Home Heating Fact Sheet

Take care of the system that takes care of you

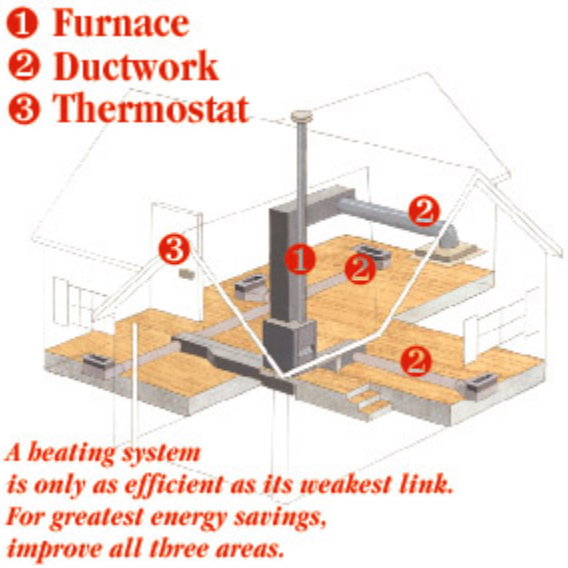
YOU SAVE MONEY, ENERGY AND THE ENVIRONMENT WHEN YOU KEEP YOUR CENTRAL HEATING SYSTEM RUNNING RIGHT

Greater Comfort, lower heating bills, a cleaner environment

You don't need to be an engineer to make your heating system run more efficiently. Most of the steps outlined here are simple, common-sense actions that involve little time, money or effort on your part. Yet, a few simple actions can greatly improve energy efficiency, make a big difference to your personal comfort and save you money.

HOW A HOME HEATING SYSTEM WORKS

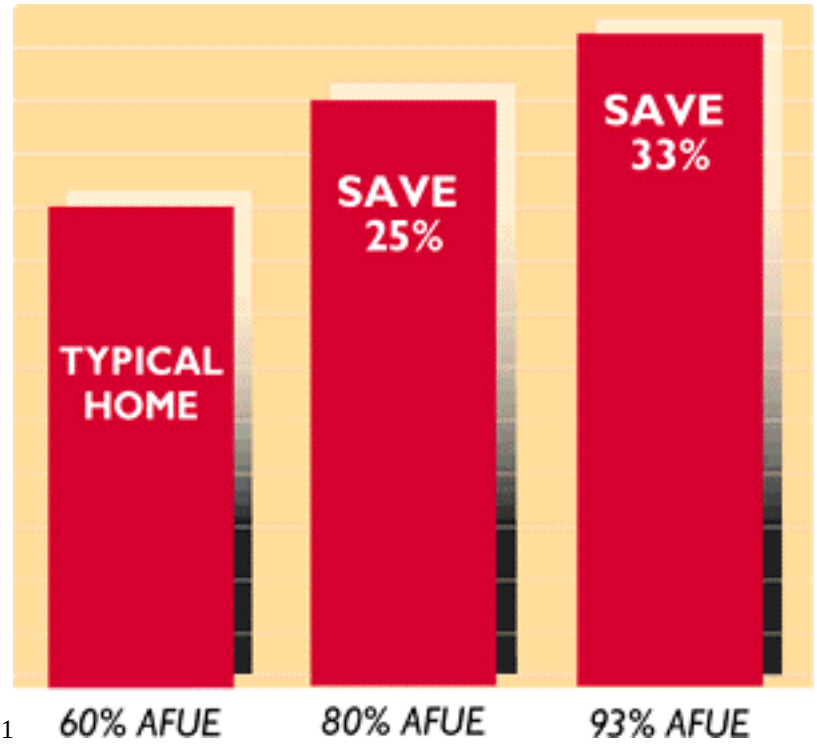
All central heating systems have three basic components: a heat source (the furnace), a circulatory system (the ductwork) and an on/off switch (the thermostat). All three work together to keep your home warm.



When the temperature in your home drops below the setting on your thermostat, it activates the burner in your furnace. The heat is collected in a heat exchanger. A fan blows air across the heat exchanger and sends the heated air into your house through your duct system. Cooler air is drawn into the return ducts and sent back to the furnace to be heated again. This is called a recirculating system and is designed to increase efficiency.

