

Heat Pumps

RENEWABLE TECHNOLOGY THAT CONVERTS ENERGY
IN THE GROUND AND AIR INTO HEAT



SAVE UP TO
£540
on your heating bill

Heat pumps are a renewable, energy-saving technology that use heat from the air or ground to provide heating for buildings.

This heat originates as solar energy before it is absorbed by the ground or air. This technology will replace your existing heating system i.e. a boiler.

HOW DO GROUND-SOURCE HEAT PUMPS (GSHPs) WORK?

- ▶ Loops of pipes, filled with anti-freeze fluid, are placed in trenches approximately 2 metres underground. Here the temperature is relatively constant at approximately 8-11°C. The fluid absorbs the thermal energy from the ground and then transfers it to a liquid refrigerant, through a heat exchanger. This causes the refrigerant to vaporise.
- ▶ The vaporised refrigerant is then compressed, causing its temperature to greatly increase. This heat energy can then be used to heat water or a

- ▶ The refrigerant then condenses back into a liquid and is passed through an expansion valve, where the pressure, and temperature are reduced and the cycle can begin again.

- ▶ The loops of anti-freeze fluid can also be installed vertically in bore holes if there is insufficient space round the building, however this can increase installation and maintenance costs due to the need for deeper drilling.

HOW DO AIR-SOURCE HEAT PUMPS (ASHPs) WORK?

- ▶ Air-source heat pumps work in a similar way to GSHP's, the difference is that the heat source comes from the air.
- ▶ Even in winter, the air contains thermal energy which can be transferred to a refrigerant. Refrigerants have very low boiling points, and so ASHP's can work when outdoor temperatures reach as low as -20°C.

There are two types of air-source heat pumps:
1) **Air-to-air** pumps produce warmed air which can be used for heating rooms

2) **Air-to-water** pumps produce hot water and can be used in central heating systems and for hot water

WHAT ARE THE BENEFITS OF HEAT PUMPS?

They are super energy efficient!

The Coefficient of Performance (CoP) describes how much heat energy is produced per unit energy supplied to the system. Heat pumps are highly energy efficient; a GSHP can have a CoP of up to 4 and an ASHP has a CoP of 2, while a gas boiler has a CoP of only 0.93.

You can earn whilst you generate

There is potential to earn money from the government from generating heat using a heat pump through the [Renewable Heat Incentive](#) – up to £1030 per year.

Enjoy lower heating bills

Using a heat pump can save up to £545 per year on heating bills, compared to an old (G-rated) oil boiler.

It will lower your carbon footprint

Using a heat pump can reduce carbon emissions by up to 6100kg per year, compared to an old (G-rated) oil boiler.



Air-source heat pump
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Underfloor heating
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A COUPLE OF THINGS TO CONSIDER

► The perfect partner for a heat pump is wet underfloor heating because both work at lower temperatures - underfloor heating is often better to install when building or renovating a property.

► Heat pumps warm the air gently, so they're not ideal if your home heats up and cools down quickly. For this reason, they work most efficiently in homes with good insulation and draught proofing.

Learn more about our home insulation services:
www.healthy-housing-service.com

FIND OUT IF YOUR HOME IS SUITABLE FOR A HEAT PUMP

NEP can offer free impartial advice on this technology and many others, we can also point you in the right direction of an accredited, reputable local installer.

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