It pays to use renewable heating systems

Through money saving efficiency and the Government's financial incentives, the payback period of our renewable heating systems makes them a very attractive, viable alternative to traditional heating and biomass systems.

- Capital expense kept to a minimum with easy installation
- Reduced energy use and running costs through efficiency and control
- Low maintenance costs and 5-year warranty from leading manufacturer
- Financial reward through the Renewable Heat Incentive (RHI)

From April 2011, the RHI is intended to offer financial support for renewable heating across England, Scotland and Wales. It aims to bridge the financial gap between conventional and renewable heating in domestic, commercial and industrial properties. Covering a wide range of renewable technologies, including heat pumps, the RHI will see energy users paid for every kW of renewable heat.

Currently in consultation, details are still to be finalised - visit www.decc.gov.uk - but it's expected that the RHI will:

- Compensate investors (system owners) for the cost of renewable heat
- Support 'useful' renewable heat, such as space and water heating
- Pay a return on investment of around 12% across all technologies
- Reward by either deemed heat load (EPC) or by metered kWh generated
- Reward for the expected life of a system - ranging anywhere between10 to 23 years

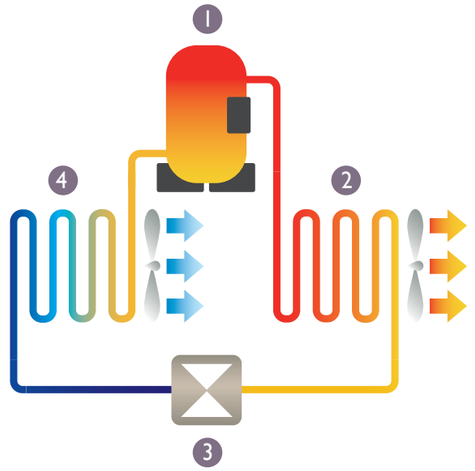
As legislation continues to impose the wider use of renewables, the financial rewards of changing to renewable heating will make it a change worth making.

Simple design for complete flexibility

The simple design of our heating systems uses proven heat pump technology to harness renewable energy from the air, ground or water, providing maximum heat for minimal energy.

How heat pump technology works

Our heating systems require only a small amount of electricity to upgrade and move heat from one location to another. The heat is upgraded to a higher temperature using the refrigerant cycle and is then used to deliver efficient heat to any building via a ducted air or wet system.



1. **Compression:** Refrigerant in its vapour state is compressed, forcing it to occupy less space. This heats the vapour to temperatures of 75°C to 80°C.
2. **Condensing:** The hot pressurised refrigerant vapour is then passed through a heat exchanger. The vapour is condensed into a liquid and the heat generated is transferred to heat the air and/or water that is used within the building.
3. **Expansion:** The cooled refrigerant liquid is then passed through an expansion valve which reduces the pressure on the refrigerant allowing it to return to its normal state.
4. **Evaporation:** Liquid refrigerant is passed through a second heat exchanger. Because refrigerant has a very low boiling temperature (as low as -50°C), the refrigerant evaporates, absorbing heat energy from the surrounding environment. This can be air, water or the ground.

Able to deliver up to 5kW of heat for every 1kW of electricity consumed, our heat pump heating systems offer as much as 500% efficiency and a COP of 5 - **making them an ideal renewable heating solution**.

Air Source Heat Pump

Ground Source Heat Pump

Air source
heat pumps

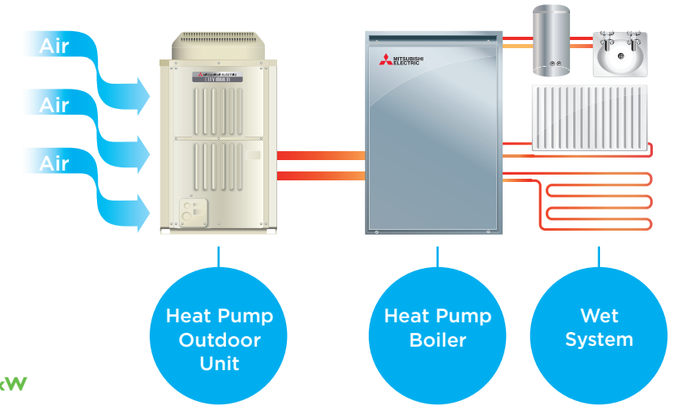
Air source heat pumps (ASHP) extract heat from the outside air. This is then used to deliver heat to the building via a ducted air (for example) or wet system.

Recognised as a renewable technology, ASHP outdoor units are sited on the roof or ground. Able to work at outside temperatures as low as -20°C, they prove ideal for use in any UK commercial property.

Air to Water

The outdoor unit harvests free renewable heat from the outside air, upgrades it to a useful temperature and then transfers it to the boiler which heats the water that is fed to the radiators or underfloor heating and sanitary hot water.

