GOCHNAUER at HOME

A Higher Degree° of Comfort℠

Geothermal Heat Pumps: A Viable Option for Your Home

In today's housing market, there are a number of options for how you heat and cool your home. Geothermal heat pumps, although relatively unknown to the common market, could be a great option for you.

Heat pumps work by moving a refrigerant material from the outdoor unit, a condenser, and an inside unit, an evaporator coil, and back again, collecting and releasing heat as needed. Most heat pumps pull and circulate heat from the outside air to the inside air, which is subject to seasonal changes; not so with geothermal heat pumps.

Instead of using heat found in the outside air, geothermal heat pumps rely on the stable, even heat of the Earth to provide the heating, air conditioning and even hot water. While the air temperature around your home can fluctuate with the season, a few feet below the surface of the ground is another story. The ground remains a relatively constant temperature, varying slightly by latitude. For example, the ground beneath a Santa , California, home would average about 55 degrees Fahrenheit. By six feet underground, the temperature is usually constant, somewhere between 45 and 75 degrees Fahrenheit, depending just where one is located.

Geothermal heat pumps move heat from the Earth into your house during the winter, and in the summer they pull heat from the inside and discharge it into the ground. This method not only helps keep your home at a comfortable temperature, but it also makes wonderful use of the Earth's renewable energy. In fact, studies show that approximately 70% of the energy used in a geothermal heat pump system is renewable. The constant temperature of the Earth helps to make these heat pumps one of the most efficient and quiet heating and cooling technologies on the market today.

The installation of a geothermal heat pump for an average home is approximately $19,000 to $32,000 dollars when you factor in drilling costs and other installation expenses. While this is a high initial price, these specific heat pumps can produce significantly lower utility bills, usually between 30% and 40%, according to estimates from the U.S. EPA.

In addition to the overall energy savings that a geothermal heat pump provides, there are a number of other encouraging factors to consider. They are extremely durable and require very little maintenance. There are fewer mechanical components, most of which are underground, so they are sheltered from inclement weather. The underground piping is usually guaranteed to last between 25 and 50 years, and is virtually worry free. The components inside the house are small and easily accessible for maintenance. In addition, since there is no outside condensing unit like an air conditioner, geothermal heat pumps are much quieter to operate.

Geothermal heat pump systems also allow for a lot of flexibility, and can be installed in both new and retrofit situations. The hardware requires less space than conventional HVAC systems, and the equipment rooms can thusly be smaller in size. These heat pumps can also provide wonderful zone space conditioning, allowing you to determine which sections of your home need to be at a specific temperature range.

Since the shallow ground temperatures are relatively constant throughout much of the United States, a geothermal heat pump can be used effectively in just about any home. However, knowing the specific geological, hydrological and spatial characteristics of your property will help you and your contractor design a system that is perfect for you.

continued...

For more information, visit our website or give us a call at 717.299.3776 or email: Joel Moore or Ken K. Gochnauer
509 Rohrerstown Road, Lancaster, PA 17603 | 717.299.3776 | www.GochnauerAtHome.com | PA1180

GOCHNAUER at HOME
A Higher Degree° of Comfort℠

continued....Geothermal Heat Pumps: A Viable Option for Your Home

Things such as the composition and properties of the soil and bedrock will often dictate the rate of heat transfer, and therefore, will be an important consideration when designing a geothermal heat pump system. Soil and rocks with good heat transfer, such as clays, will mean that you can use less piping. The amount of soil also contributes to the system design. If the soil is too shallow to trench, a vertical system may be more efficient than a horizontal loop system.

Just like the soil and bedrock, the hydrology of the property also is an important factor in the design of a geothermal heat pump system. The water depth, volume and water quality can all play a part. Groundwater or surface water can be used as a source for both open and closed loop systems. If you make use of an open loop geothermal heat pump, you want to make sure you investigate your area's hydrogeology extensively. Doing so will help you avoid potential problems such as aquifer depletion and groundwater contamination. For additional information on what is considered good conditions for a geothermal heat pump, check out the Department of Energy's Energy Information Administration website: eia.doe.gov.

Of course, the amount of land, landscaping and the location of underground utilities will also contribute to your design. Horizontal ground loops, often seen as the most economical, are usually used for new construction with a great deal of available land. Vertical loop system designs are great for situations where there is an existing building, or where the landscaping shouldn't be disturbed.

If you're considering installing a geothermal heat pump in your home, remember that this can't be a do-it-yourself project. The technical knowledge, equipment and safety issues associated with the installation of such a system require a great deal of training, and it's best to let a professional handle the job. Once you have it installed though, you will see the savings in not only the bank, but also the environment.

For more information, visit our website or give us a call at 717.299.3776 or email: Joel Moore or Ken K. Gochnauer
509 Rohrerstown Road, Lancaster, PA 17603 | 717.299.3776 | www.GochnauerAtHome.com | PA1180