

Home Cooling Fact Sheet



Stay Cool, Comfortable, and Cut Costs.

These simple tips
can slash your cooling
costs by hundreds of dollars

How to make your cooling system more energy efficient

Cutting cooling costs is easy when you know what to do. A poorly maintained air conditioner uses 10-30% more energy than necessary. But if you follow these simple steps, you'll be well on your way to cutting your energy bills.

1. COMPLETE SYSTEM MAINTENANCE

Have a yearly safety check and tune-up. Each spring, a licensed heating and air conditioning technician should service your system. It's a small investment considering that you may spend as much as \$500 on cooling your home in just one season.

For safety, the technician should inspect and test electric panels, breakers, fuses and wiring. In addition to a cooling system inspection, have the gas piping and the furnace's heat exchanger checked for leaks. Consult your owner's manual and have any additional recommended work performed. Get any safety problems fixed before running the equipment.

A tune-up consists of cleaning the coils, straightening the coil fins, oiling the blower fan and checking the air flow and refrigerant level. If the refrigerant is low, there is probably a leak - and federal law says that leaks must be repaired before adding more refrigerant. Your technician will need proper U.S. EPA certification to handle refrigerants. After recovering the refrigerant, the technician can use a vacuum pump to test the lines for leakage, then fix any leaks and add the right amount of refrigerant. Look for a licensed technician who follows a written step-by-step procedure and gives you a report on your system both before and after servicing.

2. THE OUTSIDE UNIT

Clear away weeds and debris. If air can't circulate freely around your outside unit, you'll have higher bills and more service calls. Never cover it with a shed or a deck. Shading the unit can help - as long as air flow is not hindered.

3. THE INSIDE UNIT

Replace or clean dirty filters. Dirty air filters are the #1 cause of air conditioning service calls. But filters are easy to replace, and you can do it yourself. Put in a new one every month during the summer. Be sure all hardware is replaced and securely reattached.

You may want to consider a permanent filter that you wash clean instead of replacing. Some permanent filters restrict air flow too much for some units, though, so check first with a qualified technician or your unit's manufacturer.

4. DUCT WORK

Repair disconnected ductwork. Disconnected ductwork is a common and very costly problem. If a supply duct has worked loose from a vent or a connecting duct, the air from your cooling system never reaches the rooms in your house. It spills into your home's attic or crawl spaces and eventually leaks outside. So in effect, you're paying to cool the outdoors.

In addition, if a return duct in your attic is disconnected, you're drawing superheated attic air - up to 140° - into your system. This forces your system to work even harder, and makes you less comfortable.

To check for disconnected ductwork, examine the ducts in your basement, attic and crawl spaces. Remember to keep safety in mind when climbing ladders or crawling in attics. Remove the vent grills in each room and make sure the ductwork is securely attached and sealed to the floor or wall. Rooms in your home that never seem to get cool enough may be a sign of disconnected ductwork.

Check for Crushed Ducts Crushed ductwork is another reason some rooms never cool. You can check your ductwork yourself by looking in the attic and crawl spaces, but you may want to have damaged sections replaced by a professional.

Seal Leaks Leaky ductwork is a common problem. As a matter of fact, about 25% of every dollar spent on cooling can be lost through leaky ducts. Examine your ductwork for cracks, splits or bad connections. Turn on your system and feel for escaping air. Look for tell-tale black marks on the duct's insulation, especially around the joints. These are caused by dirt collecting around air leaks. Be sure to seal leaks carefully with mastic-type sealant, not duct tape, which will deteriorate over time.

If your furnace is in the garage, make sure that all possible leaks in the return-air path are sealed. Otherwise, unwanted fumes can be sucked into the house through those openings. Some furnaces sit on a raised platform in the garage, and extra care is needed to seal this type of return-air path. Ask a qualified contractor to check your system if you have any concerns.

Heating and cooling contractors are beginning to offer verified duct sealing services. These contractors are trained in the use of test equipment that measures the amount of leakage in ducts before and after repairs are made. This not only verifies that leaks have been repaired, but also allows the technicians to find and fix hidden leaks.

Insulate ducts. Most ducts are accessible - look for them in crawl spaces and attics. Insulate exposed portions using R-4 or higher fiberglass duct wrap. If existing insulation is dirty at the duct joints, there is probably a leak, and you will want to repair all leaks and damage before insulating.



