

Ground Source Heat Pumps (GSHP)

Ground source heat pumps (GSHP) transfer low-temperature heat from the ground into the home to provide space heating and in some cases, to pre-heat domestic hot water. Beneath the surface, the ground stays at a fairly constant temperature, so a ground source heat pump can be used throughout the year.

GSHP needs electricity to run, but it should use less electrical energy than the heat it produces.

A GSHP system comprises a ground loop and a heat pump at ground level. The ground loop is a network of pipes sunk in a borehole or buried in a straight or horizontal ('slinky coil') trench. It is a closed circuit and filled with a mixture of water and antifreeze, which is pumped round the pipe absorbing heat from the ground. The heat pump raises the temperature (through a process of evaporation, compression and condensation) for supplying a heating system.

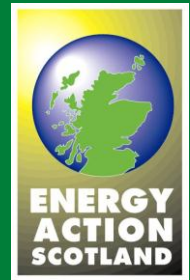
The heat produced by GSHP is at a lower temperature than other forms of heating – making it best suited to underfloor heating, which requires lower temperatures, rather than radiators (or, if radiators are used, they should be properly-sized). Those installing GSHP need to consider whether a back-up system will also be required.

GSHPs differ in size and complexity, so cost and payback are difficult to specify. Payback is also influenced by: efficiency of the system; the type of system being replaced by GSHP; energy efficiency of the home; whether GSHP is also being used for heating the domestic hot water supply.

The efficiency of a GSHP system is measured by the Coefficient of Performance (CoP). This is the ratio of units of heat output for each unit of electricity used to drive the compressor and pump for the ground loop. Typically, for every unit of electricity used to pump the heat, 3 to 4 units of heat are produced.

In addition to planning requirements, consideration needs to be given to the area and type of land and access for machinery.

The Energy Saving Trust has just completed field trials of ground and air source heat pumps, in order to get a better idea of how they perform and the savings they achieve in real life environments. Read the final report 'Getting warmer: a field trial of heat pumps' on their website at www.energysavingtrust.org.uk



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