

Heating and
air conditioning
systems

GeoThermal

Bringing *comfort* to your world



ALLIANT ENERGY.

We're on for you.



GeoThermal

Welcome to the new era of home comfort—otherwise known as GeoThermal heating and cooling. While the name may sound space-age, the technology is very, well, down-to-earth. Read on to find out more about how you can heat and cool your home using the natural heat-storing ability of the earth—and significantly lower your energy costs!



How does it work?

A geothermal heating and cooling system, sometimes called a ground-source heat pump, works on a simple premise: the earth below a certain depth (the “frost line” – usually about four feet) is a constant temperature of about 50 degrees year-round. Heat can be taken from the ground and transferred to the air in your home during the winter. Heat can also be transferred back into the ground during summer to cool your home.

The basic elements of the system include:

- Buried loops of piping (the ground loop);
- A biodegradable liquid antifreeze;
- A pump module to circulate the antifreeze; and
- A heat pump.

The loops of piping are buried in the ground, either vertically or horizontally (more about that later), and are connected to the circulating pump inside your home. The pump module circulates a mixture of water and biodegradable antifreeze through the buried pipe loops, and the liquid mixture absorbs heat from the ground as it flows through the loop. The heat pump takes heat from the liquid mixture and transfers it to the air, which is circulated in your home. To cool your home in the summer, the system simply works in reverse.

What are the benefits?

Because the heat pump is self-contained and installed indoors, geothermal systems have low maintenance and are very reliable; most are warranted for up to 25 years. And there's more:

- The ground loop piping is designed for very long life, and some manufacturers warrant their piping for fifty (50) years.
- The ground loops are joined by thermal fusion (melting them together), so there's virtually no chance of the liquid leaking out.
- There are no noisy "on" cycles with blasts of hot or cold air, and there are no fluctuations in temperature.
- There are no flues or chimneys and no carbon monoxide concerns.
- There are no unsightly or noisy outdoor (condenser) units.

Safe, reliable and easy to maintain – what more could a homeowner want?

How about lower energy bills? Heat from the ground is free, and the only electricity needed is for moving that heat between your home and the ground. According to the Geothermal Heat Pump Consortium, a geothermal system can lower your heating bills up to 50 percent and lower your cooling bills up to 30 percent. This could mean a payback in as little as two to seven years! And don't forget: ground-source heat is naturally renewable and friendly to the environment.

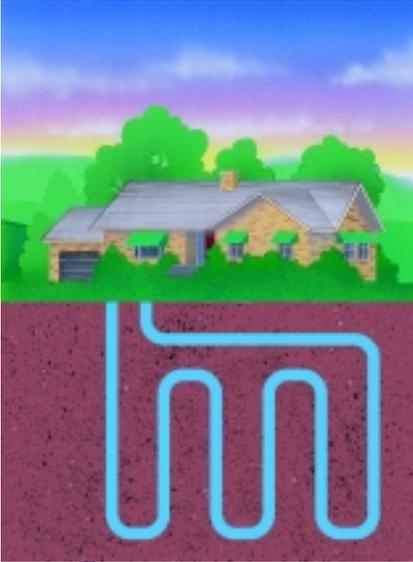


And for extra energy savings, you can add an attachment (called a “desuperheater”) that connects your heat pump to your water heater. When the energy from the heat pump isn’t needed, it’s diverted to your water heater. For most of the summer, you’ll be getting virtually free hot water!

You may be wondering how a geothermal system handles below-zero temperatures. The geothermal system in your home is specifically designed to account for the climate and your home’s heating load, but an extended bout of extreme cold could lower its efficiency. Most geothermal systems installed in the northern states have an auxiliary electric heater as a backup; many homeowners find the auxiliary unit will take over for a few hours to give the main system a chance to “catch up” during frigid weather. And as with any home heating/cooling system, adequate insulation and overall weatherization are key factors in lowering energy consumption.

Vertical or Horizontal?

The loops of plastic piping can be installed either vertically or horizontally, depending on the size and shape of your yard, the amount of existing landscaping, and soil conditions. The amount of piping needed depends on the size of your home and the loop configuration. Your contractor or builder can advise you which option is better for your home.



To install a vertical loop:

a (bore) hole about four inches in diameter is drilled near your home. The depth of the hole is usually between 50 and 200 feet, depending on what the contractor encounters along the way. Two U-shaped loops of pipe are inserted into the hole, followed by a special sealing material (grout).



For a horizontal loop:

the contractor will excavate a trench about three feet wide and between four and six feet deep. There are a variety of techniques for placing the piping in the ground: some contractors roll it “slinky-style,” then tie the coils together; others might loop the pipe back over itself, covering each length with soil.

More information

If you'd like to learn more about using geothermal energy in your home, talk to an Alliant Energy representative by calling one of the toll-free telephone numbers below, or visit our Web site at www.alliantgeo.com.

If you're a customer of

Alliant Energy

call 1-800-822-4348

If you're a customer of

Alliant Energy-Interstate Power Company

call 1-877-881-2582 in Iowa

call 1-800-331-2371 in Minnesota

If you're a customer of

Alliant Energy-Wisconsin Power and Light

call 1-800-862-6222

GeoThermal Information Office

call 1-800-259-7398

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the Alliant Energy mobile
geothermal educational vehicle**



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