

- Heating systems
- Air conditioning
- Renewables



Kills bills

How Vaillant technologies
reduce home heating bills



Energy efficiency is a choice

For most people, home heating and hot water systems have always been out of sight and out of mind. But now, with continued rises in energy prices and concerns about carbon emissions, your choice of home heating products is becoming increasingly important.

By making an informed choice and investing in the future, you can dramatically reduce your energy consumption and energy bills. This guide shows you the different technologies available from Vaillant, explaining what they are, how they work, how energy efficient they are and their suitability for your home.

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Condensing boilers explained

What are they?

There are three different types of domestic heating and hot water boiler, combination boilers (known as 'combis'), system boilers and open vented boilers. Since April 2005 your new boiler, to comply with current building regulations, has to be a high efficiency boiler (these types of boiler are frequently referred to as condensing boilers). This is a boiler that recovers heat that would otherwise be wasted and uses it to improve the boiler's heating efficiency.

How do they work?

High efficiency boilers have a heat exchanger that extracts heat from the water vapour in the flue gasses and uses this to pre-heat the return water to the boiler. This improves the boilers overall efficiency giving a greater heat output and reduces the amount of fuel used. During operation this creates condensate (water vapour) within the boilers heat exchanger which needs to be drained away from the boiler. For this simple plastic pipe can be used or alternatively Vaillant can supply a small intelligent condensate pump that can be linked to direct to the boiler.

How energy efficient are they?

Vaillant SEDBUK 'A' rated boilers in the ecoTEC range operate with an annual average efficiency of over 90%*.

Typically, older types of conventional boilers only achieve efficiencies of 56%*. That means your condensing boiler will use 35% less energy to deliver heating and hot water to your home. This is how a condensing boiler can save as much as 35p in every £1* you spend on energy. This can amount to a saving of over £310* on your annual home heating bill.



*Energy saving and consumption calculated using DEFRA data for a three bedroom semi-detached house with an old heavyweight boiler. Money saving calculated using British Gas Websaver 4 Tariff September 2009

Which type will suit your home?

These are the three types of condensing boiler now available:

Combination boilers

A combi boiler eliminates the need to store hot water so there is no hot water cylinder in the airing cupboard.

It is both a high efficiency water heater and central heating boiler. The boiler runs 'on demand' and provides hot water to the heating system in the house or flat.

System boilers

System boilers are often referred to as sealed system boilers because the system is filled to approximately 1 bar pressure and sealed.

They are connected to a hot water storage cylinder, usually installed in an airing cupboard. This type of boiler does not need an expansion tank in the loft. They are particularly good for homes with more than one bathroom because the combination of boiler and hot water cylinder can deliver hot water quickly to several outlets simultaneously.

Open vent boilers

Open vent systems are normally connected to two tanks in the loft. A small 'feed and expansion tank' supplies water to the boiler and the radiators. A larger domestic cold water storage tank provides the cold water feed to an open vent hot water cylinder. Although replacing the boiler and linking it to an existing open vent system is an option, most people opt to remove the tanks from the loft and to install a sealed system boiler or a combi.

The table below shows which types of boiler suit various types of property:

Location:	Suitable boiler type:
Flat or bungalow with no roof space	Combi
2 or more bathrooms	System or Open vented
Low mains water pressure	System or Open vented
Upgrade an existing conventional boiler to a high efficiency boiler	System, Open vented or Combi
Many people in the home needing hot water on demand	Combi or system boiler with hot water cylinder
Loft conversion	Combi

Source: British Gas

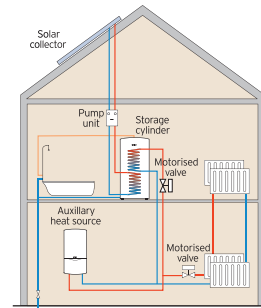
Solar systems and using solar energy

What are they?

Solar systems collect the sun's energy in tubes or plates mounted on the roof. These are connected to a cylinder that delivers domestic hot water to taps and appliances. A supporting high efficiency boiler is also connected to the system to back up the solar hot water supply when solar energy levels are low, for example in mid winter, or at times of peak demand in the home.

