

**Air source Heat Pumps (ASHPs) absorb heat from the outside air for use in radiators, underfloor or warm air heating systems and hot water in your home.**

**They use around a third less electricity for heating than other forms of electrical heating, delivering heat at lower temperatures over much longer hours than a conventional boiler, although if properly controlled it can switch on and off with the heating requirements of your home.**

#### How the technology works

The heat pump extracts heat from the outside air in the same way that a fridge extracts heat from its inside. Heat from the air is absorbed at low temperature into a fluid. This fluid then passes through a compressor where its temperature is increased, and transfers its higher temperature heat to the heating and hot water system.

Most ASHPs are sited just outside the property. An electrically-driven fan draws air across the evaporator, cooling the air stream and supplying heat to the heat pump. Below about 7°C, the outdoor section on some units may “frost up”. For this reason ASHPs always include a defrost cycle. A common defrosting method is to extract heat from the heat sink

(the house or hot water tank) and re-supply it to the evaporator to melt the ice – in effect, operating the heat pump in reverse.

ASHPs can also be used for cooling, removing the heat from the area to be cooled and converting it into useful heat in the form of hot water.

It is possible to take heat from the air when it is at temperatures as low as -20°C, so these systems can work all year round, although in cold weather they will have to work harder to move the same amount of heat indoors than on a mild day.

There is the possibility of corrosion of the ASHP when in close proximity to the sea so some manufacturers require the ASHP to be at least 1km away from the coast.

**You may be able to receive payments for the heat you generate through the government’s proposed Renewable Heat Incentive.**

#### Choosing your system

The heating requirement for most UK homes is around 6 to 8 kW. A normal-sized home built within the last decade should only require around 4-5 kW. For every 3kW of heat provided, an ASHP will consume around 1kW of electricity – this is known as the technology’s Coefficient of Performance (COP).

To obtain the maximum performance from a heat pump you should ideally use an underfloor heating system. This is because a building can often be heated with water at a flow temperature of as little as 35 to 40°C so some rooms may need larger radiators than those used with a gas or oil fuelled boiler.

**Operating heat pumps overnight on the off-peak electricity tariff is the most cost-effective way of providing space heating from a heat pump.**

#### TOP TIP

For a heat pump system to be cost effective, it is crucial that your home is well insulated. Contact Community Energy Plus for details of insulation offers in Cornwall and Devon.

Existing radiators can be used with a heat pump system but it is not ideal. The maximum flow temperature that most pumps provide is generally 50°C. If you are planning to use radiators then you will need to select a pump with a higher output than that recommended for underfloor heating.

#### Domestic Hot Water

It is possible to supply domestic hot water with an ASHP. The heat pump can be used to pre-heat water for an immersion heater to bring the temperature up.

#### Planning permission

Air source heat pump installations in England may be considered Permitted Development, so planning permission may not be necessary. Restrictions may apply to listed buildings and conservation areas. Contact your council’s planning department for advice relating to your individual circumstances.

## Cornwall's Independent Energy Experts

Our services to help householders in Cornwall and Devon enjoy warmer, energy efficient homes include:

- › Insulation and heating solutions
- › Energy efficiency advice and surveys
- › Planning for renewables services
- › Condensation and mould services
- › Help to understand and reduce energy bills

In certain circumstances we can access funding for services – call us to discuss your needs.



For advice  
call Freephone  
**0800 954 1956**

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COMMUNITY  
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A Simple Guide  
for Householders

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