

Ground Source Heat Pumps

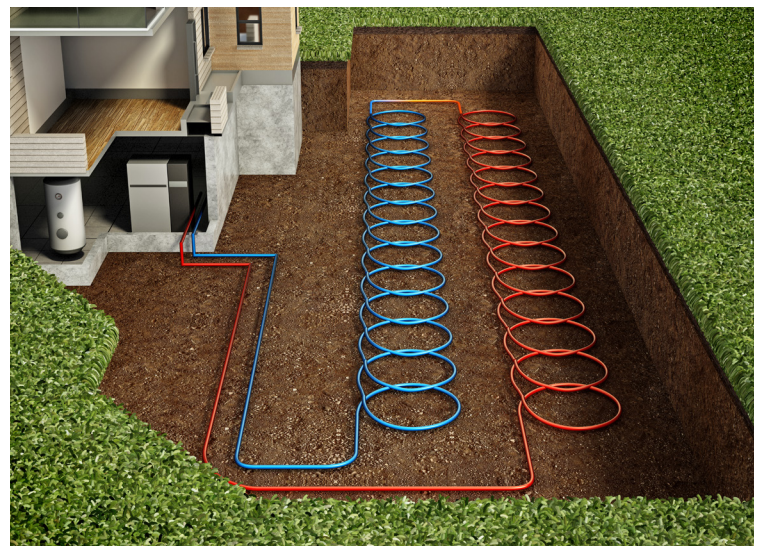
Ground Source Heat Pumps (GSHPs) are some of the most efficient and cost-effective technologies available to make a home comfortable in any season. By taking advantage of the earth's consistent temperature to supply space heating, cooling, as well as the option for hot water, GSHPs can use up to 72% less energy than standard electric resistance heating and standard air-conditioning¹. Compared to many other heating and cooling systems, they are also quieter, require minimal maintenance, and last longer with indoor components lasting up to 24 years and the buried ground loops lasting up to 50+ years².

By adding an additional component called a "Desuperheater," GSHPs can use excess heat pulled from the ground in the winter or rejected heat from the living space in the summer during cooling to heat household water, often at zero cost in the summer, and reducing water heating cost by about 50% in winter¹.

In colder regions, GSHPs can outperform most other heating and cooling systems because the ground temperatures at the level of the buried piping stay consistent at between 45-75 degrees F².

Systems typically consist of an indoor unit that replaces your furnace which is connected to a liquid-filled ground loop. Heat is pulled from the earth into the liquid in the ground loop in cold months and delivered to the living space, and heat is pulled from the home, cooling the space, and dumped back into the ground during the warm months. These ground loops can be buried in trenches just below the surface, or in deeper bore holes, depending on climate, soil composition, ground density, or availability of surface water. Things like the location of underground utilities, as well as the presence of extensive rock, and property size and shape can affect the design and installation of a ground source heat pump¹.

To learn more about Ground Source Heat Pumps and find a qualified installer, contact your local electric utility, the [International Ground Source Heat Pump Association](#), or the [Geothermal Exchange Organization](#).



Cost, Payback and Incentives

The total cost depends on the size and efficiency of the system, the cost of excavation, and the complexity of the installation.

The payback period for ground source heat pumps is typically 5–10 years³.

A utility incentive of up to \$3,500 may be available for GSHPs installed in certain regions; check with your local electric utility⁴. To receive an incentive, installers must be a licensed contractor, ISGSHPA certified, and should be experienced in installing GSHPs. Systems must be ENERGY STAR® certified and installed according to IGSHPA guidelines.

Federal tax credits and rebates of up to 50% may also be available.

Customer Benefits

- Reduces heating energy use up to 72% compared to electric resistance heating systems¹.
- Supplies both heating and cooling in one unit.
- Compatible with smart thermostats.
- Can be paired with Desuperheater to reduce water heating costs by up to 50% in the winter and up to 100% in the summer¹.

Recommended For

- Homes with land available for excavation for horizontal or vertical piping.
- Homes with existing ductwork.
- Homes with electric furnaces, particularly in cold climates.
- Homes with existing heating systems more than 15 years old.
- Homeowners who are looking to add air conditioning.

¹ Energy Saver: Choosing and Installing a Geothermal Heat Pump System

² Energy Saver: Geothermal Heat Pumps

³ U.S. Department of Energy: Guide to Geothermal Heat Pumps

⁴ BPA Energy Efficiency Implementation Manual

