

FACT SHEET:

GROUND SOURCE HEAT PUMPS (GSHP)

What are they?

A [ground source heat pump](#) is a box about the size of a domestic refrigerator, connected to several lengths of pipe buried underground.

What do they do?

They provide heating and hot water which can be used domestically for showers, under-floor heating, radiators etc. and require a lot less energy than a conventional electric boiler. While an electric boiler heater will supply one unit of heat for every one unit of electricity, a heat pump will supply 3-4 units of heat for one unit of electricity.

How do they work?

Heat from the ground is absorbed at low temperatures into a fluid inside a loop of pipe (a ground loop) buried underground. The fluid then passes through a compressor that raises it to a higher temperature, which can then heat water for the heating and hot water circuits of the house.

The cooled ground-loop fluid passes back into the ground where it absorbs further energy from the ground in a continuous process as long as heating is required.

If there is enough space, the collector loop can be laid horizontally in a trench about a metre or so below ground. Some installations will be eligible for the [Renewable Heat Incentive \(RHI\)](#).

Where do they go?

The heat pump itself will go indoors, while



the pipe system will be buried a metre or so underground. The underground pipe system will need a relatively large area in order to collect enough energy.

What should be considered?

Ground source heat pumps require a large area in which to install the pipe loops and come in varying sizes. Typical ground areas required for trench systems are approx. 400m² for a 4-5 bedroom detached house to approx. 500m² for a 5-6 bedroom detached house.

New-Build Regulations & Heat Pumps

During the design process, an early SAP calculation can be undertaken which could outline the need for a ground source heat pump to demonstrate compliance with building regulations, especially if the property is built in an off-gas grid area.

What are the planning requirements?

Permitted development rights allow for ground source heat pumps to be installed without the need for planning permission, providing certain conditions are met. We would recommend checking with your local authority for further advice on planning.