This cycle continues until the temperature in your home matches the setting on your thermostat, which then shuts off the system.

ANNUAL FUEL UTILIZATION EFFICIENCY - AFUE



Furnaces are rated on how efficient they are. Their efficiency, which basically means how much energy is turned into usable heat in your home, is determined by Department of Energy standards. These standards are called AFUE, Annual Fuel Utilization Efficiency. These standards are listed in the manufacturer's literature and can be determined by asking your heating contractor. The higher the AFUE, the less energy the system will use and the less money it will take to heat your home.

Whether it's fueled by gas or electricity, the average existing home heating system is only about 60% efficient -- and that's when it's in top working condition. Unfortunately, many home owners don't know how to adequately maintain their systems and the real efficiency may be less than 50% -- and they pay a high price for it.

EFFICIENCY SAVES ON ENERGY BILLS

A heating system is often the biggest single consumer of energy in the home, accounting for up to two-thirds of a household's winter energy bill.

Experts agree that tuning up your heating system is one of the single most important actions you can take to keep your monthly heating bills under control. It will keep your home more comfortable as well.

ENERGY EFFIENCY SAVES THE ENVIRONMENT

An energy-efficient heating system saves more than money. It saves natural resources, reduces air emissions and helps create a cleaner environment for all of us.

Be sure to continue reading through the practical energy-saving tips in this fact sheet, and begin saving energy and money today.

The Furnace

The first place to look for potential energy savings is the furnace itself. Just taking care of the following routine maintenance items could save 10% or more on your heating bills.

KEEP IT RUNNING CORRECTLY

TEST AND ADJUST YOUR UNIT: We recommend that you call a heating professional for a complete annual checkup of your heating system to make sure it's in safe operating condition.

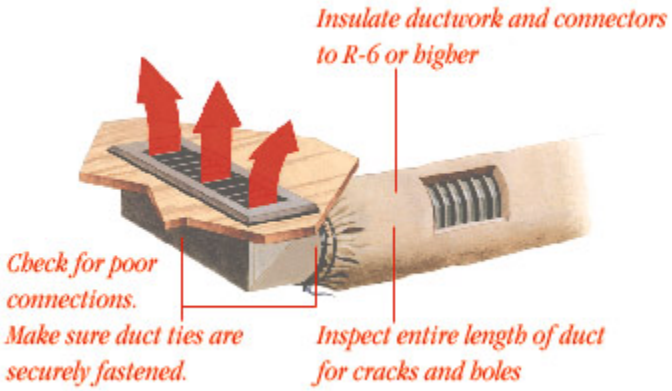
CLEAN OR REPLACE FURNACE FILTERS REGULARLY: Most furnace filters are disposable. Some filters are washable and can be cleaned when clogged or dirty. Checking the filters in your system once a month during times of high use will help insure proper airflow. Be sure to keep a couple of correctly sized filters on hand if yours are disposable. If you are installing a high efficiency filter, make sure that the airflow through the furnace can be maintained at the proper level.

The Ductwork

Ductwork can be a major cause of heat loss. In fact, PG&E research shows that faulty ductwork accounts for more than 25% of the heating loss in an average California home. That means dollars out of your pocket. The good news is that ductwork problems are relatively easy and inexpensive to correct.

STOP ENERGY - DRAINING LEAKS

REPAIR DISCONNECTED DUCTS: Disconnected ducts are common and a big source of heat loss -- yet they are simple to reattach with duct ties and mastic. If an attic or crawl space duct comes loose and goes unrepaired, you can loose a tremendous amount of heat and money. In essence, you could be paying hundreds of dollars a year to heat the outdoors. The disconnected ducts also unbalance the recirculation of the heating system, which can create unsafe operating conditions.



If you have a room that never gets warm, check behind vents or in crawl spaces for disconnected or crushed ducts.

