excess heat you'll lose.

Perspiration can be uncomfortable, and many people would prefer to stay cool without it. However, during hot weather and physical exercise, perspiration is the body's powerful cooling mechanism.

Ceiling fans distribute cool air, making cooling equipment more efficient.

As moisture evaporates from your skin, it takes a lot of heat with it, cooling your body. If a breeze (ventilation) passes over your skin, that moisture will evaporate more quickly, and you'll be even cooler.

Natural Ventilation

Natural ventilation relies on the wind and the "chimney effect" to keep a home cool.

The wind will naturally ventilate your home by entering or leaving windows, depending on their orientation to the wind. When wind blows against your home, air is forced into your windows. Heat accumulates in your home during the day, and the cool night air can flush it out. For drier climates, this will mean ventilating at night, and closing doors, windows, and window coverings during the day.

The chimney effect occurs when cool air enters a home on the first floor or basement, absorbs heat in the room, rises, and exits through upstairs windows. This creates a partial vacuum, which pulls more air in through lower-level windows.

Natural ventilation works well in our climate with cool summers or cool nights and regular breezes.

Using Windows and Doors for Cross Ventilation

You can create natural cross ventilation by opening your windows and doors, and adjusting the size and location of the openings to ventilate different parts of the home.

Inlets and outlets located directly opposite each other cool only those areas in between, in the direct path of the airflow. You'll cool more of your home if you force the air to take a longer path between the inlet and outlet. Use smaller window openings for the inlets and larger openings for the outlets. This in-creases air speed and improves the cooling effect. Air from cooler, shaded outdoor areas provides the best intake air.

Experiment with different patterns of window venting to move fresh outside air through all the living areas of your home. This may involve leaving some windows closed if they interfere with air moving along a longer path through the home.

Attic Ventilation

Solar heat travels in through the roof and radiates into the attic. Attic ventilation reduces attic temperature 10 to 25 degrees and slows the transfer of heat into the living space.

Mechanical Ventilation

When you know how air moves naturally through your home, you can then optimize your mechanical ventilation.

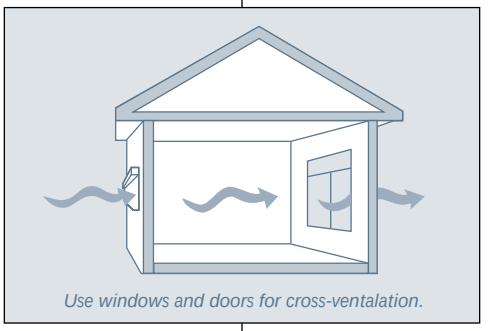
Mechanical ventilation can provide continuously moving air that will keep your

home cooler, day and night, with circulating fans, whole-house fans, and/or evaporative coolers.

The quality and energy efficiency of these devices varies widely. Shop carefully—it might be best to buy from a dealer who specializes in fans rather than from a department store.

Circulating Fans

Circulating fans include ceiling fans, table fans, floor fans, window fans, and fans mounted to poles or walls. These fans create a wind chill effect that will make you more comfortable in your home, even if it's also cooled by natural ventilation or air conditioning.



Use windows and doors for cross-ventalation.

Circulating fans create a wind chill effect to make you more comfortable.

Ceiling Fans

If you use air conditioning, a ceiling fan will allow you to raise the thermostat setting about 4°F with no reduction in comfort. During moderately hot weather, ceiling fans may allow you to avoid using your air conditioner altogether.

Install a fan in each room that needs to be cooled during hot weather. Fans work best when the blades are 7 to 9 feet above the floor and 10 to 12 inches below the ceiling. Fans should be installed so their blades are no closer than 8 inches from the ceiling and 18 inches from the walls.

Larger ceiling fans can move more air than smaller fans. A 36- or 44-inch diameter fan will cool rooms up to 225 square feet, while fans that are 52 inches or more should be used in larger rooms. Multiple fans work best in rooms longer than 18 feet. Small- and medium-sized fans will provide efficient cooling in a 4- to 6-foot diameter area, while larger fans are effective up to 10 feet.

A larger blade will also provide comparable cooling at a lower velocity than a smaller blade. This may be important in areas where loose papers or other objects will be disturbed by a strong breeze. The fan should also be fitted to the aesthetics of the room—a large fan may appear overpowering in a small room.

A more expensive fan that operates quietly and smoothly will probably offer more trouble-free service than cheaper units. Check the noise ratings, and, if possible, listen to your fan in operation before you buy it.

