



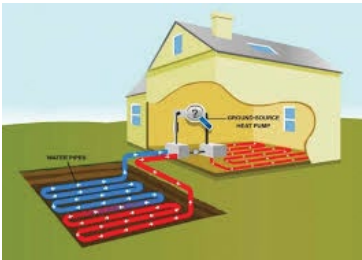
Ground Source Heat Pump

The ground acts as a very large store of heat energy and a heat pump is able to extract this energy. A ground source heat pump can be used to extract heat energy from the ground, and transfer the heat into your home.

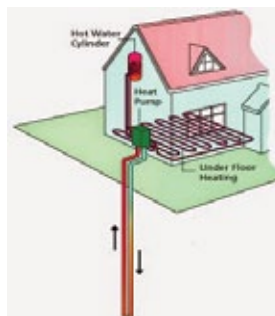
This heat is extracted by fluid inside a loop of pipe slowly being pumped around the loop into the heat pump.

Types of System ▶

Ground Loops are normally laid flat or coiled in trenches about 2 metres deep. The length of the ground loops depends on the size of your home and the amount of heat you need. Longer loops can draw more heat from the ground, but need more space to be buried in.



Vertical Borehole - If there is limited space, a vertical borehole can be drilled instead and a vertical loop is installed down into the ground. A depth of up to 200 metres is typical for a domestic installation.



Geothermal Radial Drilling - A relatively new system which allows for sustainable heat extraction from a wider ground source is the Geothermal Radial Drilling system. Radial drilling draws its heat by spacing bores at varying angles ensuring that the highest possible ratio of watts per metre is achieved.



Is a ground source heat pump suitable for me? ▶

▶ **Is your garden suitable for a ground source heat pump?**

You will require 200m-300m of trenching to lay the pipe work in to supply enough heat for a 4 bedroom property, and the ground needs to be suitable for digging the trench or borehole. Accessibility is also important, as the machinery needed to dig the trench or borehole will need to access the area concerned.

▶ **Is your home well insulated?**

Since ground source heat pumps work best when producing heat at a lower temperature than traditional boilers, its essential that your home is well insulated and draught-proofed well for the heating system to be effective

▶ **What fuel will you be replacing?**

The system will pay for itself much more quickly if it is replacing an oil, electricity or coal heating system. Heat pumps may not be the best option for homes using mains gas.

▶ **What type of heating system will you use?**

Ground source heat pumps perform better with under floor heating than with radiator-based systems because of the lower water temperatures required.

▶ **Is the system intended for a new development?**

Combining the installation with other building work can reduce the cost of installing the system.

Solar PV
Solar Thermal
Biomass Boilers
Ground Source Heat Pumps
Air Source Heat Pumps

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Case Study

Steibel Eltron WPF14 Ground Source Heat Pump ▶



This Steibel Eltron WPF14 Ground Source Heat Pump unit was completed by ESP energy in January 2016 for an existing customer.

ESP previously visited this site to install a 50 kW Solar PV system on a shed roof in 2014.

The customer decided to expand his renewable technology system by linking his PV system to a new GSHP. This would enable his house to be more self sufficient, using any excess electricity produced by his 50kW PV panels.

After assessing the ground around the property for suitability and space, it was decided that a large paddock to the side of the property was the best place and digging commenced. The ground workers started on the trenches. Three trenches 100metres long and 1m wide and 1.2m deep were dug allowing for 600m of ground loop pipe to be laid. This pipework entered a chamber with a manifold inside allowing the three loops to merge into a single set of pipes which then entered the house.

Our engineers then installed the heat pump in a utility room along with a 200 litre buffer cylinder and 300 litre DHW cylinder.

The pipe work was then connected to the heating system to create a new heating circuit complete with pump and DHW supply.

The property had underfloor heating installed by ESP Energy and radiators upstairs. Each room has its own thermostat allowing different zones in the property to have different temperatures.

Once completed the installation was checked to ensure compliance with the building regulations and to qualify with the Renewable Heat Incentive.

The customer is now benefitting from a more cost effective heating system and receiving regular payments from the government incentive scheme.

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