SEAL LEAKS: Either you or a professional heating contractor should check the entire length of your ductwork for leaks, even very small ones. Turn the furnace on and feel along the duct for escaping warm air. Also look for tell-tale black marks on the duct's insulation -- these are usually the signs of leaks. Have your heating contractor seal any leaks carefully with mastic-type sealant – not duct tape. Duct tape is not a long term fix. Don't forget to seal leaks where your furnace connects with your ductwork.

It's now possible for a contractor to perform verified duct sealing by using a special fan to test duct system leakage before and after sealing efforts have been made. Research shows that verified duct sealing allows the contractor to be sure that the real leaks in the ducts are repaired.

INSULATE DUCTS IN UNHEATED SPACES: Most heating ducts are in crawl spaces, attics and outdoor locations. If your ducts aren't already insulated, do it now using R-6 or higher fiberglass duct wrap. Check to ensure that hanging flexible ducts are supported every four feet with an inch and a half wide, or wider hanging strap.

> Insulate
> Adding insulation to your attic area, walls and floors will substantially improve the efficiency and comfort of your home.

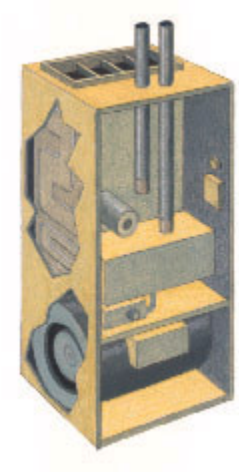
Selecting a heating system for your home

If you're remodeling or your current furnace is getting old, consider buying a more efficient model. A new furnace will have a minimum efficiency of 80%.

WHAT TO LOOK FOR IN A NEW SYSTEM

The climate zone in which you live, the insulation in your home and the heating usage pattern of your household will influence the payback you receive when purchasing a new furnace.

Ask yourself these simple questions before proceeding: First, are you going to be doing any remodeling or room additions that might require the furnace to be moved, or a larger furnace installed? Second, are you planning to insulate your home or replace your windows in the near future? These changes may allow you to install a more efficient furnace.



A HIGH ANNUAL FUEL UTILIZATION EFFICIENCY (AFUE). All furnaces should have this efficiency rating. The higher the AFUE, the more efficient the unit. Federal Appliance Energy Standards of 1993 essentially require manufacturers to make units with an AFUE of at least 80%, and there are units available up to 96% efficient.

HOW EFFICIENT IS THE FAN BLOWER MOTOR? Some newer furnaces have electronically commutated, or ECM, blower motors that are considerably more efficient than standard motors. A fan blower motor is used to push the heated air throughout the ductwork system and through your home. Also, some people like to run their furnace fans all year long for such things as comfort or air cleaning. The cost to operate a standard furnace fan in this way could run about $250 per year. However, a furnace with an ECM motor used in the same manner would cost about $50 per year. When shopping for a new furnace consider purchasing one with an ECM motor.

HOW MUCH ARE YOU CURRENTLY SPENDING TO HEAT YOUR HOME?

You can get a rough estimate of your heating costs by looking at your monthly gas bills in the summertime and subtracting those gas bills from what you are paying in the winter. For example, if you are paying $22 for natural gas in July, and you are paying $122 for natural gas in January, that means you are spending about $100 to heat your home in January. If you take your gas bills for November, December, January, February and March, you can get a rough idea of how much you are spending to heat your home. For example, after doing these calculations you might determine you are spending about $500 a year to heat your home. If you were to replace your existing furnace, which is most likely about 60% efficient, with a new furnace that is 80% efficient (the minimum now allowed by law), you would be saving approximately 25% (or 25 cents), on every heating dollar. If you multiply your $500 yearly cost by that 25 cent savings per dollar, you get an annual savings of $125. If you would replace your furnace with a 93% efficient furnace, you would be saving about 35 cents on every heating dollar. Therefore, for one year you would save $175. So you can see you can save a considerable amount of money on your heating bill by replacing your furnace with a higher efficiency model.