Window and Exhaust Fans

Window fans are best used in windows facing the prevailing wind or away from it to provide cross-ventilation. Window fans augment any breeze or create a breeze when the air is still. Experiment with positioning the fans in different windows to see which arrangement gives the best cooling effect. In a larger house, consider installing a window fan that blows air in through a lower-level window in a cool area and another window fan that blows air out through a higher-level window in a hotter area.

Use exhaust fans in the kitchen and bath to remove heat and humidity when cooking and bathing. Larger, securely installed exhaust fans can ventilate homes where an open window would be a security issue. Large exhaust fans can be mounted outdoors on a wall or roof to reduce indoor noise.

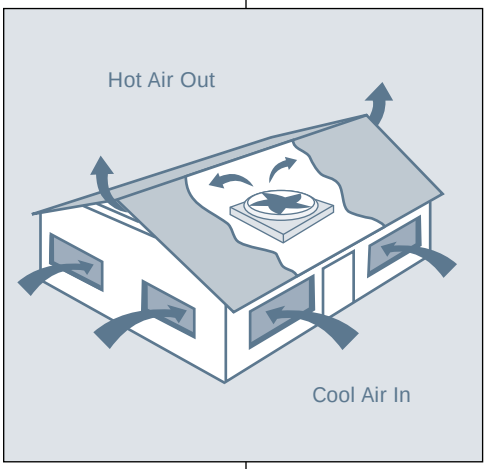
Be cautious with these large exhaust fans. If enough ventilation isn't provided, the fans can pull combustion products (e.g., carbon monoxide from furnaces or water heaters) into your living space.

Whole-House Fans

A whole-house fan can substitute for an air conditioner much of the year. Whole-house fans combined with ceiling fans and portable fans provide acceptable summer comfort for many families, even in hot weather.

How Whole-House Fans Work

The whole-house fan pulls air in from open windows and exhausts it through the attic and roof. It provides good attic ventilation in addition to whole-house ventilation. You can regulate cooling by simply closing windows in the unoccupied areas and opening windows wide in occupied areas. Many people cool the bedrooms at night and the living areas during the daytime.



Whole-house fans should provide houses with 30 to 60 air changes per hour (varies with climate, floor plan, etc.—check with a professional to determine what is appropriate for your home). The air-change rate you choose should depend on how hot your home gets and how much you depend on the whole-house fan for cooling. Homes in cooler, shadier areas don't require as much ventilation as homes in warmer, sunnier ones. Houses entirely dependent on whole-house fans require a bigger fan because there is no air conditioning to fall back on.

Sizing a Whole House Fan

Whole-house fans are sized in cubic feet per minute (cfm) of ventilating air flow rate. To determine the size you'll need, first calculate the volume of your house in cubic feet. To do that, multiply the square footage of the floor area you want to cool by the height from floor to ceiling. Take that volume and multiply by 30 to 60 air changes per hour (depending on the power you need). Then, divide by 60 minutes to get the cubic feet per minute of capacity your house requires. [(Square feet_____ x room height_____) x 30 or 60 – 60 = cfm required _____.]

Installing and Using a Whole-House Fan

Installing a whole-house fan is tricky and should be done by a professional. Attic measurements, dedicated circuit wiring, and possibly new attic vent installation should be performed by an experienced person. Attic ventilation may have to be increased to exhaust the fan's air outdoors.

A whole-house fan can substitute for an air conditioner much of the year.

Some fans come with a tight sealing winter cover (or you can build one). If you switch between air conditioning and cooling with a whole-house fan as the summer weather changes, build a tightly sealed, hinged door for the fan opening that is easy to open and close when switching cooling methods.

Drawbacks of Whole-House Fans

Whole house fans can be noisy, especially if improperly installed. In general, a large-capacity fan running at low speed makes less noise than a small fan operating at high speed. All whole-house fans should be installed with rubber or felt gaskets to dampen noise. You can set a multi-speed fan to a lower speed when noise is a problem.

Evaporative Coolers

Evaporative coolers or swamp coolers are a popular and energy efficient cooling strategy in dry climates of the United States.

Portable evaporative coolers work well in moderate climates.

Hot outside air enters the swamp cooler, and passes over water saturated pads. The energy absorbed by evaporating water into the air reduces the temperature of the air. The 15- to 40-degree-cooler air is then directed into the home, and pushes warmer air out through windows. Because this process also humidifies the air, swamp coolers are best used in areas with low summertime relative humidity.