5. THE THERMOSTAT



Set it at 78°. After tuning up your system and correcting any problems, the next step in cutting your cooling costs is to adopt some simple energy-Save habits. For instance, you can cut your system's operating costs by 20% or more simply by setting your thermostat 6° higher. If everyone did this, the U.S. could save the equivalent of 190,000 barrels of oil per day. In our California climate, it's possible to be comfortable at temperatures above 80° with the simple use of room fans.

Shut it off when you're not home. Don't waste money by cooling your house while you're away at work or on vacation. If you keep shades and curtains drawn it usually won't take much energy to cool your house down when you return. However, if you turn the air conditioner off on the very hottest days and turn it on when you return from work, it may run constantly without cooling down your home very fast. One solution is to use a programmable thermostat to keep the temperature 4-6° warmer while you're away, then automatically return the temperature back down to around 78° an hour or so before you return.

Don't overcompensate with your thermostat setting - remember, thermostats are merely on-off switches. Setting the control to 60° won't cool your house any faster and it will waste additional energy if you forget and leave it running at the low setting. The best setting typically for summertime is 78° or above.

6. VENTILATION

Ventilate when it's cool outside. Most areas of California have cool, dry nights after even the hottest days. Cut your cooling costs by opening windows when it's cooler outside than inside. You can often cool your home down into the 60's with simple ventilation. In the morning, close up the house to trap the coolness inside. Just remember to keep security in mind with open windows. Some windows have a lock that leaves a 2-3" opening. Other windows are secure due to their location. But even if you must shut the windows when you go to bed, the cooling gained in the meantime is worthwhile.

Consider a whole-house fan. Because some nights are cool, but have no breeze, you may benefit from using a whole-house fan to force cool air through your home. A whole-house fan is permanently installed in your attic and draws cooler air into your home and forces warmer air out through your attic vents. Make sure there are enough vent openings so the fan can work properly. The fan will need to meet building and electrical codes, and it should have a safety device to turn it off in case of a fire. If the attic has blown-in insulation, you'll also need certain measures installed to ensure that the fan won't produce a blizzard of flying insulation!

Ventilate your attic. Your attic can reach temperatures exceeding 140°. You can save up to 10% on your cooling bills by installing vents in the roof eaves and along the ridge. Eave and ridge vents must be equal to each other in overall size for the air to flow freely. In combination with a whole-house fan which exhausts air into the attic, this will help remove heat that has built up during the day in your home.

7. LANDSCAPING

Plant shade trees. Shading your house with trees can make a surprising difference in your cooling bills. Deciduous trees planted on the east, south or west side of a house, the sunniest sides, can reduce your cooling load in hot summer months by up to 30%. Planting shrubs next to your home can also help. Vines or trellises placed directly on a west wall can lower the wall's surface temperature by as much as 40°, making it easier to keep your home cool inside. Just remember to keep fire safety in mind when deciding what and where to plant.

Ground covers and lawns can also help keep your home naturally cool. A lawn is 10-15° cooler than bare ground. To save water and money be sure to select drought-tolerant plants.

Install shade devices. Shade screens and tints on windows and glass doors, as well as window and wall awnings, are very effective forms of passive cooling. Shading windows and walls on the sunny sides of your home can cut your cooling needs considerably.



What to look for in a new system

If you're in the market for a new air conditioning system, you can save yourself hundreds of dollars in summer energy bills.

HERE'S HOW

Buy a unit with the highest Seasonal Energy Efficiency Ratio (SEER) rating. Use the SEER to compare different air-conditioning units. SEERs for air conditioners range from 9.7 to 17. The higher the SEER, the more electricity you'll save. For example, going from a SEER of 6 to a SEER of 12 could cut your cooling bill in half.

For maximum efficiency, ask your contractor to make sure the efficiency ratings for the indoor and outdoor coils match. Have the contractor install removable airtight access panels in the indoor unit so a service technician can clean the cooling coil easily.

Don't buy an oversized unit. A unit that's too big for your needs will waste energy and money. When replacing a unit, the existing size may be too large if you've improved your home or if trees are now shading the house and windows. Ask your contractor for an exact heat-gain calculation that shows the proper size of unit to buy for your climate, house size, insulation level and number of windows. Do not count on rule-of-thumb estimates as they tend to be inaccurate, and may end up costing you money.

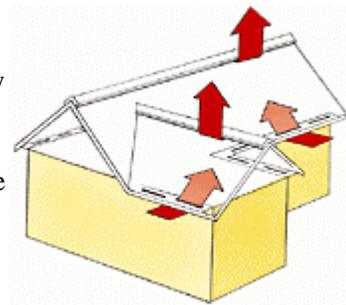
Locate the outside unit properly. Install it in a cool, shaded spot about two feet from the north or east side of your home. Avoid direct sunlight, which makes the unit work harder, and keep the unit away from other objects. For example, don't enclose the unit with a deck or shrubbery - it needs room to breathe.

