



Ground source heat pumps (GSHP) transfer heat from the ground into a building to provide space heating and in some cases, to pre-heat domestic water.

There are three important elements to a GSHP:

- 1) **The Ground Loop.** This is comprised of lengths of pipe buried in the ground, either in a borehole or a horizontal trench. The pipe is usually a closed circuit and is filled with a mixture of water and antifreeze, which is pumped around the pipe absorbing heat from the ground.
- 2) **A Heat Pump.** This has three main parts:
 - The evaporator - (e.g. the squiggly thing in the cold part of your fridge) takes the heat from the water in the ground loop;
 - The compressor - (this is what makes the noise in a fridge) moves the refrigerant around the heat pump and compresses the gaseous refrigerant to the temperature needed for the heat distribution circuit;
 - The condenser - (the hot part at the back of your fridge) gives up heat to a hot water tank which feeds the distribution system.
- 3) **Heat Distribution System.** Consisting of under floor heating or radiators for space heating and in some cases water storage for hot water supply.

There are three options available for ground source heat pumps they are;

- Borehole
- Straight horizontal - trench costs less than a borehole, but needs more land area;
- Spiral horizontal (or 'slinky coil') - needs a trench of about 10m length to provide about 1kW of heating load.