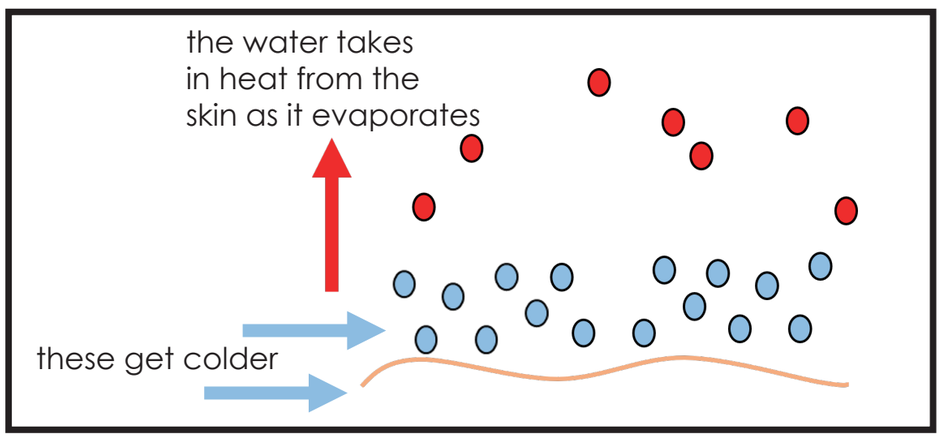
HEAT PUMPS

Reduces fossil fuel use

HOW HEAT PUMPS WORK

You need a lot of heat to turn water into steam. This is called a "change of state." As the water warms up it turns into a gas by **taking in** heat.

For example : water against the skin feels cold :



When water does the opposite and condenses, it **gives out** heat to the outside.

A heat pumps work like this - it pumps a liquid through a coil and draws in heat from the outside. Then the gas is compressed to make it turn back into a liquid and it gives heat to the inside of the house.

HEAT PUMPS

All heat pumps have :

- a heat exchanger outside

- a liquid which can turn into gas at the operating temperature and back into a liquid when compressed.

- an expansion valve which allows the liquid to expand and turn to a gas. This draws in heat from the outside.

- a compressor which aids the liquid liquifying and passing heat to the inside.

- an internal heat exchanger that transfers the energy to the house's heating system.

- may struggle to heat a poorly insulated house due to lower temperature of radiators
- needs capital investment

- efficient way of heating your home
- gives a constant background heat
- heats both the water and house
- reduces use of fossil fuels
- will work with exisiting water system but you may need to change radiators to larger ones

How do they work when it's cold outside?

Remember that everything above -273 C is "hot" and retains substantial heat in its mass. Heat pumps have no problems working in Scottish temperatures.

AIR SOURCE HEAT PUMP

Air source heat pump external fan, compressor and external coil.

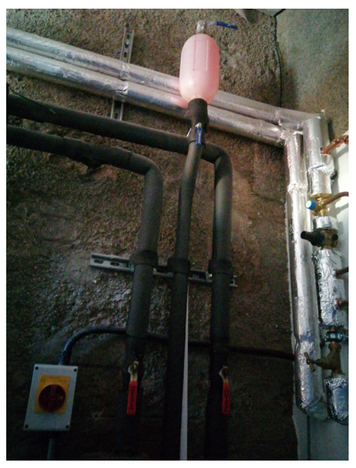
Takes heat from the air as the fan passes it over the coil.

Controller and heat exchanger (internal coil)

Low temperature (larger) radiator

GROUND SOURCE HEAT PUMP

Plant room



Bore hole supply pipes

Bore hole control

Bore hole control system

Some ground source heat pumps use coils laid out underground instead of a bore hole

Heat exchanger and store

Poster designed by Cromar Future Group and funded by NESCAN