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How to heat your home using the earth's natural heat (and a little electricity)

A Ground Source Heat Pump makes use of the natural renewable energy that is stored in the earth, even in winter, to heat your home. Installing one allows you to heat your home using a lot less energy than traditional methods. Because it is so energy efficient, your home will be responsible for producing a lot less of the carbon dioxide that causes Global Warming. The following article tells you more, and what to look out for when considering a Ground Source Heat Pump.

Did you know that in northern countries like the UK, the earth just a few feet below the surface keeps a constant temperature of between 11 and 12 degrees Centigrade, even in winter? It traps the heat of the sun, and stores it underground, all year round. A Ground Source Heat Pump transfers this heat to your home to provide space-heating. Using a compressor (a bit like the one in your fridge), it increases this heat to around 45 or 50 degrees, and transfers it to radiators or under floor heating. The heat can also be used to pre-heat your hot water, meaning you need less gas or electricity for this also.

Because they make use of the renewable energy stored in the ground, Ground Source Heat Pumps provide one of the most energy-efficient ways of heating buildings. The only energy used by Ground Source Heat Pump systems is the electricity to power the pump. Normally a system will deliver 3 or 4 times as much thermal energy (or heat) as the electrical energy used to drive the system. If you can source your electricity from a renewable source such as wind or solar, then your heating will be completely clean and non-polluting.

Ground Source Heat Pumps have been widely used for many years in both Europe and North America. There are now several hundred thousand in operation. In Switzerland over 80,000 systems are installed each year. They typically cost more to install than conventional heating systems. In the UK you should currently expect to pay around £8,000 (plus VAT) or more to heat a medium-sized house, although government grants can refund some of this cost (up to £1,200 is available in England and £4,000 in Scotland). However, Heat Pumps have very low maintenance costs, and can be expected to provide reliable and environmentally-friendly heating for over 20 years.

In a modern, well insulated house, a Ground Source Heat Pump system can also save you money on running costs. It is likely to be cheaper to run than an oil-fired boiler, and less than a third of the running cost of electric heating. Currently it is



likely to be just a little bit cheaper than the very best of the modern condensing gas boilers, but gas prices may well rise in the future in many countries.

There are 3 main elements to a Ground Source Heat Pump system. The first is the 'ground loop' which is a length of pipe buried in the ground, either in a borehole or a horizontal trench. For a modern detached house you will typically need two trenches about 40 to 50 metres long to supply enough heat for the house. The ground loop collects the heat from the earth. The second main element is the heat pump, which is typically the same size as a fridge-freezer. This transfers and increases the heat from the ground loop. Finally you need a distribution system which basically means under floor heating or radiators.

Ground Source Heat Pumps are most suitable for homes that are well insulated, because otherwise they can become very expensive to install. The cost of a system is directly related to its size, which is in turn driven by the heat it needs to deliver. If you live in an older building with very high heat loss, this can add substantially to the capital cost on installing a heat pump. Money spent on upgrading wall, floor and loft insulation can save a large amount on this capital cost. Unfortunately, some older buildings can never be made sufficiently energy efficient to use the modern heating distribution systems that go with Ground Source Heat Pumps, such as low temperature under floor heating, or low temperature radiators.

You should consult a professional installer if you are considering such a system. They will be able to give you detailed advice on the suitability of your home. Issues that you should consider are things like whether you have enough space to dig the trench for the ground loop, what kind of heating distribution system you want (e.g. under floor heating), and the size of Heat Pump you will need.

With over 40% of carbon dioxide emissions coming from the heating of buildings in countries like the UK, energy-efficient systems like a Ground Source Heat Pump are looking more and more attractive. If your home is well insulated, and you have some outside space like a garden, it really is worth investigating a system like this to help cut your personal contribution to Climate Change, by making better use of the free heat supplied by the earth.



About Downwithco2.co.uk

DownwithCO2.co.uk makes it easy for people to make big cuts in their gas or electricity usage. By signing up for five basic actions on the site, people can initiate actions that will reduce their home's carbon dioxide emissions by over 3 tonnes a year with little or no impact on their daily lives. This is equivalent to taking a car off the road for each home. Even taking one or two of these steps has a big impact.

In under 30 minutes, householders can set in motion the following five changes:

1. Install home insulation
2. Upgrade to a super-efficient condensing boiler
3. Replace light bulbs with low energy bulbs
4. Buy an energy efficient fridge, dishwasher or washing machine when the current one needs replacing
5. Install a solar hot water system

The site also features information and contacts for more advanced measures to reduce carbon emissions, such as solar electricity and ground source heat pumps.