

HEAT PUMPS

Traditional fossil fuels are fast becoming exhausted. Burning these fuels damages the environment, and is becoming ever more expensive as cheap global oil and gas supplies decline. There are a number of options open to individuals and communities including improved house insulation, installing energy efficient and low energy devices, using solar power and other renewable energy sources such as wind power, bio mass or heat pumps.

This information sheet is about heat pumps.

A Ground or Air Source Heat Pump system recovers the renewable natural solar energy trapped in the ground or in the air around your house, using it to heat your home. It works on the same principle as your fridge and like your fridge uses electricity to drive its motor. The advantages are:

- **No Local emissions**
- **Works night and day, all year, in all weathers**
- **Free renewable energy**
- **Works with under floor, radiator or skirting systems**
- **Provides Domestic hot water**
- **Can save up to 75% of your heating costs**
- **30 years proven technology**
- **A reduction in CO₂ emissions of up to 60% (compared to a modern condensing gas boiler).**

Ground Source Heat Pumps: Heat collection is achieved by installing a series of pipes in the ground. They are buried at least 1.2 meters deep and contain a water glycol mix at a low temperature. The surrounding soil is at a higher temperature, typically 10-13°C and gently warms the glycol mix as it is pumped around the ground loop. A temperature increase of the ground loop fluid of just 3 or 4°C is all the heat pump requires. Alternatively, where land is limited the pipes can be installed in bore holes. The returning warmed liquid is fed into a heat exchanger/evaporator where it turns into gas. In the compressor, this gas is compressed, creating heat. The heat is conveyed into the house's heating and hot water system. The pressure of the gas is reduced via an expansion valve and the refrigerant turns into a liquid form and is recycled round the system.

Air Source Heat Pumps: Thermal energy is extracted from the air transferring this energy to a heat pump system which then operates on the same principle as a ground source system, using a fan which passes air over a collector plate. The system is still effective at minus 15°C and is used extensively in Northern Europe.

Costs: The Energy Saving Trust estimates that costs for installing a *typical ground source system* range from about £7,000 to £13,000. Running costs for a year, where all hot water and all space heating can be provided by the system are likely to be around £540 per year, but will depend on a number of factors (including the size of your home and how well insulated it is).

They estimate a *typical air source system* suitable for a detached home will range from about £5,000 to £10,000 including installation. Running costs for space heating are likely to be around £440 per year. This will vary depending on a number of factors (including the size of your home and how well insulated it is).

A government grant is available, currently £1200.00 <http://www.energysavingtrust.org.uk>.

Installers:

- Ice Energy based near Oxford claim to be the UK's biggest supplier. The firm supplies Swedish manufactured pumps (<http://www.iceenergy.co.uk>)
- Worcester is a traditional boiler manufacturer who now supplies ground and air source pumps (www.worcester-bosch.co.uk)
- Southampton based GEC-CO provide a consultancy, supply and installation service for air and ground source pumps and other renewable energy sources (<http://gec-co.co.uk>)

More extensive information can be found on the Energy Saving Trust's website:

www.energysavingtrust.org.uk/Generate-your-own-energy/Ground-source-heat-pumps