Evaporative coolers use less than one-third the energy of air conditioners, and generally cost less to install. Unlike central air conditioning systems that recirculate the same air, evaporative coolers provide a steady stream of fresh air into the house.

Sizing and Selection
Evaporative coolers are rated by the cfm of air that they deliver to the house. Most models range from 3,000 to 25,000 cfm. Manufacturers recommend providing enough air-moving capacity for 20 to 40 air changes per hour.

Installation
Evaporative coolers are installed in one of two ways: the cooler blows air into a central location, or the cooler connects to duct-work, which distributes the air to different rooms. Central-location installations work well for compact houses that are open from room to room. Ducted systems are required for larger houses with hallways and multiple bedrooms. Many people install down-flow evaporative coolers on the roofs of their houses. However, many experts prefer to install ground-mounted horizontal units, which feature easier maintenance and less risk of roof leaks.

Small horizontal-flow coolers are installed in windows to cool a room or section of a home. These portable evaporative coolers work well in our climate. Room evaporative coolers are becoming more popular in areas of the western United States with milder summer weather. They can reduce the temperature in a single room by 5 to 15 degrees.

Operation
An evaporative cooler should have at least two speeds and a vent-only option. During vent-only operation, the water pump does not operate and the outdoor air is not humidified. This lets you use the evaporative cooler as a whole-house fan during mild weather.

Control the cooler's air movement through the house by adjusting window openings. Open the windows or vents on the leeward side of the house to provide 1 to 2 square feet of opening for each 1,000 cfm of cooling capacity. Experiment to find the right windows to open and the correct amount to open them. If the windows are open too far, hot air will enter. If the windows are not open far enough, humidity will build up in the home. You can regulate both temperature and humidity by opening windows in the areas you want to cool, and closing windows in unoccupied areas.

Where open windows create a security issue, install up-ducts in the ceiling. Upducts open to exhaust warm air as cooler air comes in from the evaporative cooler.

Evaporative coolers installed with upducts will need additional attic ventilation. Filters remove most of the dust from incoming air—an attractive option for homeowners concerned about allergies. Filters can also reduce the tendency of some coolers to pull water droplets from the pads into the blades of the fan. Most evaporative coolers do not have air filters as original equipment, but they can be fitted to the cooler during or after installation.

Fan Noise Levels

- When shopping for circulating fans, be sure to test the fan for noise. Listen to the different qualities of each fan's sound. Fans also will be marked with their rated noise level, measured in "sones." Very quiet fans are rated at 1.5 sones. Some are so quiet, they're rated as low as 0.5 to 1 sones.
- Poor installation can affect a fan's noise level. If a fan isn't installed securely, it can vibrate and rattle, making as much noise as a poorer quality fan.
- Your fan will probably run for a good part of the day—be sure it's quiet as well as cooling.

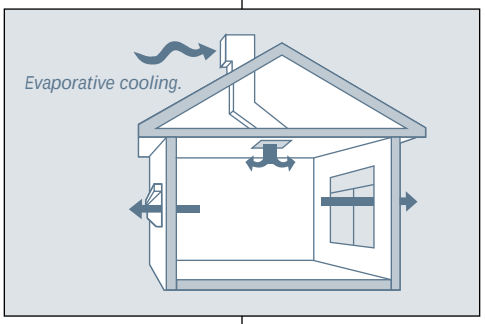
Evaporative Cooler Maintenance

Save yourself a lot of work and money by draining and cleaning your evaporative cooler regularly. Build-up of sediment and minerals should be regularly removed. Coolers need a major cleaning every season, and may need routine maintenance several times during the cooling season. The more a cooler runs, the more maintenance it will need.

Look at the pads, filters, reservoir, and pump at least once a month. Replace the pads at least twice during the cooling season, or as often as once a month during continuous operation. Some paper and synthetic cooler pads can be cleaned with soap and water or a weak acid according to manufacturer's instructions. Filters should be cleaned when the pads are changed or cleaned. Caution: Be sure to disconnect the electricity to the unit before servicing it.

Two-Stage Evaporative Coolers

Two-stage evaporative coolers are newer and even more efficient. They use a pre-cooler, more effective pads, and more efficient motors. They don't add as much humidity to the home as single-stage evaporative coolers, but are still much more efficient than air conditioners.



