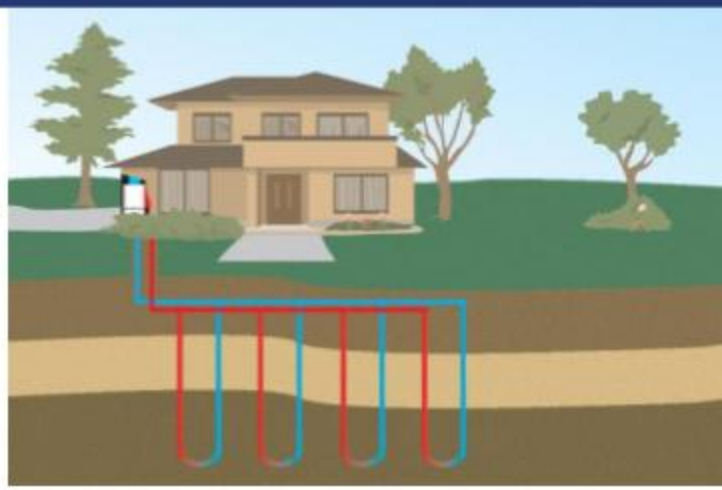
# Ground Source Heat Pumps (GSHPs)

## Ground Source Heat Pump Highlights:

- **Proven technology** - Just ask your refrigerator if it works!
- **Energy efficient** - For every unit of electricity they use, an GSHP brings 3.5 to 4.5 units of heating energy into your home. This is possible because the electricity powers a refrigeration cycle that captures and transfers more heat from the ground than the energy it takes to run the heat pump.
- **Cost effective** - Because of their super energy efficiency, GSHPs are inexpensive to operate.
- **Adaptable** - GSHP can replace both furnaces and boilers and can often make use of the pre-existing heat distribution system within the home.
- **Reliable** - Six to eight feet below the surface, the ground remains at a relatively constant ~50-55°F in Upstate NY, making a very stable energy efficiency and capacity.
- **Air Conditioning** - When replacing a furnace they give efficient, effective air conditioning too for no extra cost. GSHP interfacing with hydronic delivery need to have fan coils installed to allow air conditioning without unwanted condensation.
- **Whole home solution** - They can supply 100% of the heating needed in Central NY's coldest winter days. They can also supply your hot water!
- **Combustion Free** - Because nothing is burned in the home, heat pumps heat and cool while giving you the cleanest and healthiest air to breath.
- **Climate Friendly** - GSHP can be run using renewable electricity, and you are on the way to carbon neutral home heating and cooling!



## Can I afford a GSHP?

- **26% Federal tax credit** for 2020 (must owe taxes to take advantage of this incentive)
- **New NYSEG rebate** of $1,500/10,000 Btuh system (that's $3750-$9000 for a typical home)

**Together, these cover almost half of the cost and even large systems may then be $20,000 or less.**

**Can't decide? Let HeatSmart be your guide!**

## Components of a GSHP system:

- A ground loop field is located outside & underground and can either be drilled vertically or trenched horizontally. Then, a water solution with antifreeze circulates in a closed loop between the ground and the heat-pump station. This solution picks up heat from the ground and enters the house at its warmest. The heat pump extracts heat from the circulating fluid of the loop field and then releases it to either an air or radiator-based delivery system to the rest of the house. The now cold water returns to the loop field to be warmed back up to soil temperature.
- The heat pump compressor/exchanger is typically located in a basement. It might measure 3' wide by 6' feet tall, similar to a conventional furnace. It interfaces with the loop field at one end and the heat delivery system (forced air ducts at top in the figure to the left) at the other.
- Thermostat/Remote control- can be wall-mounted like conventional systems & programmed by remote control.
- System life approximates 25 years for the indoor compressor and 50-100 years for the underground loop field.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