

Find out how air source heat pumps work, how much they cost, and how much they could save you on your energy bills.



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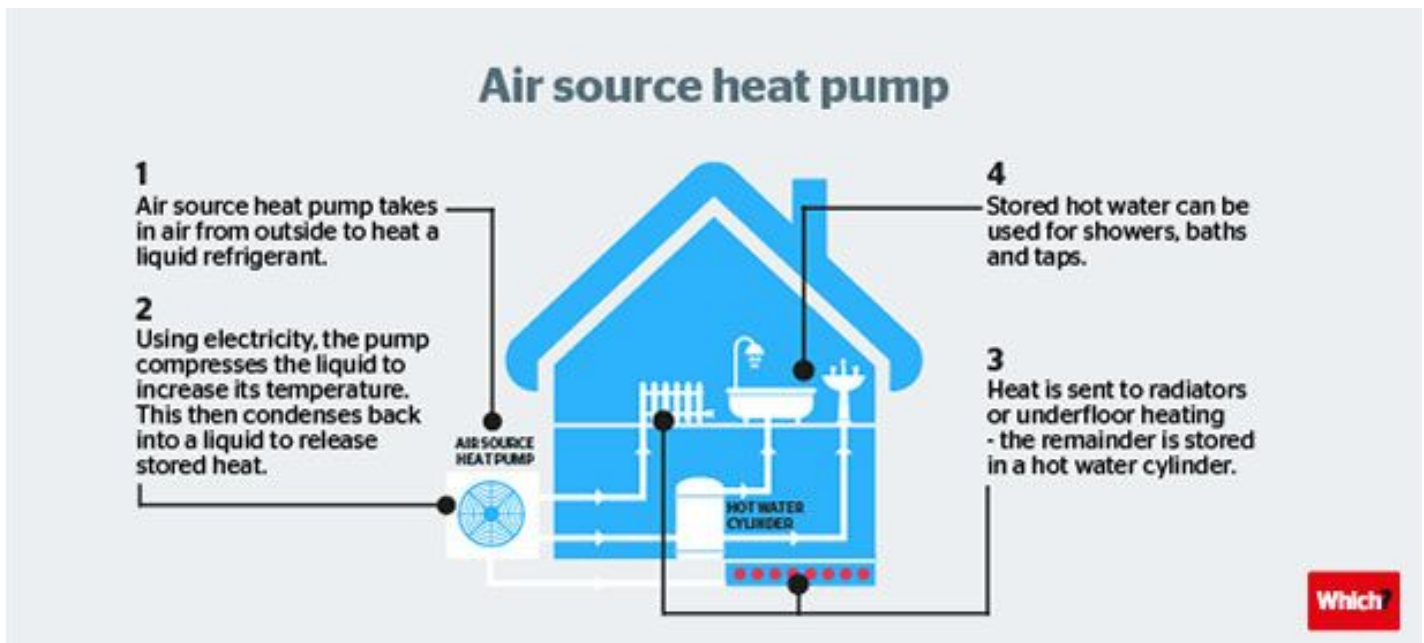
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Air source pumps serve as an alternative way to heat your home, and could be the ideal solution if you want to generate your own heat and potentially save money on your energy bills.

How does an air source heat pump work?

An air source heat pump is usually placed outdoors at the side or back of a property. It takes heat from the air and boosts it to a higher temperature using a heat pump. The pump needs electricity to run, but it should use less electrical energy than the heat it produces.

Take a look at our graphic below for a visual representation of how an air source heat pump functions.



Types of air source heat pumps

There are two main types of air source heat pumps (ASHPs): air-to-water and air-to-heat.

An ASHP works a bit like a refrigerator in reverse. The process consists of an evaporator, a compressor and a condenser. The ASHP absorbs heat from the outside air into a liquid at a low temperature, then the heat pump compressor increases the temperature of that heat. In the condenser, the hot liquid's heat is transferred to your heating and hot-water circuits. So you can use it to warm up your home.

