A Ground-Source Heat Pump is a central heating and cooling system that functions by pumping heat to or from the ground. Capable of saving homeowners up to 70% on energy costs associated with heating and cooling, it’s the ultimate in home comfort efficiency. As put by The U.S. Department of Energy, it’s “the most cost-effective, energy-efficient and environmentally friendly method of heating and cooling your home available today.”

Saving up to 70% on home heating and cooling goes a long way — especially considering it’s responsible for more than half of the total energy consumed by a typical household.

In short, a Ground-Source Heat Pump is a virtually maintenance-free system that works with the world instead of against it. And since it’s environmentally friendly and can considerably reduce your utility bills for many years to come, it’s great for the future in more ways than one.

**How it Works**

Outdoor temperatures rise and fall, but thanks to energy provided by the sun, the temperature 4 feet to 10 feet underground is around 50°F all year. Ground-Source Heat Pumps tap into the “free energy” potential this consistent temperature creates with a network of underground plastic piping called a “loop.”

To warm a home, a non-toxic antifreeze solution circulates throughout the loop while absorbing heat from the ground. This heat is then directed to the indoor components of the unit, which compresses the heat to a higher temperature and distributes it throughout the home.

When the home needs to be cooled, the process is reversed. The liquid solution absorbs the heat within the home and transfers it underground where it’s dispersed into the cool earth. The entire system and its materials are proven, reliable and safe. In fact, they’re saving homeowners energy and money in all 50 states and around the world at this very moment.

Ground-Source Heat Pumps are unlike ordinary heating systems in that they don’t burn fossil fuels or generate heat. They simply transfer heat to and from the earth while using only small amounts of electricity to operate the unit’s fan, pump and compressor.

Setting a Ground-Source Heat Pump to heat or cool can be done from the thermostat.

**The Major Pieces**

There are three main components of a Ground-Source Heat Pump. The indoor unit, which houses the heat exchanger, compressor and fan, the underground loop and the ductwork.

A Ground-Source Heat Pump will most likely function properly with your current ductwork.

**Loop Variations**

A closed loop system is composed of a network of plastic piping that is buried in the ground and connected to the Ground-Source Heat Pump. A water and antifreeze mixture circulates through the closed loop system where it absorbs heat from the air (in the heating mode) or rejects heat to the earth (in the cooling mode). The closed loop can be installed either horizontally in trenches six to eight feet deep, or vertically, in bored holes spaced 12–15 feet apart and approximately 200 feet deep.

As a point of reference, a well insulated 2,000-square-foot home might need a four-ton Ground-Source Heat Pump system and a horizontal closed loop with approximately 3,000 feet of plastic piping, or a vertical closed loop of four bore holes with approximately 1,600 feet of plastic piping.

**Call a Pro**

Accredited contractors can find the right equipment for your needs and they can provide proper installation. To find contractors near you, contact your electric cooperative or the Minnesota Geothermal Heat Pump Association

minnesotageothermalheatpumpassociation.com