



# Home Heating & Cooling

Up to half your home's energy goes to heating and cooling. With proper home sealing, a programmable thermostat, and a well-maintained, energy-efficient heating and cooling system, you can save as much as 20% annually on total energy costs

If your HVAC equipment is more than 10 years old or not keeping your house comfortable, you should have it looked at by a professional HVAC contractor. But before you invest in a new HVAC system, make sure that you have addressed the big air leaks in your house and the duct system. Sometimes, these are the real sources of problems rather than your HVAC equipment.

Your new heating and cooling system should be a custom fit for your home. Your contractor should determine the right size for your HVAC equipment by using ACCA/ANSI Manual J or an equivalent sizing calculation tool that takes into account specific information about your home.

In houses with forced-air heating and cooling systems, ducts are used to distribute conditioned air throughout the house. In a typical house, however, about 20 - 40 percent of the air that moves through the duct system is lost due to leaks and poorly sealed connections. A good contractor should be able to test your air ducts to identify and seal leaks. Duct sealing should be done by a professional using mastic, or aerosol-based sealing. In some instances, your contractor may advise you that it is necessary to replace or add ducts.

After properly sealing air and heat leaks, an adequate ventilation system is necessary to maintain good air quality. ENERGY STAR sanctions three different ventilation options, including exhaust only, balanced ventilation and heat recovery.

Programmable thermostats automatically adjust your home's temperature settings, allowing you to save energy while you're away or sleeping. Through proper use of pre-programmed settings, a programmable thermostat can save you about \$150 every year in energy costs.



## Contest Home Example

In the contest winning home, the existing natural gas furnace and electric air conditioner had been installed in 1988. The 100,000 Btu furnace had a 70% efficiency rating at time of installation; the air conditioner was a 5 ton capacity rated at 8 SEER.

Global HVAC Distributors with Quality Comfort Systems Purifications replaced both with a high efficiency Ruud heat pump system that provides both heating and cooling. The system includes a 93% efficient sealed combustion natural gas furnace that will only operate when the outside air temperature falls below 40 degrees. By installing a sealed combustion unit, we eliminate the potential hazard of carbon monoxide being released into the house.

The new heat pump is efficiency-rated at 16 SEER which is twice as efficient as the air conditioner it replaced. Also, the new heat pump has a rated capacity of 2 tons as compared to the 5 ton air conditioner it replaced. This represents a reduction of 60% for cooling equipment size and 76% for heating system size from the existing equipment.

The heating and cooling ducts were pre-tested at 262 cfm50 leakage. The newly installed duct system was tested at 37 cfm50 leakage for an 85% reduction in air leakage. This will significantly improve the performance of the heating/cooling system.



Global HVAC Distributors and installation team from Quality Comfort Systems Purifications were able to reduce the system size required because of the building shell/envelope improvements we had installed in the house, including air sealing the building envelope, adding more insulation, and increasing the performance of the windows. By using smaller equipment, the house will be more comfortable while cutting the heating and cooling bill by about half. All the rooms were pressure balanced using relief grills to equal the pressure between the main part of the home and the bedrooms. This increases the performance of the heating/cooling system while making the home more comfortable.

In California, the average homeowner loses 20% to 40% efficiency due to a leaky duct distribution system. By sealing the ducts, the installation team increased the performance of the heating and cooling system, and made the house more comfortable and significantly less expensive to operate. The existing ducts in the contest winning home were covered in asbestos. They were completely removed by an asbestos mitigation company. The new duct system is a flex duct with R-8 insulation. The ducting was installed as straight as possible on the ceiling rafters and covered with cellulose insulation. This improves the performance of the heating and cooling system.

During the summer when the system was installed, the homeowners immediately noticed how much less their air conditioner was operating, and how much quieter the new system operated. Their lights used to flicker when the old air conditioner noisily came on. A home energy auditor from Anaheim Public Utilities had alerted the family that their duct system needed repair during a "walk through" visit shortly after they bought, but their Home Warranty service provider refused to pay for the improvements because of the presence of asbestos.

## How To Do Your Own Home Energy Makeover

The Anaheim energy makeover contest-winning home demonstrates how homeowners can significantly reduce their energy costs and improve home comfort and safety. You can do your own home energy makeover by participating in Anaheim Public Utilities' Home Investment Package (HIP) Program. The HIP program bundles various rebate offers into a one-stop shop designed to make homeowners sit up and take notice of the more than \$15,000 in savings they can realize through the program. These savings include a waiver of permit fees for energy-efficient improvements that can cost up to \$1,000, and up to \$14,000 in incentives. Plus, special low-cost financing is provided by the Electric & Gas Industries Association (EGIA).

For more information on Anaheim's Home Investment Package, please visit [www.anaheim.net](http://www.anaheim.net) and click on Public Utilities, then Home Investment Package.

## About The Contest

The Home Investment Package (HIP) Home Energy Makeover Contest was sponsored by Anaheim Public Utilities and the Electric & Gas Industries Association (EGIA) to demonstrate how homeowners can significantly reduce their energy costs and improve home comfort and safety. More than 500 Anaheim residents entered the contest, and twenty finalists were selected through an application screening process that identified those homes with the greatest potential to demonstrate energy savings. Contest sponsors donated the products and services featured.

For more than 100 years, Anaheim Public Utilities has served Anaheim water and electric customers with low rates and reliable service. Anaheim Public Utilities is Orange County's only publicly owned water and electric utility. The Electric & Gas Industries Association (EGIA) is a non-profit organization dedicated to advancing energy efficiency and renewable energy solutions through a nationwide network of contractors, distributors, manufacturers and utility companies.

To view a series of these fact sheets on other aspects of the Home Energy Makeover, go to [www.egia.org/anaheim](http://www.egia.org/anaheim)

## Sponsor Information

Global HVAC Distributors, Quality Comfort Systems Purifications and RUUD Are Proud Sponsors Of The Anaheim Home Energy Makeover Contest



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