# Buildings: Heat Pump Share

**This lever controls the sub-levers listed in the table, and ambition levels are for the end year shown on the right-hand side.**

Heat pumps work like a refrigerator in reverse. They pump heat from a cooler "source", such as air, water or the ground, to a warmer "sink" such as somebody's house. This is achieved through the use of a refrigerant which evaporates at the cooler, source side of the heat pump, absorbing heat. This fluid is compressed to high pressure and then condenses releasing heat to the sink. The fluid expands and is pumped back round to the evaporator. To do this electrical energy is required meaning heat pumps are a form of electrical heating. Heat pumps are capable of producing more units of heat than units of electricity they consume, therefore the efficiencies are greater than 100%. The efficiency of a heat pump is termed the coefficient of performance (COP). Air source heat pumps (ASHP) are easiest to install and are more suitable for individual home heating systems.

In the UK in 2015, there were around 140,000 heat pump units installed in the domestic sector[1], and 3.5 million in the non-domestic sector (mostly reversible air-source heat pumps)[2]. However, this represents only a small amount of the total domestic and non-domestic heat demand. Heat pumps are most suitable for buildings with good thermal performance. They can also provide a low-carbon heating alternative for off-gas grid homes. Heat Pumps are below District Heat in the priority order, if the total ambition for share exceeds 100%.

## Key Interaction

Low-carbon electricity must be generated to maximise emissions savings from electrified heating.

## Level 1

The heat pump market fails to grow and makes a negligible contribution to the UK's domestic and non-domestic heat demand.

## Level 2

20% of heat demand supplied by heat pumps.

## Level 3

40% of heat demand supplied by heat pumps.

## Level 4

Heat pumps are installed in all buildings that are suitable in terms of size and thermal performance, amounting to 90% of buildings.

[1] http://www.stats.ehpa.org/hp_sales/story_sales/

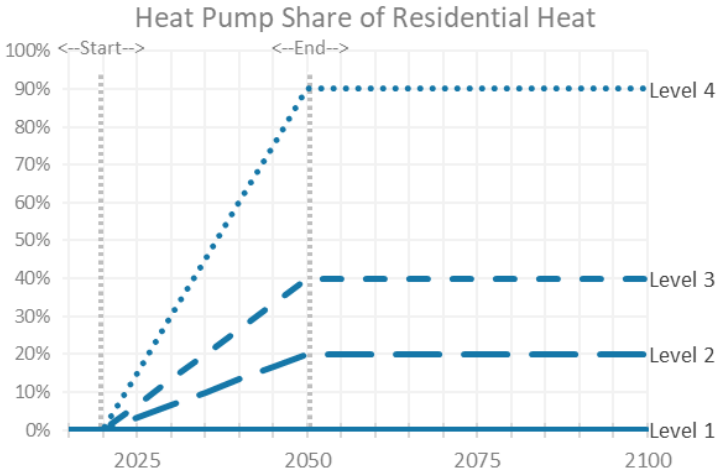
[2] https://www.gov.uk/government/publications/renewable-energy-from-reversible-air-to-air-heat-pumps

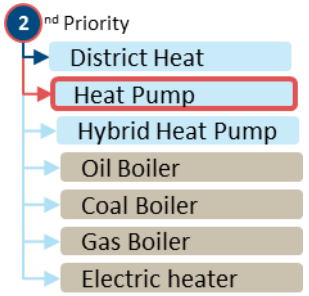
## Default Timing

Start year: 2020, End year: 2050

Heat Pump share of heat supplied

| Sub-Lever | Units | 2015 | Level 1 | Level 2 | Level 3 | Level 4 |
|---|---|---|---|---|---|---|
| Residential | share | 0% | 0% | 20% | 40% | 90% |
| Non-Residential | share | 0% | 0% | 20% | 40% | 90% |




## Lever Priority

Heat pumps are second in the priority order for supplying heat to buildings.

Where supply would otherwise exceed demand, measures lower in the priority order will be superseded by those above them.

Fossil fuel boilers and electric resistive heating meet any shortfall in demand.