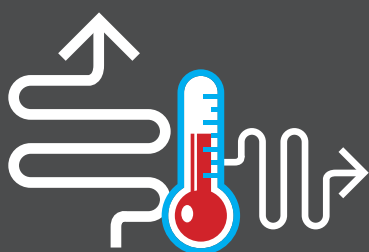



NFU Energy guide to heat pumps



WHAT IS A HEAT PUMP?

A heat pump is a device that takes low temperature (low grade heat) and upgrades it to higher temperature (high grade heat). They work essentially by acting like a fridge or freezer but in reverse. With a fridge the inside is cold and the outside is warm, we want the inside of the building to be warm and the outside to be cold. Most heat pumps use a refrigerant which is pumped around a system of pipework from a heat source (air, water, or ground), to the area where heat is required. The low grade heat which is captured, is boosted by a compressor into a higher grade usable heat.

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DIFFERENT TYPES OF HEAT PUMPS

Heat pump systems are able to utilise a number of different heat sources. The most common heat pump for domestic heating is the air source heat pump. It absorbs heat from the outside air, however as air temperature varies considerably they are not the most efficient. Ground & water source heat pumps can get to much higher efficiencies, and often have lower running costs thanks to a more constant heat source, however the installation costs are usually more expensive to install as they need pipework underground or into water. You can also have a heat pump system that uses waste heat as a heat source, there are examples in the UK of large glasshouses recovering waste heat from nearby sewage treatment plants.



WHAT ARE THE BENEFITS?

Heat pumps are able to provide space and water heating without any fuel, other than the electricity to run them. You should expect to get three or four units of heat for every one unit of electricity used. This compared to an immersion heater where you typically get 1 unit of heat for 1 unit of electricity. The ratio of electricity consumed, to heat produced is known as the Coefficient of Performance (COP).

The UK is investing heavily in renewable electricity generation, which in turn is reducing the carbon intensity of the UK grid, this makes using electricity for a source of heat even more favourable. If you are able to power a heat pump using an onsite renewable energy source, then you are reducing your emissions even further.



SIZE AND SCALE?

Heat pump systems come in all shapes and sizes, and can utilise all sorts of different heat sources. Whether you want to heat a single domestic property, or a 10ha glasshouse, there will more than likely be a solution that will fit your needs. The key to a successful heat pump system is that it is designed correctly for its requirements.

DO THEY WORK IN COLD WEATHER?

For 99% of British weather even air source heat pumps will work effectively. Ground source heat pumps will perform better in colder climates as ground temperatures are more stable. As mentioned above, if the system is designed correctly it will be able to provide adequate heat for space and water heating.

GOVERNMENT INCENTIVES AVAILABLE / FINANCIAL SAVINGS?

The RHI scheme has recently closed to new applicants. This scheme was introduced to help offset high installation costs of renewable heating technologies. As heat pump systems have been installed in the UK for around 10 years on this scheme, the installation costs have fallen, and will likely continue to fall making heat pump technology accessible for people without the RHI payments.

It is worth noting that although you will save by not paying for any heating fuel, your electricity use will rise as the heat pump is used. This should always be considered when a new system is being planned.

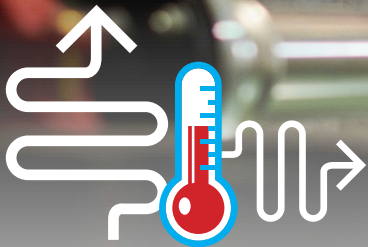
COSTS OF A SYSTEM

Ask an installer

MAINTENANCE

To ensure a system runs as efficiently as possible there will be a service schedule which should of course be followed. This will usually include changing filters, checking insulation, pump & motor checks, compressor checks and checking the coolant levels. Heat pumps have significantly less maintenance requirements than combustion plant.





Heat pumps FAQ's

1. What is the best heat pump system – air-source or ground-source?

This really depends on what heat requirement you have, and importantly the amount of space you have for an installation. Its worth weighing up both options and seeing which works best in terms of performance and cost for your requirements.

2. What is the 'Coefficient of performance' (CoP) of a heat pump?

This is the ratio of electricity consumed by the system, compared to the heat generated. The higher the CoP, the more heat produced, per unit of electricity used.

3. What is the environmental benefit of a heat pump?

The benefit is that we can avoid using fossil fuels to generate heat. The electricity in the UK grid is made up of a considerable amount of renewable electricity, and as such the emissions related to a unit of electricity are lower than that of burning a fossil fuel. As we install more renewables this will continue to reduce.

4. Are Heat Pumps Noisy?

No, heat pumps are not noisier than a boiler and many other appliances we use in our everyday life.

5. What maintenance is required for a heat pump?

Just like any heating system a routine maintenance schedule should be followed. This will usually be provided by the heat pump manufacturer or the installer and should be completed by a suitably experienced person.

6. Should I keep the existing, or have a back-up heating system installed?

Its often a good idea to keep an existing system in case of extreme weather, or if the heat pump is undergoing maintenance. For new installations where there is no existing heating, it is best to speak to your installer or designer for advice.

7. Are heat pumps expensive to operate?

Heat pumps use electricity to operate and as such you should expect your electricity bills to increase to cover this. You should review the ongoing electricity costs during the feasibility stage of your project.

8. Do I need a large outside area for a heat pump installation?

This depends on the type of heat pump system you plan to use. Ground source heat pumps can require a considerable area of land for the ground loop if a horizontal loop is used, or you can use a vertical loop similar to a borehole. Air source heat pumps are an option if space is limited.



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