Other Cool Ideas

WEATHERIZE YOUR HOME

Make sure your home is properly weatherized. While proper ventilation that you control is necessary to allow enough fresh air into your home, you should eliminate all unnecessary leaks. Seal any cracks, holes or gaps, especially around plumbing and other penetrations through your ceilings, walls and floors. Caulk around windows and doors, and keep your fireplace damper closed when the fireplace is not in use.

It's especially important that your ceilings, walls and floors should be adequately insulated. Insulation is rated by R-value - the higher



the R-value, the more effective the insulation. At a minimum, your ceiling should be insulated to R-30, your walls to R-11 and your floors to R-19. Some types of attic insulation settle over time or may be unevenly distributed and need to be upgraded to achieve at least R-30.

TAKE A LOOK AT YOUR WINDOWS

If you're thinking of getting new windows, consider installing double-paned windows. They insulate as effectively as an inch of foam insulation and shade as well as tinted windows, yet look clear. These types of windows are available from many manufacturers.

USE LIGHT COLORS ON EXTERIORS

Painting walls or re-roofing with light colors will help keep interiors cooler. A white wall, for example, reflects 80% of the light that strikes it, greatly reducing heat gain and the resulting higher temperatures in your home.

CONSIDER AN EVAPORATIVE COOLER

This low-cost cooling method works by drawing air through a wet pad. The temperature of the ambient air evaporates the water in the pad, resulting in a cooling of the output air. This cool air is then blown into the living space by the unit's fan.

Some homes use attic vents that are opened automatically by the evaporative cooler, allowing a free air exchange while letting the conditioned indoor air cool the attic on its way out.

Evaporative cooling works well in California's dry climates. It is most often used in warm areas between the hot central valley and the cool coast and mountain areas. The price for an evaporative cooler is as little as one-fourth the cost of a central air conditioner, and operating costs are only one-fifth as much. Consider this option if you're adding cooling to a house without ductwork, you want lots of fresh air, costs are critical and regular maintenance isn't a problem. It's not a good option if you want to keep temperatures automatically below the low 70s.

Recently, manufacturers have introduced a major improvement in evaporative cooling. Dual cooling methods are used, making the air 6 to 8 degrees cooler than with a conventional evaporative cooler while using only half of the energy. These "two-stage" systems should become more common in the future.

A homeowner or handyperson can do the simple but regular maintenance required on an evaporative cooler. However, some of the least expensive units can rust through and may need replacing every 5-10 years. An evaporative cooler needs regular cleaning because it's an excellent filter, trapping a lot of dust and pollen. Cleaning is as simple as washing the unit out with a hose, which is especially easy if the unit is mounted on a wall or through a window.

Save Money

Chances are you're spending more on air conditioning than you need to because your cooling system is out of tune. It's probably wasting money and adding to the strain on the environment. The good news is that it's probably an easy problem to fix.

SAVE MONEY - AND IMPROVE YOUR COMFORT

Air conditioning is a major energy consumer - accounting for as much as half of summer energy bills. By simply making sure that your cooling system is running efficiently, you could save yourself hundreds of dollars a year. Best of all, you don't have to sacrifice comfort to save on your cooling bills. In fact, you may actually be more comfortable once your system is working efficiently.

SAVE THE ENVIRONMENT

In addition to Save money, an efficient cooling system conserves natural resources and reduces air emissions. If you're concerned about our environment, keeping your cooling system tuned-up is something you can do to help.

TAKE ACTION NOW

The sooner you begin improving the efficiency of your cooling system, the sooner you'll start Save energy and money. Take a moment to read through the simple energy-Save tips inside.

There's a chance that your cooling system may be too old and needs replacing. If so, be sure to read the section on choosing a new system titled "What to Look for in a New System".

Most importantly, before you buy, call PG&E's Smarter Energy Line at 1-800-933-9555 for the latest information about PG&E programs that may help you save energy and money.

Home Cooling Energy Save Checklist

DAILY

- ✓ Don't lower your thermostat below 78°, health permitting.
- ✓ Turn your air conditioner off or to a warmer temperature when you aren't home.
- ✓ Close curtains, draperies or shades.
- ✓ Use room fans to increase comfort.
- ✓ Avoid baking and other indoor heat-producing activities on hot days.
- ✓ Ventilate when it's cooler outside than inside.

