Ground source heat pumps

Drawing as much as 75% of the energy needed by the heating system from freely available, inexhaustible solar energy stored in the ground, Dimplex ground source heat pumps are available in an extensive range of models types and capacities suitable for either domestic or commercial applications.

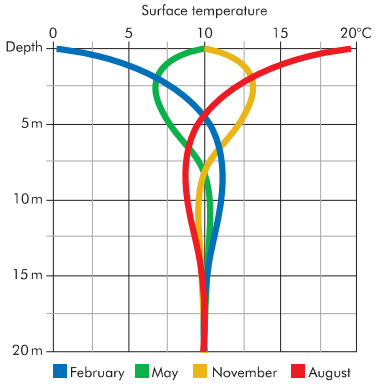
Due to highly stable temperatures below the earth's surface, ground source heat pumps provide high levels of efficiency for space and water heating all year round.

Benefits of the ground as a heat source

- Consistent temperatures below ground throughout the year provides a high Co-efficient of Performance.
- Can be used for heating, domestic hot water and swimming pools.
- Borehole systems can be used for either passive or active cooling (see page 36).

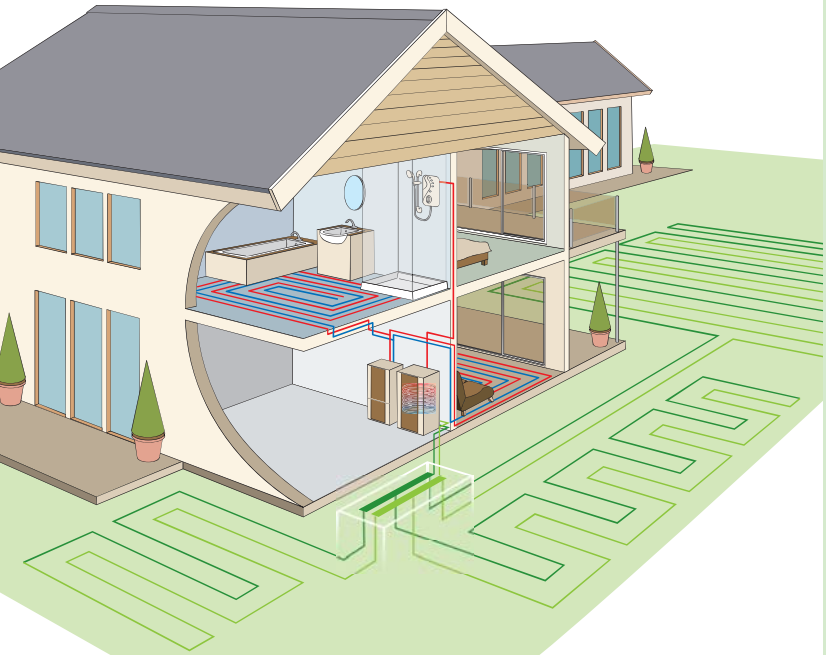
At just 1m below the surface, the earth provides a stable source of heat throughout the year.

At depths of 15m or more, the earth provides a constant 10°C temperature.



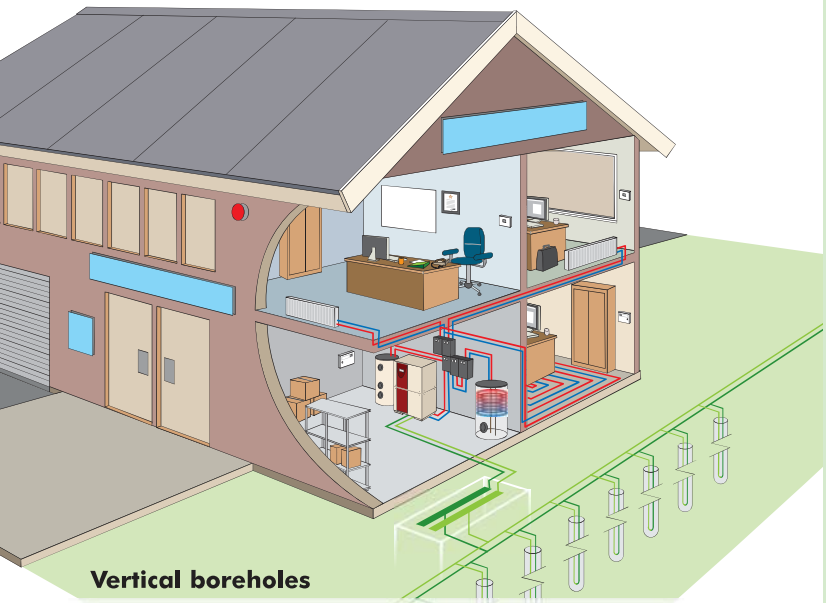
Heat from the ground

The earth stores an enormous amount of solar energy from both solar radiation and rainfall. To extract this energy, ground collectors consisting of flexible poly ethylene pipes are buried in the earth, either horizontally or vertically. A mixture of water and anti-freeze is then circulated through the pipe loops, attracting the heat energy and transferring it to the heat pump.



Horizontal ground collectors

If a large enough land area is available, horizontal ground collectors provide an effective method of extracting heat from the ground.
The pipework is buried at a depth of approximately 1.2m and spaced 0.75m apart. The land area required is dependent on both the capacity of the heat pump and heat conductance of the soil type in which the pipes are buried.
As a space saving alternative to horizontal collectors, slinkies - consisting of coiled pipes buried in a trench – can be used.



Vertical boreholes

If land space is limited the ground collectors can be installed vertically in a borehole, drilled up to 100m deep in the ground.
Multiple boreholes are commonly used in large installations where very high levels of heat extraction are required.

CASE STUDIES

Heat pumps in action

Dimplex heat pumps have been installed in a wide variety of applications – two are featured here, but more are available on our website.

Housing Association bungalows convert to Dimplex

Stafford & Rural housing association has fitted Dimplex ground source heat pumps into a refurbishment project of nine warden-linked bungalows at Synnerton, Staffordshire, with five of the properties taking part in a year-long survey by the EST to monitor heat pumps in real-life installations.

One of the key considerations when replacing the system was fuel poverty as economic heating was very important to its tenants. The housing association was also looking for something that was future-proof, cost effective with no costly bills or annual inspections. Three suppliers were considered by an assessment panel which included 3 tenants with Dimplex selected because of the overall package they could supply.

Top Marks for Dimplex in London school

Ealing council has installed Dimplex ground source heat pumps at three schools and is already planning a fourth!

A Dimplex SIH 40 TE high temperature ground source heat pump was initially installed at Grange Primary School, a larger than average school with 500 pupils, with 15 boreholes required in a restricted area which subsequently became part of the playground.

Following the success at Grange Primary, a Dimplex SI 37 TE heat pump has been installed at Mandeville School, Northolt, a co-educational day school for pupils aged 2-12 and a SI 24 TE has been installed at Ellen Wilkinson School for Girls in Acton, with 1400 students aged 11-18.