Air-to-water heat pumps

These take heat from the outside air and feed it into your wet central heating system. As the heat produced is cooler than that from a conventional boiler, you may need to install larger radiators or [underfloor heating](#) to make the most of it.

Air-to-water heat pumps may be best suited to new-build properties. It could cost less if the heat pump is included as part of the building specification, rather than having to retrofit underfloor heating later on.

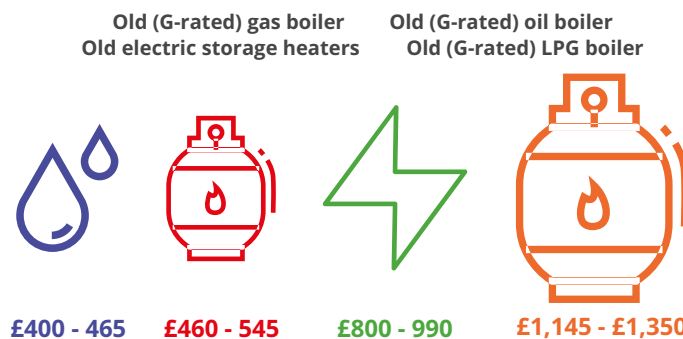
Air-to-air heat pumps

These pumps take heat from the outside air and feed it into your home through fans. This type of system cannot produce hot water.

What are the running costs?

The payback period (the time taken to recoup the cost of the system in energy savings) depends on how efficiently your system works, the type of heating system you're replacing, whether you can get money with the RHI and how you'll be using the heat generated by the pump. Read our guide on the [Renewable Heat Incentive](#)

Below, you'll see how much you could potentially save by replacing your existing system with an air source heat pump.



Figures above show potential annual savings of installing a standard air source heat pump in an average sized, four-bedroom detached home. Figures courtesy of Energy Saving Trust website. Accurate as of June 2018.

The EST also estimates annual RHI payments between £875 to £1,030 a year.

But if you're replacing a new heating system, an air source heat pump could actually work out more expensive.

- Replacing a new (A-rated) gas boiler – £35 to £55 bill increase
- Replacing a new (A-rated) oil boiler – £45 to £55 bill increase

Installing an air source heat pump

ASHPs look similar to air-conditioning units. They are less disruptive to install than ground source heat pumps, as they do not require any digging in your garden.

They are also cheaper than ground source heat pumps. The Energy Saving Trust (EST) estimates that the cost of installing a typical ASHP system ranges between £6,000 and £8,000.



In the summer, an air-to-air heat pump can operate in reverse. In other words, you can use it like an air-conditioning unit to provide cool air for your home.

Pros and cons

Air source heat pumps require little maintenance and can provide heating and hot water, but they aren't flawless systems. See the key advantages and disadvantages associated with using this heating system below:

Pros	Cons
<p>Energy efficient – air source heat pumps can generate less CO2 than conventional heating systems.</p>	<p>Lots of space needed – you'll need enough space in your garden for the external condenser unit (comparable in size to an air-conditioning unit).</p>
<p>Easy to install – they are easier to install than ground source heat pumps, particularly for retrofit.</p>	<p>Loud – condenser units can be noisy and also blow out colder air to the immediate environment.</p>
<p>RHI approved they can qualify for the RHI, a financial incentive that pays you for generating your own heat through renewable technology.</p>	<p>Electricity you still need to use electricity to drive the pump, so an air source heat pump can't be considered completely zero-carbon unless this is provided by a renewable source, such as solar power or a wind turbine.</p>

Are air source heat pumps efficient?

An air source heat pump system can help to lower your carbon footprint as it uses a renewable, natural source of heat – air. The amount of CO2 you'll save depends on the fuel you are replacing. For example, the figure will be higher if you are replacing electric heating rather than natural gas.

A heat pump also requires a supplementary source of power, usually electricity, to power the heat pump, so there will still be some resulting CO2 emissions.

Meanwhile, ground source heat pumps draw heat from the ground via a network of water pipes buried underground, usually in your garden.