MONTHLY

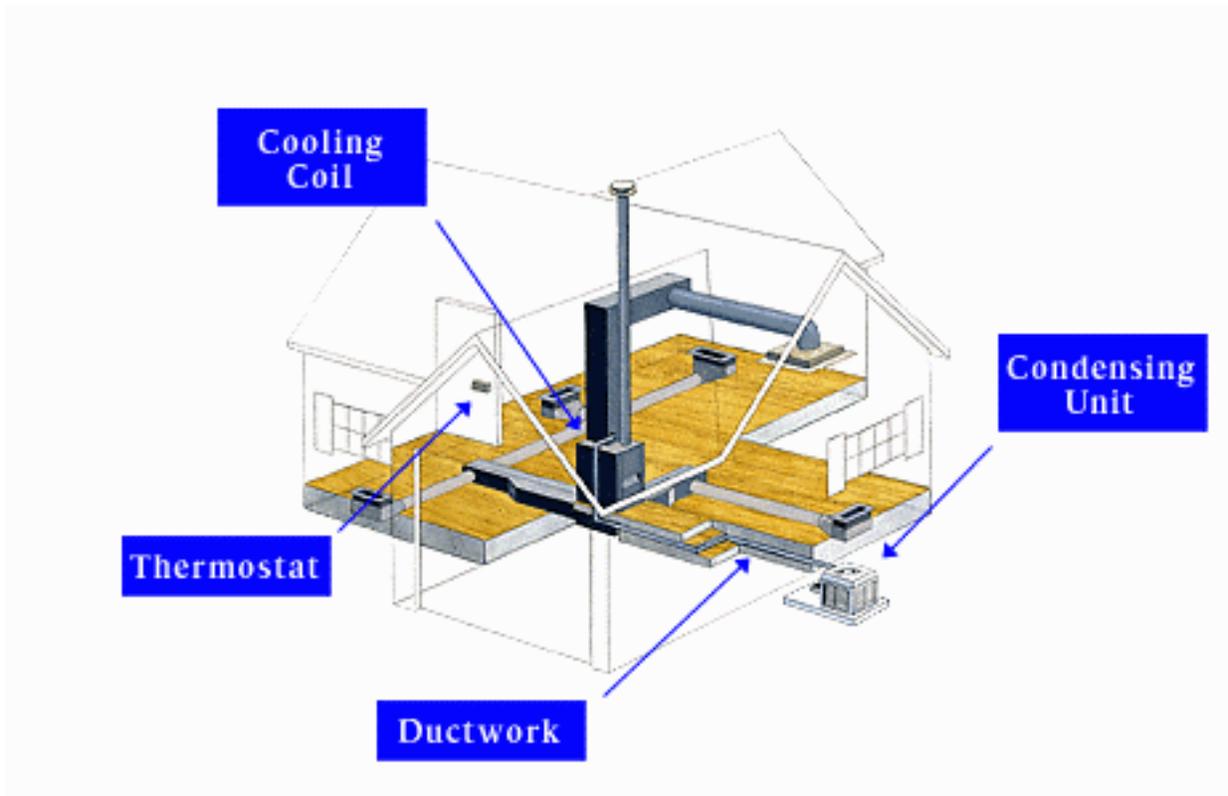
- ✓ Change filters or clean permanent filters.
- ✓ Clear weeds and other debris away from the outside condensing unit.

EVERY SPRING, HAVE A QUALIFIED, LICENSED HEATING & COOLING PROFESSIONAL:

- ✓ Check system safety devices for proper functioning.
- ✓ Check system air flow.
- ✓ Clean the inside coil.
- ✓ Clean and straighten the outside coil fins.
- ✓ Check for refrigerant leaks, and repair and recharge the system.
- ✓ Clean and oil the fan motors and service other components.
- ✓ Inspect ductwork and repair any damage and seal any leaks.
- ✓ Check the total system for proper and efficient operation.

How your cooling system works

Save money and energy by making sure each component of your system is running efficiently.



Air conditioners work a lot like your refrigerator. A fan blows air across a cold evaporator coil and then sends this cool air into your house through the supply ducts. Warm air is drawn into the return ducts and is sent back into the system to be cooled. A refrigerant takes the heat to the outside unit, where it is dissipated to the outdoors.

For additional energy Save information call PG&E's Smarter Energy Line
at 1-800-933-9555