Drawbacks of Evaporative Coolers

Evaporative coolers should not be used on humid days because they add humidity. Also, they cool your house down to a higher temperature than an air conditioner would. They require maintenance (albeit easy) about once a month. If the cooler is installed on the roof, there is some roof deterioration caused by routine maintenance trips. A sunlit rooftop cooler will be about 1 degree Fahrenheit less effective than a shaded cooler. Rooftop maintenance also requires using a ladder, which may be an inconvenience.

Managing Your Home's Ventilation

Remember the following if you plan to cool your home with ventilation:

- Learn how air flows naturally through your home.
- Take advantage of cool night air, and ventilate your home by natural or mechanical methods.
- Keep a clear path for airflow both inside and outside your windows.
- Close windows, doors, and window coverings in the morning before your home starts to heat up.
- Avoid producing heat in your home when it's hot outside.
- Wear cool clothing.

Reducing Heat-Generating Sources

Often-overlooked sources of interior heat gain are lights and household appliances, such as ovens, dishwashers, and dryers.

Because most of the energy that incandescent lamps use is given off as heat, use them only when necessary. Take advantage of daylight to illuminate your house. And consider switching to compact fluorescent lamps. These use about 75% less energy than incandescent lamps, and emit 90% less heat for the same amount of light.

Many household appliances generate a lot of heat. When possible, use them in the morning or late evening when you can better tolerate the extra heat. Consider cooking on an outside barbecue grill or use a microwave oven, which does not generate as much heat and uses less energy than a gas or electric range.

Washers, dryers, dishwashers, and water heaters also generate large amounts of neat and humidity. To gain the most benefit, seal off your laundry room and water heater from the rest of the house.

New energy-efficient appliances generate less heat and use less energy.

New, energy-efficient appliances generate less heat and use less energy. When it is time to purchase new appliances, make sure they are energy efficient. All refrigerators, dishwashers, and dryers display an EnergyGuide label indicating the annual estimated cost for operating the appliance or a standardized energy efficiency ratio. Compare appliances and buy the most efficient models for your needs.

Cooling Strategies Checklist

Cooling Strategies to Consider	Cost ($)	Action: Yes/No
Lighten exterior wall color		
Add reflective coatings to windows		
Insulate attic and walls		
Caulk and weatherstrip to seal air leaks		
Add shade tress, bushes, or vines		
Add exterior awnings and shades		
Add interior drapes and shades		
Increase natural ventilation		
Install ceiling fan(s)		
Install a whole-house fan		
Install an evaporative cooler		
Isolate heat-generating appliances		
Replace heat-generating appliances		
Replace light bulbs with energy-efficient fluorescents		

Source List

The following are sources of additional information on alternative cooling strategies that can help you keep your cooling costs down. The mention of a source does not constitute a recommendation or endorsement.

U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy (EERE)
www.eere.energy.gov

Provides access to thousands of documents and other resources related to energy efficiency and renewable energy.

EERE's "Ask an Energy Expert"
(877) 337-3463
www.eere.energy.gov/informationcenter

Energy experts provide free general and technical information on many topics and technologies pertaining to energy efficiency and renewable energy.

Energy Star
U.S. Department of Energy and Environmental Protection Agency
(888) STAR-YES (782-7937)
www.energystar.gov

Provides lists of energy-efficient products, including ceiling and ventilating fans, windows, and reflective roof products.

Consumer Energy Center
California Energy Commission
Media and Public Communications Office
1516 Ninth Street, MS-29
Sacramento, CA 95814-5504
(916) 654-4287
www.consumerenergycenter.org/home/heating_cooling/index.html

Provides information and consumer tips related to home energy efficiency, fans, and evaporative coolers.

Home Energy Magazine
1250 Addison Street 211B
Berkley, CA 94704
(510) 524-5405
www.homeenergy.org

Provides information on reducing energy consumption in the home.

Additional Reading

The following publications provide additional information on alternative cooling methods. The mention of a publication does not constitute a recommendation or endorsement.

To obtain the publications in this list, contact your local library, or the publisher, or visit the web page if referenced.

Reports and Fact Sheets

"Landscaping for Energy Conservation", L. Walker, Colorado State University Cooperative Extension, Fact Sheet no. 7.225, Updated May 2010.
www.ext.colostate.edu/pubs/garden/07225.html

"Landscaping for Energy Efficiency," available from EERE (see Source List)
Document No. DOE/GO-10095-046, April 1995
www.nrel.gov/docs/legosti/old/16632.pdf

"How to Install and Use a Whole House Fan," available from EERE (see Source List)
Document No. DOE/GO-10099-745, FS220, March 1999
www.nrel.gov/docs/fy99osti/26291.pdf

Articles

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