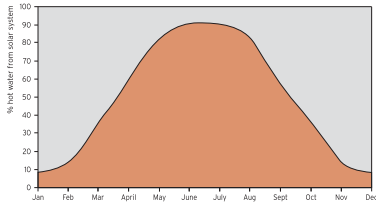
How do they work?

The tubes or plates on the roof contain a highly effective absorber of solar radiation. This material collects heat, transferring it to 'solar fluid' contained in pipes within the collection tubes. This heated fluid then circulates through a coil in the cylinder, heating the water for household use. A solar control unit monitors the temperature of the collector and of the cylinder. When sufficient solar energy is available the control switches on the solar pump to heat the cylinder. If insufficient solar energy is available the controller activates the boiler. By automatically switching between the two the system minimises energy use while ensuring there is always hot water on demand.



A typical solar hot water and home heating installation.





Typical contributions made by solar heating to domestic hot water supply in the UK throughout the year.

How energy efficient are they?

You might think that the UK would be a poor location for a solar heating system. In fact from April until September solar systems can provide as much as 60%-90% of domestic hot water requirements. Even in mid winter a solar system can contribute 10% of daily hot water demands. That's because solar collectors can absorb solar radiation even when the sky is overcast. Overall, a typical solar hot water system will provide 50%-60% of annual domestic hot water needs. That means your hot water bill can be cut by over 50%, a big saving at a time of escalating energy costs.

Is solar right for your home?

If your house has a pitched roof that faces South and is not shaded by trees or other buildings, a solar system will work most efficiently. If the roof faces between 30 degrees East and 40 degrees West of South the system will work with a small loss of efficiency. Even so, this loss can be compensated by installing a larger area of tubes or plates. On flat roofs solar panels can be installed on A frames and angled to optimise their efficiency. Solar panels can be mounted above the tiles or slates, alternatively the flat plate collectors can be integrated into the roof to improve the appearance.



Heat pumps and using the earth's natural energy

What are they?

Ground source heat pumps collect energy stored in the earth and use it to heat water in a cylinder for distribution to taps, appliances and radiators. They can also cool the house in summer. This is the most advanced technology available for home heating, hot water and cooling. Because the earth itself 'stores' energy it is an extremely reliable and constant energy source, it creates no harmful emissions and uses a very small amount of electricity to drive the pumps themselves.

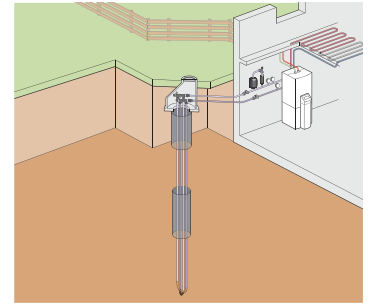
How do they work?

A heat pump works in the same way as a refrigerator, but in reverse. The collection system consists of a single deep borehole in the garden. Alternatively, where space permits, a looped array of pipes buried about 1.2 metres below the surface can be used. The ground source heat pump then extracts heat stored in the earth. This low temperature energy passes through a CFC-free refrigerant circuit which converts it into higher temperatures to heat the home. In summer, with an underfloor heating system connected to the heat pump energy flow can be reversed, cooling the room to a comfortable temperature. If you're considering having a ground source heat pump installed you may be eligible for a grant through the Low Carbon Buildings Programme.

Visit www.lowcarbonbuildings.co.uk for more information.

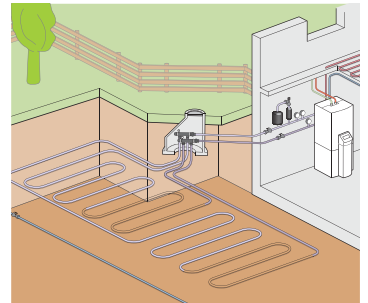
Vertical ground loop collector:

The ground collector is positioned vertically in the soil and therefore is extremely space-saving. Vaillant will support you to find a partner for the required drilling.



