

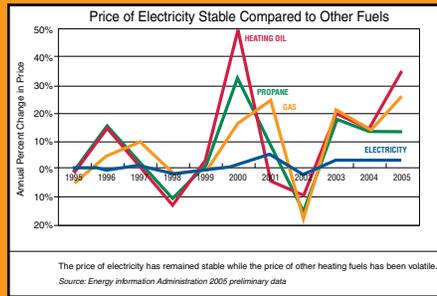
# HEAT PUMPS



SAVE MONEY WITH AN  
ENERGY-EFFICIENT HEAT PUMP



Whether you're replacing a furnace or water heater, choosing new appliances, or building a new home, how well you use energy has become an increasingly important factor in your decision. Making the right choice can mean big cost savings. But other factors are important too, like size, efficiency and reliability.



That's a lot of information to collect and digest, especially if you need to decide quickly. Wouldn't it be easier if there was someone you could go to for advice? Someone who knows all the options and won't try to sell you on just one?

That's when your local electric cooperative's Energy Advisor can help. As a member-owner of a Touchstone Energy® cooperative, you already have energy professionals who work for you. It's one of the benefits of ownership – being able to call on your employees for expertise. And because they're also your neighbors, they understand your needs and will give you honest, unbiased advice.

You have the power to control your energy costs. It's the power of human connections provided by the Energy Advisors at your local Touchstone Energy® cooperative. And it's there to help you make the best choices both for your family and your community.



### WHAT IS A HEAT PUMP?

It might not feel like it outside during the winter, but there is heat in the air and underground that you can use to warm your home. During the summer, heat can be removed from your home, using the same technology.

It's called a heat pump. Simply put, it's an electrically powered

device that moves heat from one place to another. Refrigerators and air conditioners are heat pumps – they move heat from colder interior spaces to warmer exterior spaces for the purpose of cooling. Central air conditioners look like heat pumps, but they work very differently.

In home systems, heat pumps can move the heat in both directions. They also can help keep more

money in your wallet by lowering your energy bills, because they are the most energy-efficient systems available today. There are two kinds of heat pumps that work in slightly different ways.

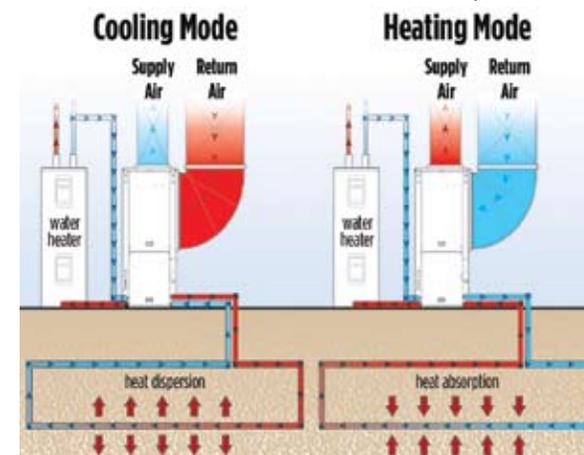


Illustration courtesy of WaterFurnace®

**AN AIR-TO-AIR OR “AIR-SOURCE” HEAT PUMP** is the most common type of heat pump. It moves heat from the air in one place to another, and can be as much as twice as efficient as an existing fossil-fuel (i.e., natural gas, propane, or fuel oil) home-heating system. This type of heat pump is most efficient when the weather outside is cool to moderately cold – around 25° Fahrenheit (F) or higher, although some systems can be efficient down to 0° F.

Heat from the air is absorbed by a low-temperature, low-pressure gaseous refrigerant. The gas passes through a compressor and is converted into a high-temperature, high-pressure vapor. Then, inside a pipe called a coil, the hot refrigerant transfers its heat to the indoor air and cools to a liquid state.

The warm air is circulated throughout your house. The liquid refrigerant goes back outside through another coil, where it becomes a vapor and starts collecting heat all over again.

For cooling, the process is reversed. The heat is removed from the air inside your home and pumped outside. The cool, now dehumidified, air is recirculated inside.



**A GEOTHERMAL, OR “GROUND-SOURCE” HEAT PUMP** uses the relatively constant underground temperature to extract or release heat. It’s the most efficient, inexpensive way to heat and cool your home because, just a few feet underground, is a free, clean and endlessly renewable source of heat.

The earth works like a solar battery, absorbing nearly half of the sun’s energy. The soil underground stays a relatively constant 50+° F year-round. That means it can provide a relatively constant, efficient source of heating and cooling.

In winter, a heat pump extracts the stored warmth from the earth through

Some geothermal systems also can preheat the water that goes into your water heater and cut the energy normally required to heat your water by as much as 50 percent. And for all of this heating and cooling, the only cost to you is the electricity to operate the system.

That’s why a geothermal system is 300 to 400 percent energy-efficient, returning \$3 to \$4 of heating, cooling and water heating for every \$1 of electricity it uses.



Illustration courtesy of WaterFurnace®

a liquid that is constantly circulated via a loop of buried pipes. The heat is distributed throughout your house through the duct system. In the summer, heat is taken from your house and released through the same loop of pipes into the soil. The loop, made of high-strength thermal plastic, is filled with an environmentally safe solution. The liquid never comes in direct contact with the earth and the loop is virtually maintenance-free, with a life-expectancy of more than 50 years. And with new trenching equipment, the loops can be buried even in rough terrain with minimal disruption to landscaping.

#### HOW ABOUT A HYBRID?

Both types of heat pumps also offer another benefit – they can be installed in homes with conventional fossil-fuel systems, such as gas, propane or oil-fired furnaces, and work hand-in-hand with the existing equipment. In these hybrid systems, the add-on electric heat pump works when the outside temperatures make it the most efficient. If the outside temperature dips too low, your furnace automatically takes over. And in the summer, the heat pump becomes a central air-conditioning unit.





**YOUR ELECTRIC COOPERATIVE IS A  
TOUCHSTONE ENERGY® COOPERATIVE.**

Touchstone Energy® is an alliance of more than 600 cooperatives in 46 states that offers reliable power, a strong local presence, and the expertise and resources of a nationwide network of energy professionals.

Your Touchstone Energy® electric cooperative is there for you when you have questions or need information. Call the Energy Advisor at your local cooperative to learn how you can use energy wisely and save money too!