HOW MUCH ARE YOU WILLING TO SPEND? A new furnace installation can cost anywhere between $1,000 and $3,500, depending upon the complexity of your specific installation. High efficiency models might cost an additional $500 to $1,000 for the added efficiency. If your family has high annual heating bills, a higher efficiency furnace is going to make more economic sense than it would for a family that has very small heating bills. So when determining how efficient a furnace to buy, take into account what you are spending on your annual energy bills. If you are going to be in your home for a period of time that would justify this additional expense, it makes sense to install the highest efficiency furnace that you can afford. A new high efficiency furnace may also increase the resale value of your home.

Other factors that determine your annual heating cost are:

- The size of your home
- How well your home is insulated
- The draftiness of your home
- The amount of leaks in your ductwork
- The temperature at which you keep your home during the winter season
- The number and type, or efficiency level, of windows you have in your home

SIZING THE FURNACE

Buying the proper size of furnace for your home is just as important as its efficiency. If you buy a furnace that_s too big for your home, it will have short cycle-times and its efficiency will be significantly reduced. A furnace that is properly sized costs less to operate. When talking to your heating and cooling contractor, be sure to have them perform a heat-loss, heat-gain calculation, and do not rely upon rule-of-thumb estimates -- they are often inaccurate. The heat-loss, heat-gain calculation takes into account:

- The size and configuration of your house
- The levels of insulation in your walls, ceilings, 2nd floors
- The number and type of windows in your home
- The orientation of your home to the sun
- Plus many other important considerations

Therefore, asking for a heat-loss, heat-gain calculation will assure you that the furnace is correctly sized for your home.

Some of the higher efficiency furnaces even come with two-stage burners. These two-stage burners allow the furnace to operate at lower burn rates using less gas when the heating demand on the home is low. During times of greater heating demand, the second stage burner is employed to meet the higher heating needs of the home. If you live in a large home, the additional savings from these features may well be worth the cost.

SELECTING A CONTRACTOR

- Be sure to verify the credentials of your contractor. Ask to see current proof of a valid contractor_s license. If in doubt you can always call the Contractors State Licensing Board (CSLB) at 1-800-321-2752.
- Make sure your contractor is adequately covered for workers' compensation, liability and property damage. Ask to see current certificates of insurance coverage.
- You can always contact CSLB for disclosure of any complaint history about your contractor.
- Always ask your contractor for several references and check these references yourself.
- Always make sure that all work to be done is included in the written contract. Do not rely on verbal understandings for the cost of materials or services.

- Obtain multiple bids and never be pressured into signing a contract.
- Don't make final payment until you_re satisfied with the work.

ADDITIONAL TIPS FOR HEATING SYSTEMS

New furnaces often have different venting and flue requirements. When replacing your furnace make sure your contractor:

- Accesses your existing flue
- Follows new code requirements for venting furnaces and water heaters
- Obtains necessary permits and inspections

The Thermostat

The thermostat is the brain of your heating system. The more wisely you use it, the more money you'll save.

DEVELOP ENERGY-SAVING HABITS

TURN IT DOWN WHEN YOUR NOT AROUND: Don't pay for heat you don't need -- keep your thermostat low while you're away at work or on vacation.

It takes less energy to warm a cool home in the evening than to maintain a warm temperature all day long.

DON'T CRANK IT UP: Thermostats are like light switches, not gas pedals. All they do is turn your furnace on and off. Setting the dial to 90^{o} won't heat your home any faster. But it will overheat the house and waste lots of energy if you leave it at that high setting.

KEEP IT LOW AT NIGHT: 68^{o} is great for daytime use. But you can trim your heating bills by 5% to 15% -- or more -- by setting your thermostat even lower at night, consistent with any health, comfort and safety requirements.

Set your thermostat to 68 degrees or lower.

INSTALL A PROGRAMMABLE UNIT: To enjoy savings and make yourself comfortable when you need to be, install an inexpensive "setback" thermostat. They range widely in cost and features, but even the lower cost ones will do the job. You can program them to turn your furnace off and on at set times. For example, you can program your thermostat to shut the furnace off an hour after you go to bed, and turn it on an hour before you get up -- automatically saving energy.

Programmable Thermostat

Be sure to locate the thermostat properly -- five feet above the floor on an interior wall away from windows, drafts, heating registers and return air grills. Unless you are certain about how the thermostat should be wired, it is wise to have a professional heating contractor install the thermostat.