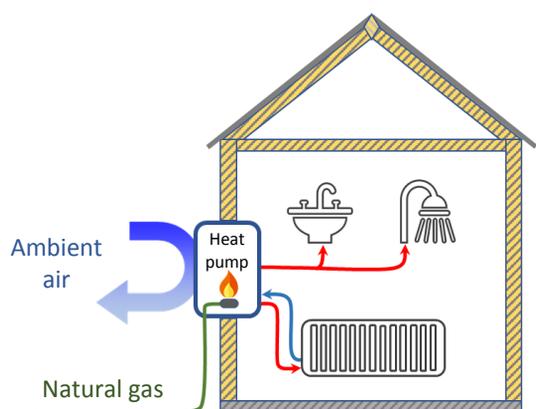
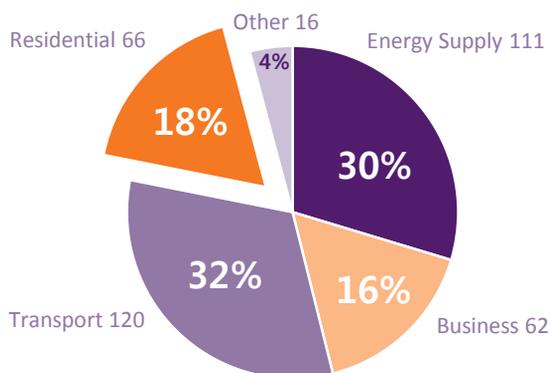


Gas Heat Pumps and the Future of Domestic Heating

CO₂ from Domestic Heating:

The UK total Greenhouse Gas (GHG) emissions in 2016 was 466Mt of which 374 Mt was CO₂ (BEIS 2017).

55 Mt of the emissions were from Domestic Gas Boilers amounting to 15% of UK CO₂ and 12% of total GHGs.



What is a Gas Heat Pump?

A heat pump uses energy (commonly electricity but in this case natural gas) to heat your house with more than 100% 'efficiency' by pulling in heat from the outside air or the ground.

Air source machines are easier to fit and have lower capital cost.

Gas heat pumps are designed as direct replacements for gas boilers, but have 30-40% less fuel consumption, running costs and emissions.

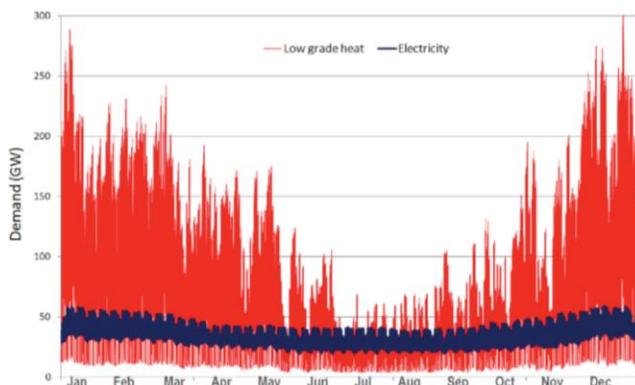
What about electric heat pumps?

The electrical grid wouldn't be able to cope with a complete move to electric heat pumps. The plot illustrates the scale of the problem – the required infrastructure upgrades would be vast.

BEIS and the energy industry expect that the gas grid will be around until at least 2050.

Electric heat pumps will be used more off the gas grid and in apartment blocks.

There will be a need for both gas and electric heat pumps for a long time. The exact mix will depend on the quantity and source of future zero carbon electricity – difficult to predict but both technologies are needed to ensure flexibility to adapt to an uncertain future.



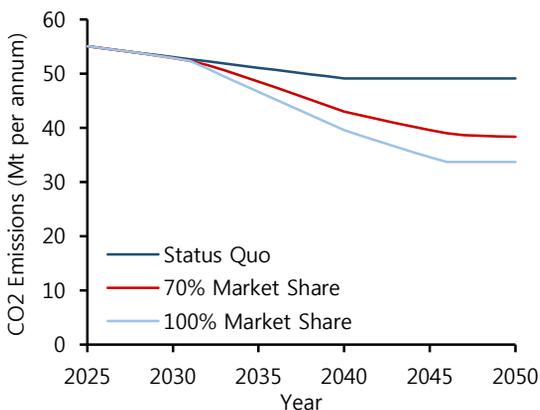
Products on / near market:



ROBUR K18: AIR SOURCE GAS HEAT PUMP.
Outdoor unit.
ErP Energy Class: A++



BOSCH WSW192i-18 / WLW192i-18
Air or ground source.
Indoor unit.
ErP Energy Class: A++



Market Scenarios:

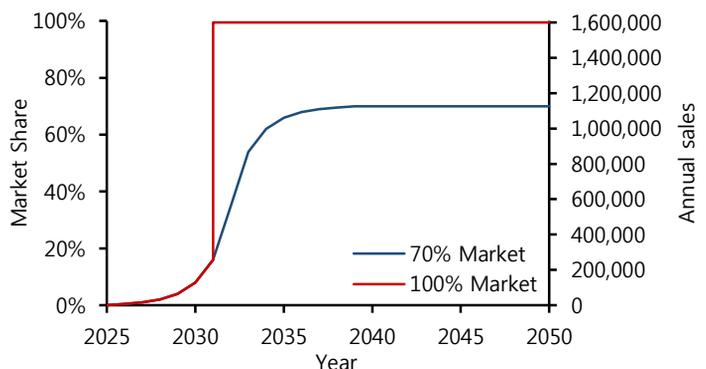
Two scenarios are considered:

- ▶ The first assumes that the market for Gas Heat Pumps will saturate at a 70% share of gas heating appliances annual sales after approximately 12 years (the rest of the market remaining as condensing boilers).
- ▶ The second assumes that after 7 years on the market, the cost of Gas Heat Pumps reaches the point where legislation requiring their use is introduced, in much the same way as was carried out for condensing boilers replacing non condensing boilers.

Effect on CO2 Emissions:

- ▶ A 2.6% reduction in UK annual CO₂ emissions by 2040 is possible.
- ▶ There is a potential for an eventual 4.2% reduction in annual CO₂ emissions if all gas boilers were replaced by gas heat pumps.

This is a major impact for just a single technology.



The School of Engineering of the University of Warwick is at the forefront of research in adsorption refrigeration, heat pumps and air conditioning.

We have expertise in the development of gas fired heat pumps for domestic boiler replacement in the UK.

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