



Geothermal

The Most Energy Efficient Systems Available



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Geothermal, ground source, geoexchange...perhaps you've heard some of this terminology tossed around when listening to the news or surfing the internet in relation to home improvements. But what is it, and how does it work?

Geothermal heat pump systems use the renewable energy available from the earth to provide heating in the winter and cooling in the summer. In the cooling mode, they utilize mild ground temperature to transfer excess heat from your home to the earth where it dissipates underground.

In the heating mode, the system transfers thermal energy from the ground into your home. An antifreeze solution is used as the heat transfer medium through a closed loop piping system buried in the ground below frost level. A pump and compressor located above ground (in your home's mechanical room) drive the system to circulate the solution in the loop. By using this stable thermal source (United States average temperature is 50° to 55° F), geothermal heat pumps provide energy efficient comfort year round without the need for a noisy outdoor unit and without burning any fossil fuel.

Additionally, your geothermal system has the ability to recover waste heat

from the compressor to supplement your hot water heater and significantly reduce the cost of heating your water. In order to do this, you need to add an optional piece of equipment called a hot water generator, or desuperheater, which can help provide domestic hot water needs at a fraction of the cost of electric or gas water heaters.

Environmentally Conscious

According to the US Environmental Protection Agency (EPA) geothermal systems are, "the most energy-efficient, environmentally clean and cost-effective space conditioning systems available today." Extremely high levels of efficiency are possible because

a geothermal heat pump only uses electricity to move heat, not produce it. Heating and cooling your home with a geothermal system can amount to

significant savings—25-50% on electric bills—when compared with traditional systems, as stated by the Geothermal Heat Pump Consortium (www.geoexchange.org).

Environmental advantages of geothermal systems have not only caught the eye of governmental agencies such as the Environmental Protection Agency (EPA) and the Department of Energy (DOE), the earth friendly equipment has warranted their endorsement. The Energy Policy Act of 2005 (EPACT), signed by President Bush on August 8, 2005, offers consumers federal tax credits

for purchasing energy-efficient appliances and products. Most geothermal systems (must include hot water generator) will apply for the full \$300 credit

Benefits of a Geothermal System

- Highest efficiency of any system
- No outdoor equipment
- All electric (no flue, fumes, combustion)
- 20+ years average life expectancy
- Low maintenance costs
- Quiet operation
- Clean operation
- Environmentally responsible
- Can also provide domestic hot water



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available. In order to take advantage of this tax credit, your new geothermal system must be installed by December 31, 2007. For more information on qualifying equipment visit www.energy.gov/taxbreaks.htm.

Home Comfort

Geothermal systems are popular due to the low operating costs and environmentally responsible operation. Comfort is an advantage that is often overlooked.

In heating, geothermal heat pumps provide warmer air temperatures (typically 95°-105° F) than conventional air source heat pumps (typically 85°-95° F). Geothermal systems move warm air at slightly higher volumes and hence evenly saturate a home with warm air, providing a very comfortable heating system.

Aesthetically, geothermal systems are the best choice. With no outdoor unit, you not only eliminate the noise of the unit kicking off and on, but you don't have to look at it or try to disguise it with landscaping.

To learn more about how a geothermal system can lead to cost savings and greater overall comfort in your home, please call 717.625.1500 for an in-home consultation with your Haller comfort consultant.

geothermal

frequently asked questions

Does the system take up the same amount of space inside?

A geothermal unit is very similar in size to the furnace or air handler unit that you probably already have in your mechanical room, plus, there is no outdoor unit.

Can my existing ductwork be used?

An evaluation of your home is necessary for proper sizing, but if ductwork was sized correctly for your original heating/cooling system, it should be reusable for a geothermal system.

How is the noise level in comparison to my current system?

As far as sound level is concerned, the indoor unit is not any different than the fan on a standard furnace or air handler fan, but overall the system will seem to be quieter because there is no outdoor unit to hear when in the cooling mode.

Will the piping fit on my property and how disruptive will the installation be?

The continuous loop of sealed pipes can be hidden under your lawn, garden or even your driveway, buried vertically (most common) or horizontally. Disturbance to your existing landscaping is minimal. Loop boreholes (or trenches) are refilled as part of the installation process and can be quickly replanted. Once the ground loop is installed, you can typically forget about it. (See p. 27 for illustration.)

What is the cost difference?

