

ENERGYWISE

for your Home



A GSHP, also referred to as a geothermal heat pump, is an electrically powered heating and air conditioning system that uses the earth's ability to store heat in the ground. The GSHP system operates based on the stability of underground temperatures. The ground a few feet below the surface has a very stable temperature throughout the year, depending upon the location's annual climate. A GSHP system uses that available heat in the winter and puts heat back into the ground in the summer. A GSHP system differs from a conventional furnace or boiler by its ability to transfer or "pump" heat, versus the standard method of producing heat. As energy costs continue to rise and emissions become a concern, GSHP systems may hold a solution to address both of these concerns.



WHAT IS A GROUND SOURCE HEAT PUMP (GSHP) SYSTEM?

Types of GSHPs

There are four basic types of ground loop systems. Three of these—horizontal, vertical, and pond/lake—are closed-loop systems. The fourth type of system is the open-loop option. Which one of these is best depends on the climate, soil conditions, available land, and local installation costs at the site. All of these approaches can be used for residential applications.

CLOSED-LOOP SYSTEMS

Horizontal

This type of installation is generally most cost-effective for residential installations, particularly for new construction where sufficient land is available. It requires trenches at least four feet deep. The most common layouts either use two pipes, one buried at six feet, and the other at four feet, or two pipes placed side-by-side at five feet in the ground in a two-foot wide trench. The Slinky™ method of looping pipe allows more pipe in a shorter trench, which cuts down on installation costs and makes horizontal installation possible in areas it would not be with conventional horizontal applications.

Vertical

Large commercial buildings and schools often use vertical systems because the land area required for horizontal loops would be prohibitive. Vertical loops are also used where the soil is too shallow for trenching, and they minimize the disturbance to existing landscaping. For a vertical system, holes (approximately four inches in diameter) are drilled about 20 feet apart and 100–400 feet deep. Into these holes go two pipes that are connected at the bottom with a U-bend to form a loop. The vertical loops are connected with horizontal pipe (i.e., manifold), placed in trenches, and connected to the heat pump in the building.

Pond/Lake

If the site has an adequate water body, this may be the lowest cost option. A supply line pipe is run underground from the building to the water and coiled into circles at least eight feet under the surface to prevent freezing. The coils should only be placed in a water source that meets minimum volume, depth, and quality criteria.

OPEN-LOOP SYSTEM

This type of system uses well or surface body water as the heat exchange fluid that circulates directly through the GSHP system. Once it has circulated through the system, the water returns to the ground through the well, a recharge well, or surface discharge. This option is obviously practical only where there is an adequate supply of relatively clean water, and all local codes and regulations regarding groundwater discharge are met.

As energy costs rise and emission concerns continue, GSHP systems may hold a solution to both

GSHP systems provide maximum efficiency for your home.

- The most efficient residential heating and cooling systems available today
- Heating efficiencies 50% to 70% higher than other heating systems and cooling efficiencies 20% to 40% higher than available air conditioners
- Energy savings of 20% to 50% which results in recouping your investment in only a few years
- Can be a combination of heating/cooling and hot water heating system
- Some GSHP systems can save you up to 50% on your water-heating bill by preheating water
- Made of mechanical components that are either buried in the ground or located inside the home – no exposed equipment outdoors
- About the same size as a traditional heating/cooling unit
- Plastic tubing carries up to a 50-year warranty
- Very quiet, providing a pleasant environment inside and outside the home
- No open flame, flammable fuel or potentially dangerous fuel storage tanks

Who can participate?

To qualify for a GSHP rebate, you must be a member of SWCE and live in the cooperative's service territory.

What you'll receive

\$400 per ton or 12,000 BTUs.

Federal Tax Credit

Through December 31, 2016 homeowners who install ENERGY STAR qualified geothermal heat pumps are eligible for a 30% federal tax credit.

What you need to do

1. As a member of SWCE you are responsible for checking with your electric cooperative to verify funding availability and program parameters.
2. Request a GSHP Rebate Application from SWCE.
3. Complete the GSHP Rebate Application and include proof-of-purchase and documentation of efficiency ratings.
 - Installation must be complete before rebate will be issued
 - Itemized invoices from equipment vendors/installers must accompany rebate application
 - Invoices must itemize labor charges, quantity and price of the equipment installed
 - Invoices must include manufacturer and model numbers for the installed equipment
 - SWCE reserves the right to conduct inspections
 - Only new and complete ground source heat pump systems qualify

CONTACT US

To save energy and money, SWCE at 507-451-7340