Horizontal ground loop collector:

In a depth of about 1.2 metres, the ground loop collector system is laid horizontally in the earth and here it gains the heat contained in the soil.



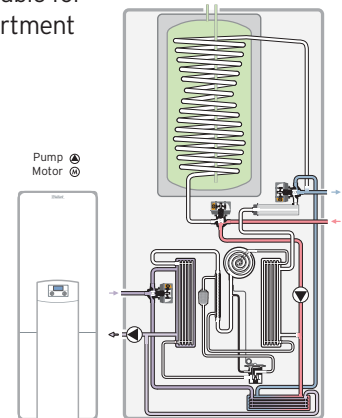
How energy efficient are they?

Heat pumps provide background heating and cooling as well as hot water to appliances and basins, with extraordinary energy efficiency. The only energy consumed is for the periodic operation of the pump. The heat pump unit also contains a 4kW immersion heater that if necessary automatically boosts the hot water temperature and at times of peak demand. With the

exception of this supporting immersion heater, heat pumps make households virtually independent of conventional energy sources. As much as 75% of energy needed for heating and hot water can be provided by heat pumps using a zero-cost natural source of energy.

Is your home suitable for a heat pump?

The heating characteristics of heat pumps make them ideal for homes with underfloor heating. They are suitable for all types of houses and small apartment blocks. The vertical borehole requires minimal space in the area around the building. The only limitation for heat pumps is in achieving a satisfactory balance between the energy loss of the building and the required flow temperature of the heating system. For these reasons heat pumps are most suitable for new buildings and major refurbishments.



Programmable controls for economy

What are they?

Programmable controls provide a comfortable living environment within your home and help to minimise domestic heating bills. Temperature data from thermostats and sensors is fed back to the boiler maximising operating economy. These controls also give you a wide choice of control options to further optimise heating efficiency and fuel economy. Many of these functions can be set up by the installer and left alone. Those requiring homeowner inputs are very easy to operate.

How do they work?

Programmable controls are either fitted into the fascia of the boiler or wall mounted in a convenient location within the home. The thermostats in the heating zones and outside sensors are then linked to the boiler. There are three areas of control that greatly improve the economy of your boiler:

Load compensation

This reduces the temperature of hot water going to radiators as the target room temperature is approached, cutting back energy consumption.

Advanced timing control

Offers different settings for groups of days of the week and three switching periods per day. Summer and winter settings, holiday mode, hot water advance and temporary over-ride options all further help to optimise boiler use, maximise your home comfort and reduce energy consumption.

Weather compensation

With this option, outside sensors measure temperature changes and adjust the boiler performance to maintain the desired inside temperature, allowing your boiler to operate with maximum efficiency.





How energy efficient are they?

Correctly setting up controls of any type will help you to reduce your energy consumption. With daily switching period settings, seasonal settings, load compensation and weather compensation all maximising efficiency, Vaillant estimates that a further 5%-10% saving on energy bills can be achieved with the use of programmable controls.

Are they suitable for your home?

All of these control options are available for use with all Vaillant high efficiency boilers in houses with one heating zone. Some controls are suitable for houses with two heating zones - for example independently controlled upstairs and downstairs areas. With an additional accessory, programmable controls can also be used with sealed system boilers and open vented boilers with hot water cylinders.

Vaillant Time Control Options*

Flexible programming: e.g. daily, weekdays or weekends

3 switching periods per day

Summer and winter settings

Holiday mode

Hot water advance

Temporary over-ride

About Vaillant

The Vaillant story began over 135 years ago with the invention of the first practical gas powered hot water system. The company has been established in the UK for over 30 years and in that time has grown to become the market leader in technology, innovation and performance. Worldwide, there are over 2.4 million Vaillant appliances in daily use. Today, Vaillant is leading the field in renewable technology with solar powered hot water systems, heat pumps and in home heating efficiency with intelligent controls.

When you buy Vaillant you also buy the best in installation, maintenance and service thanks to Vaillant installers' high standards of training and professionalism. That's why you'll feel more comfortable with Vaillant.

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