



Consumer Guide to Home Heating and Cooling

Whether you are in the market for a new heating and cooling system or looking for ways to make your existing system more efficient, these guidelines can help you get the most out of your investment.

DETERMINING HVAC SIZE

The size of a heating or cooling system will determine its ability to heat or cool your home and the size of your energy bills. Oversized cooling systems can cost too much, provide inadequate comfort, and lead to mold and poor indoor air quality. A commonly used estimate that an HVAC unit should provide one ton of cooling for each 400 to 500 square feet of building area fails to take into account local climate and the efficiency of a house. One ton can condition 800 to 1,000 square feet of a very efficient house. Your contractor should use the Air Conditioning Contractors of America (ACCA) Manual J to calculate the proper size of HVAC equipment.

DID YOU KNOW?

To help increase your home's energy efficiency and lower your utility costs:

- Close the fireplace damper when not in use.
- Let in sunlight during cooler months season and use window treatments in warmer months.
- Keep air vents clean and unblocked.
- Air seal and insulate.



Buying a New System

If your heating or cooling system is over 15 years old, you can save on electric bills and improve your home's energy efficiency by investing in new equipment. System requirements will depend on the size of your house, amount of insulation, window performance rating, heating and cooling usage, and local climate. Look for systems with the ENERGY STAR® label that meet performance standards established by the U.S. Environmental Protection Agency. Some new systems incorporate "smart" home energy management features designed to manage and oversee your energy consumption.

Efficiency Ratings

Air conditioner efficiency measures how well a system cools a given space and the amount of electricity that is needed to do so. Two measures of air conditioner efficiency are the Seasonal Energy Efficiency Ratio (SEER) and the Energy Efficiency Ratio (EER). SEER equals the cooling output of a system divided by its overall power consumption during the normal cooling season (i.e., the warm part of the year). EER is similar except it measures the "instantaneous" efficiency rather than over an entire season. Window units use EER, while central air conditioning systems use both SEER and EER. The higher the SEER and EER ratings, the more energy-efficient the system.

Types of Heating & Cooling Systems

There are many different kinds of heating and cooling systems you can use in your house.

Central Air Conditioners. In 1992, the minimum SEER rating was established at 10. Since January 2006, all residential air conditioners sold in the United States must have a SEER of at least 13 in northern climates and 14 in the southwest and southeast. ENERGY STAR-qualified central air conditioners must have a SEER of at least 15. By upgrading from old SEER 10 to higher SEER ratings, you can significantly reduce your energy consumption by a significant percentage. For instance, if you are paying \$100 per month in direct cooling costs, you could reduce your monthly utility bill by up to \$35 by switching to the SEER 15-rated air conditioning system.

Room Air Conditioners. When buying a new room air conditioner, look for units with an EER of 10 or higher. Some units can connect to apps for remote operation and scheduled changes to temperature settings. The ENERGY STAR website, found in Further Reading, carries additional specifications.

Air Source Heat Pumps. Air source heat pumps combine heating and cooling capabilities. Look for ENERGY STAR-qualified heat pumps with a SEER of 15 or greater. Also consider how efficiently the heat pump functions during colder times of the year. The Heating Seasonal Performance Factor (HSPF) is the ratio of the total heat output of a heat pump during the normal heating season divided by the total energy consumed during that period. ENERGY STAR-qualified heat pumps have a HSPF of 8 or greater.

Furnaces. Furnaces usually heat your home with natural gas, oil, propane, or electricity. The Annual Fuel Utilization Efficiency (AFUE) measures the amount of heat actually delivered to your house compared to the amount of fuel supplied to the furnace. The higher the AFUE number, the more efficient the system. To earn the ENERGY STAR label, oil furnaces must have an AFUE of 85%; natural gas furnaces must achieve 90% in southern climates and 95% in northern climates; propane furnaces must achieve 97% in all climates.

System Maintenance

Following a regular maintenance schedule can help reduce your heating and cooling costs by 10% or more and will prolong the life of the equipment.

Invest in preventative checkups. Hire a professional HVAC technician to inspect systems for proper function. Air conditioners should be inspected in the spring and furnaces should be checked in the fall.

Consult the owner's manual. Your owner's manual should provide details on system maintenance and upkeep.

Clean or replace filters monthly during seasons of peak use. Cleaning and replacing filters will reduce heating and cooling bills while also extending the life of the equipment. Seal duct leaks.

Sealing ducts with fiberglass mesh and mastic can control humidity and dust. Many HVAC service companies will do this at a reasonable price.

Keep the area clean around outdoor air conditioners and heat pumps. Clear away weeds and debris so that air can circulate freely around the unit.

Check for disconnected or crushed duct work. Improperly connected or crushed duct work can restrict flow so that warmed or cooled air never reaches its intended destination.

Best Practices

You can save as much as 10% on heating and cooling costs by setting back your thermostat when you are not at home and while sleeping.

In winter, keep thermostats at the lowest comfortable temperature when you are awake and set it back further while you sleep. You can save 1% on heating bills for each 1° F you set it back during an eight-hour period. However, keep in mind your comfort level with temperatures set too low.

In summer, when you are not at home, keep your system running to avoid moisture build-up that could produce mold. Remember that restarting the unit will make it work harder and longer and waste energy. Setting your thermostat to the highest comfortable temperature will save energy and keep the indoor environment controlled. With a programmable thermostat, you can program the setting to return to a preferred temperature before you get home. And if you have pets in the home, keep their comfort in mind.

FURTHER READING

ENERGY STAR on Smart Home Energy Management Systems

energystar.gov/products/smart_home_energy_management_systems

ENERGY STAR on Air Source Heat Pumps

energystar.gov/productfinder/product/certified-central-heat-pumps/results

ENERGY STAR on Central Air Conditioners

energystar.gov/products/heating_cooling/air_conditioning_central

ENERGY STAR on Furnaces

energystar.gov/products/heating_cooling/furnaces

Financial Incentives

Tax credits, incentives, and rebates may be available in your area. Please visit energystar.gov/about/federal_tax_credits for more information.

FTC: Save Money on Heating and Cooling

consumer.ftc.gov/articles/how-save-money-heating-and-cooling-your-home