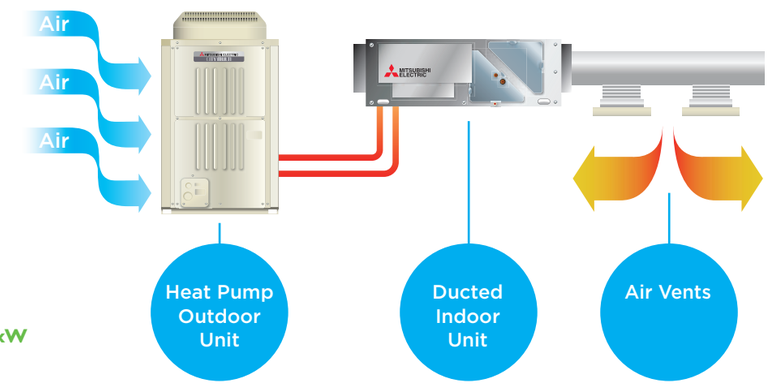
Seasonal Coefficient of Performance (COP)	3.71
Heat source temperature	Air -3°C
Heating capacity delivered	25kW
Refrigerant pipe length	40m
Renewable heat delivered	**73% or 18.3kW**



Air to Air

The outdoor unit harvests free renewable heat from the outside air, upgrades it to a useful temperature and then transfers it to the fan coil which heats up air supplied to the building via ductwork and grilles.

Seasonal Coefficient of Performance (COP)	3.26
Heat source temperature	Air -3°C
Heating capacity delivered	25kW
Refrigerant pipe length	100m
Renewable heat delivered	**69% or 17.3kW**



Ground source
heat pumps

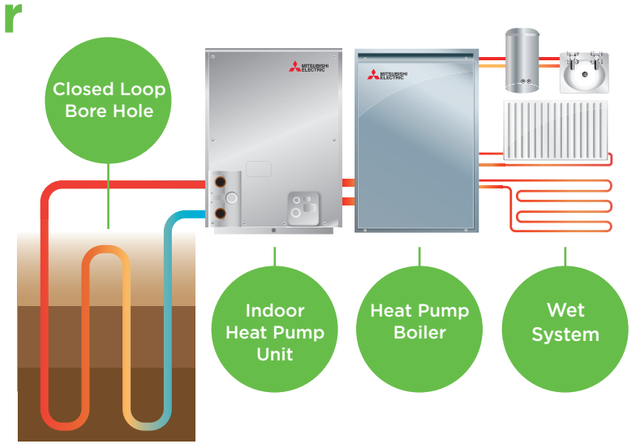
Ground source heat pumps (GSHP) use closed or open loop circuits to extract heat from the ground. This is then used to deliver heat to the building via a ducted air or wet system.

Recognised as a renewable technology, GSHP offer the highest energy efficiency possible. Ideal for any commercial property including schools, universities and hospitals.

Ground to Water

The ground source unit harvests free renewable heat from the ground or a body of water via pipework buried in the ground using pumped water as a means of transferring the energy. This heat energy is upgraded to a useful temperature and then transferred to the boiler which heats the water that is fed to radiators or under floor heating.

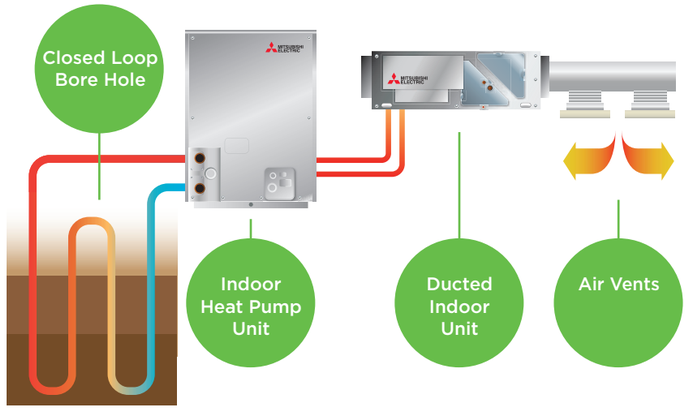
Seasonal Coefficient of Performance (COP)	5.34
Heat source temperature	Water 2°C
Heating capacity delivered	24kW
Refrigerant pipe length	2m
Renewable heat delivered	**81% or 20.5kW**



Ground to Air

The ground source unit harvests free renewable heat from the ground via pipework buried in the ground using pumped water as a means of transferring the energy. The heat is upgraded to a useful temperature and then transferred to fan coil which heats up air supplied to the building via ductwork and grilles.

Seasonal Coefficient of Performance (COP)	4.30
Heat source temperature	Water 2°C
Heating capacity delivered	25kW
Refrigerant pipe length	100m
Renewable heat delivered	**78% or 19.2kW**



Air source heat pump system design

The principal design layout of an **air to water** heat pump system consists of an outdoor unit connected via two-pipe technology to an indoor unit, which in turn delivers heat indoors via radiators, underfloor heating or air handling units.

