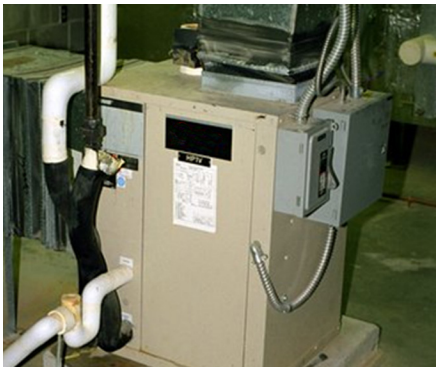
MyHomeWorks

Geothermal Heating and Cooling



Overview

Geothermal heating and cooling is an environmentally friendly approach to home climate control. After an initial investment, you're using the Earth itself – for free – to cool your home during the summer and warm it during the winter. And they use around 30 percent less energy than a standard heat pump!

How Do Geothermal Heat Pumps Work?

While air temperature in some climates can range from extremely hot in the summer to freezing cold in the winter, the temperature of the ground stays relatively constant (between 45 to 75 degrees Fahrenheit). This consistent ground temperature is what allows geothermal heat pumps to work and save homeowners a lot of money on their utility bills.

A geothermal heat pump is made up of two parts. Coils filled with water (or antifreeze) are buried underground outside of your home. In the winter, water circulates through these coils, collecting heat from the ground, which is naturally warmer than the cold winter air. The warmed water is then pumped into the indoor section of the system called the evaporator coil.

Refrigerant within the heat pump is used to extract heat from the warmed water running through the system's coils, and then that extracted heat is blown through ductwork to heat your entire home. Meanwhile, the circulating water, which has lost much of its heat, is pumped back outside to circulate through the exterior coils where it is warmed and the process continues.

In the summer, the process is reversed. Refrigerant extracts heat out of the air inside your home and deposits that heat into the water within the coils. The warmed water is then pumped outdoors where it cools underground and then recycles.

When Do Geothermal Systems Make Sense?

Geothermal systems have a large up-front investment and involve a lot of digging, so it usually makes sense to install one when doing a major remodel. Moreover, the quality of the ground under your home can make a big difference in how effective a geothermal system will be. Typically, 70 percent of the energy used by a geothermal heat pump comes from renewable energy stored within the ground, which is how you end up lowering your utility bills by 30 to 40 percent.

Much like installing traditional furnaces and air conditioners, it's important to think about a geothermal system as not just a coil in the ground, but as a system connected to a living space that may or may not be well air sealed and insulated. The smart approach to going geothermal is to work with an energy retrofit contractor who can help identify and address other efficiency problems.

 Photos courtesy of National Renewable Energy Laboratory