Initial installation of a geothermal system can cost nearly twice as much as a standard heat pump system (half of this can be from the underground loop), but with

continued on page 25.

Did you know?

Today there are more than 1 million residential geothermal installations in the U.S. The current use of geothermal heat pump technology is equivalent to taking more than 1.29 million cars off the road, or planting more than 384 million trees.



A Haller Comfort Consultant reviews with the homeowner the operations of a newly installed ClimateMaster geothermal system.

Estimated Operating Cost Summary

System	Heating Cost	Cooling Cost	Hot Water Cost	Total Cost	Cost Per Month
Geothermal	\$381	\$118	\$398	\$897	\$75
14 SEER Heat Pump	\$691	\$226	\$555	\$1,472	\$123
Natural Gas 92% Condensing 2-stage furnace w/14 SEER Air Conditioner	\$999	\$227	\$506	\$1,733	\$144
Propane 92% Condensing 2-stage furnace w/14 SEER Air Conditioner	\$1,093	\$227	\$557	\$1,878	\$156
Oil 82% Natural Draft furnace w/14 SEER Air Conditioner	\$1,432	\$227	\$597	\$2,256	\$188

*Estimates based on 2,400 square foot home located in Central PA. Estimates do not include domestic energy usage. Due to the variability of weather, system installation and living habits, this analysis is to be considered an estimate only. Estimate courtesy of ClimateMaster® geothermal systems.

Utility rates used in the above estimates: Electric - \$.093/kwh; Natural Gas - \$1.49/therm; Propane - \$1.50/gallon; Fuel Oil - \$2.20/gallon.



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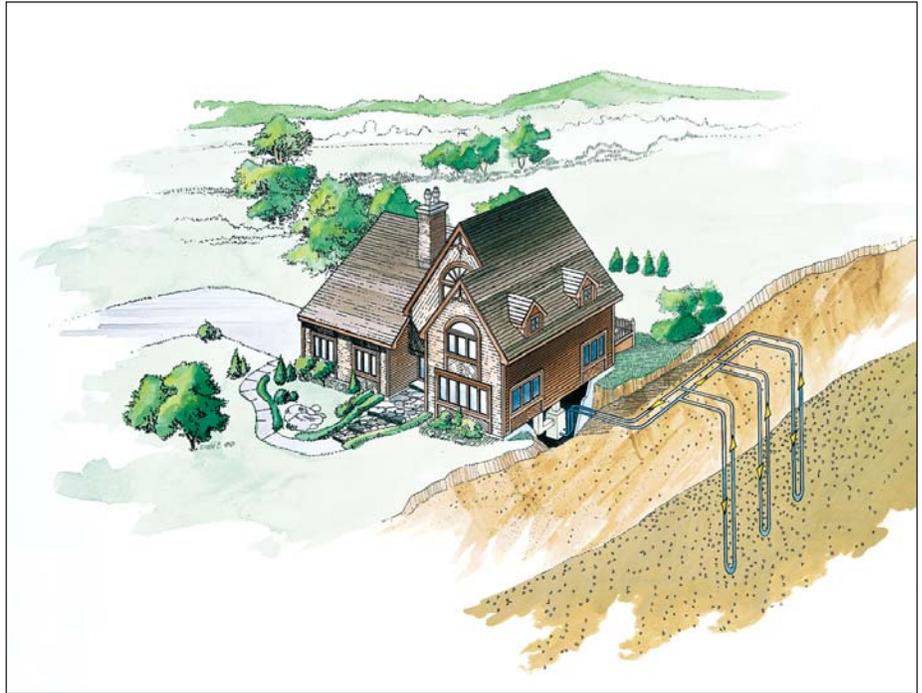
frequently asked questions

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expected savings on year-round utility bills, the payback time can be as short as 2 years. Geothermal's payback is constant and ongoing, but the upfront cost difference has been the main stumbling block for wide acceptance of the technology.

What kind of maintenance is required?

Routine maintenance consists of changing your air filters on a regular basis. There is no furnace or chimney to clean, but as with any heating/cooling system, you should look to a professional to perform annual maintenance on the equipment. Haller offers a Preferred Customer Program (PCP) Maintenance Agreement that includes a regular cleaning and inspection to help achieve peak performance and



This is an illustration of the loop installation – Haller most often uses this vertical closed loop in remodeling projects.

detect minor problems before they can escalate into major emergencies. (In addition, with a current PCP, you'll re-

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