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The truth and misconceptions about heat pumps:

The following article is designed to address some of the questions which are often asked about Heat Pumps.

How does a heat pump work? They absorb heat from water, the ground or the air and transfer this low grade heat to a refrigerant gas through a heat exchanger. The gas is compressed which increases its temperature and as it passes through a second heat exchanger the heat is transferred into the water that circulates through your heating system. This is basically how a fridge works but in reverse.

Do they use a lot of electricity? They do use some electricity but they are extremely efficient. For every one kilowatt of electricity used they produce at least 3 ½ kilowatts of heat. That's the equivalent of 350% efficient. The best oil or gas boiler is between 90 – 95% efficient. Replacing a gas boiler with a heat pump should provide equivalent running costs. Yes, electricity is more expensive than gas but heat pumps are so much more efficient. Replacing an oil boiler with one should see considerable running cost savings. Ground Source heat pumps are even more efficient because they extract their heat from under the ground, often at a consistent 10 degrees.

How much space does a ground source heat pump require? On average between 600 -12,000 square meters of ground into which a trench, approx. 1.5 meters deep is dug to take loops of pipe to extract the heat. An alternative is to drill a bore hole, 50 – 200 meters deep. Ground Source heat pumps however are much more expensive.

Are they noisy? No. Many of the modern ones run at about 40 decibels which is the equivalent of quiet conversation. Some of the early heat pumps were noisy but a modern heat pump is just as quiet as a fridge. They must however be sensibly sited. Placing the heat pump under what may at night time be an open bedroom window is not ideal and there are rules as to how close to your boundary they are placed.

Can they be installed in a poorly insulated house? Obviously the better insulated a property, the cheaper the heat pump will be to run but that is true with any heating system. There are now high heat output pumps available which are specifically designed for poorly insulated properties. It is always recommended that insulation is improved as much as possible.

What is a hybrid system? With a large and difficult to heat property, it is sometimes recommended a heat pump be installed in tandem with an existing oil or gas boiler. The heat pump provides the majority of background warmth, boosted by the other boiler during periods of colder weather.

Will a heat pump work with microbore pipes? Microbore pipe work can sometimes offer technical difficulties, but this is usually overcome, sometimes with the installation of a second circulation pump and heat exchanger.

I don't have under floor heating so can I have a heat pump? It is true that heat pumps work best with under floor heating but they will also work quite adequately with radiators.

I've heard that heat pumps don't get very hot so will they get hot enough to heat my house? Unlike a gas or oil boiler which brings the radiator temperatures up to between 60 - 70° with a blast of heat, heat pumps work most efficiently when the radiator or under floor pipework has a flow temperature between 45 and 50° They are designed to bring the house temperature up gradually, working quietly in the background to gently maintain a comfortable temperature.

Will I have to change my radiators? Not always, but the heat requirements of each room should be carefully calculated during the initial survey and it may be suggested certain radiators are increased in size. This is because working at lower temperatures the system will sometimes require larger radiator areas to adequately disperse the heat into a particular room.

Is it true that heat pumps are very expensive? Compared with replacing a gas or oil boiler yes they are more expensive but prices are coming down and over time will pay for themselves as they are so much more energy efficient. There is currently a government grant of £7,500 towards the cost.

I've heard Government Grants are complicated to apply for. Unlike previous grants, the Boiler Upgrade Scheme (BUS) is actually applied for by the installer but they and the equipment must be MCS (Microgeneration Certification Scheme) registered. The property should also have a valid EPC (Energy Performance Certificate.) Full details of the Boiler Upgrade Scheme can be found under the resources section on Streton Climate Care's website www.strettonclimatecare.org.uk Information sheet No. 35.

I've heard heat pumps require planning permission? Not normally as they are permitted development. In certain circumstances where the building is listed or in a conservation area, permission may be required.

Are heat pumps reliable? Yes. As said earlier they use the same technology as a domestic fridge or freezer, but in reverse. The technology has been around for over 150 years. As with any piece of equipment it is recommended that they receive an annual service to ensure they are running efficiently and the filters are cleaned.

Do heat pumps require a hot water tank? Usually yes, because a heat pump doesn't provide hot water on demand like a combi boiler.

I've been told heat pumps don't work when the temperature drops below freezing? This is simply not true. Heat pumps are very common in northern European countries with much lower winter temperatures. Just as with an oil or gas boiler, the colder it is the harder any heating system must work.

Photo: Alaska Heat Smart

I'm told heat pumps are complicated to use. Once properly set up, they are no more complicated than a gas or oil boiler. You simply set the required thermostat temperature and leave it alone.

I've heard heat pumps cause legionnaires disease because the water never gets hot enough. It is true that Legionnaires bacteria survive in cooler water, but a modern heat pump system is designed to heat the domestic hot water to 60 degrees once a week to combat this.

I'm told heat pumps are complicated to install. Yes, more complicated than a gas or oil boiler but no problem for a qualified and competent heat pump installer who should be MCS certified. It is recommended they carry out a proper assessment of the thermal needs of the property when designing the system.

Can an air source heat pump be mounted indoors? Possible but not recommended. Because the pump extracts warmth from the air, having one inside would result in that space becoming very cold. If it must be inside, then special ducting is required to bring both outside air into the pump and then extract it to the outside.

Is there a working heat pump I can have a look at? There are increasing numbers of heat pumps in the community and Stretton Climate Care can put you in touch with an owner. They are usually most willing to show off their installation.

Is there anything else I need to know about heat pumps? Yes, and this is very important. They don't burn carbon-based fuels and especially if your electricity comes from a renewable source heat pumps provide a low or zero carbon heating system. People are increasingly changing over to a heat pump when their ageing oil or gas boiler needs replacing.