Refrigerant Pipework

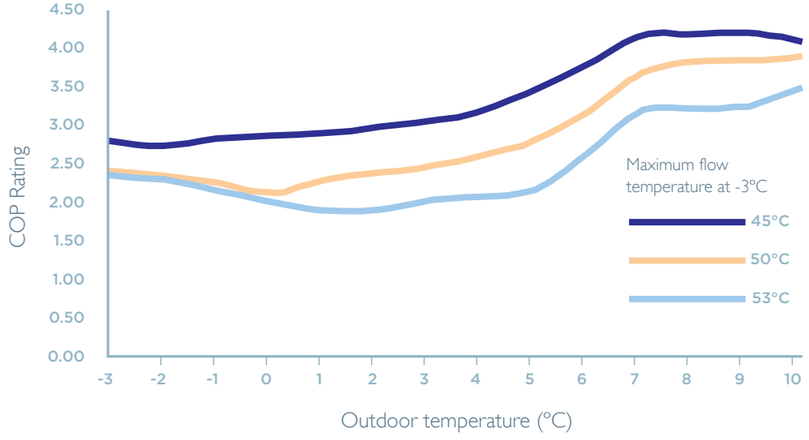
Outdoor unit
Situated outside at roof or ground level, upgrades free renewable heat found in the outside air to deliver heat to an indoor water based system

Indoor unit
Designed to easily install into the similar space required by a traditional boiler, our advanced units deliver optimum flexibility and efficiency

Water Pipework
Flow and return pipework provides flow temperature of 45°C to 55°C depending on the outdoor configuration

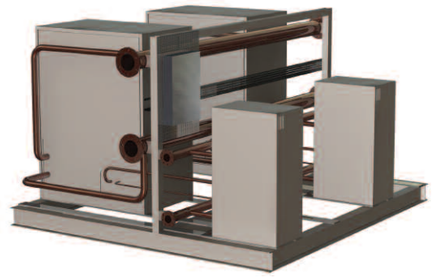
COP ratings as high as 4.3

This chart shows the fluctuation in COP ratings during a typical annual heating season. A lower flow temperature can be used by increasing the surface area of heat emitters, the benefit of this is higher efficiency and increased annual savings



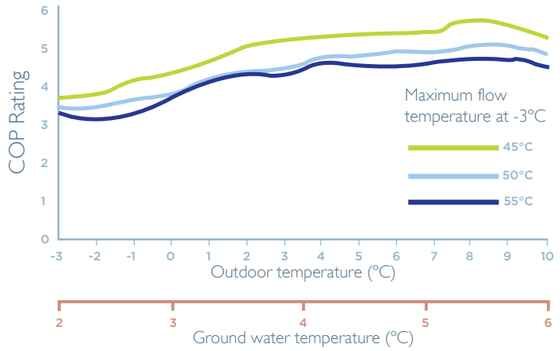
Ground source heat pump system design

The principal design layout of a **ground to water** heat pump system consists of an open or closed loop circuit connected to an indoor unit, which in turn delivers heat indoors via radiators, underfloor heating or air handling units.



COP ratings as high as 5.5

This chart shows the fluctuation in COP ratings during a typical annual heating season



Open or closed loop circuit
Situated outside in the ground (or body of water), these circuits use energy found in the ground to deliver heat to indoor water based system

Packaged unit
Our advanced units are ready assembled for ease of installation. Pre-plumbed and pre-charged the units require only a water connection on site to ensure that installation time and costs are kept to a minimum

Water Pipework
Flow and return pipework provides flow temperature of 55°C

Seasonal COP

Met Office data
Using Met Office data this chart shows that, despite temperatures dropping in the winter, the number of hours spent below 4°C is very low

Flow temperature control
Using flow temperature control (weather compensation) for optimum efficiency our systems adjust to ensure the output heat accurately matches the demand

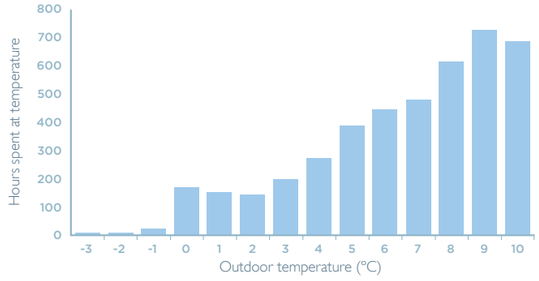
True seasonal COP ratings
Using the above data ensures we provide true seasonal COP ratings rather than giving COP ratings for one set condition

True seasonal COP ratings

Max Flow Temp at -3°C	Air to Water	Ground to Water
45°C	3.71	5.34
50°C	3.17	4.78
53/55°C*	2.66	4.51

* Depending on system configuration

Met Office data



Flow temperature control