



Ground Source Heat Pumps

How does it work?

Ground source heat pumps (GSHPs) operate by transferring heat from the ground, using a buried loop filled with a mixture of water and antifreeze, to a property via a heat pump.

The heat pump - comprising an evaporator, compressor and condenser - converts the low-grade geothermal and ground energy naturally occurring in the earth to high-grade heat that can be used for space heating and/or hot water. The process is similar to that used in a domestic refrigerator but in reverse.

Electricity is required for the heat pump to function but this can be sourced from an alternative renewable source.

Air source and water source heat pumps are also available.

What are the benefits?

- Efficient way to heat a building – for every unit of electricity used to pump the heat, 3-4 units of heat are produced
- Can help contribute to reducing Carbon Dioxide (CO₂) emissions from properties
- Can be used at various scales from individual dwellings to groups of up to 10 or even a small block of flats
- Often no need for a planning application for most microgeneration installations at a domestic-level¹ - please contact the Council's Development Control Section for further details (e-mail: planning.applications@tmbc.gov.uk Tel: 01732 876230)
- Government grants available

When and where is it suitable?

GSHPs are particularly beneficial to individual dwellings isolated from gas mains.

Sufficient land by your dwelling needs to be available for the installation of the ground loop (average depth of a trench for a horizontal loop is 1.5 metres).

Distributing heat via an under-floor coil system is more efficient than radiators because the coils work at a lower temperature.

Where a planning application is necessary, you need to take into account other considerations including your property (Listed and/or in a Conservation Area). Please contact the Council's Development Control Section (e-mail: planning.applications@tmbc.gov.uk,

Tel: 01732 876230) for further advice. You will also need to consult the Council's Building Control Section (e-mail: building.control@tmbc.gov.uk Tel: 01732 876305).

Further detailed technical advice, including information on typical costs:

- **Centre for Alternative Technology**
http://www.cat.org.uk/information/info_content.tmp?sku=info_is_renewables/
Tel: 01654 705950
- An Eco-Centre providing practical advice and free information on GSHPs
- **Energy Saving Trust (EST)**
www.energysavingtrust.org.uk
Tel: 0800 512012
- a non-profit organisation providing general advice on GSHPs (click on 'Generate your own energy' tab on their home page) and technical advice for the development industry professionals (type 'Planners Pack' in the search box)
- **Low Carbon Buildings Programme**
<http://www.lowcarbonbuildings.org.uk>
Tel: 0800 9150990
- find out about available grants
- **London Renewables Toolkit**
www.london.gov.uk
Tel: 0207 9834000
The Greater London Authority has produced a useful toolkit for planners, developers and consultants (type 'London Renewables' in the search box)
- **Creative Environmental Networks (CEN)**
www.cen.org.uk
Tel: 0208 6836694
- not for profit organisation providing technical advice on GSHPs (click on 'Developer Support' and select 'Renewable Energy')
- **Kent Energy Centre**
www.kentenergycentre.org.uk
Tel: 0800 3586669
- not for profit organisation offering free and impartial advice on GSHPs (click on 'renewable energy solutions')

If you have difficulty reading this leaflet and would like the information in another format, please call 01732 876266 or email ldf@tmbc.gov.uk.

¹Exceptions apply for Listed Buildings, and buildings in Conservation Areas
Image courtesy of Energy Saving Trust