Domestic and commercial heating choices

In 2007, 82% of homes were heated with gas boilers, 10% with electric heaters, and the remainder used oil, coal or biomass, heat pumps or community heating schemes. It is expected that the 26 million heating systems in existing homes and the systems in 14 million new homes will need to be replaced by 2050, so the options below outline the technologies they could be replaced with.

In 2007, 70% of commercial heating was from gas boilers, 20% from electric heaters and 10% from oil boilers with less than 1% from coal, biomass, heat pumps or community heating schemes. It is also expected that all commercial heating systems will need to be replaced by 2050, so these choices outline the technologies they could be replaced with.

The 2050 Calculator considers eleven technologies for heating buildings. Combinations of these can be chosen through two choices, one that mainly influences the level of electric heating and the other that influences what is used when electric heating is not used. The table to the right indicates which technologies are covered by each choice.

Types of technology which could be used to supply the UK's building heat in 2050 include:

- **Conventional gas boilers**, assumed to be capable of using either biogas or natural gas. (Their use is maximised by choosing A for electrification and A for the other heating choice).
- **Solid fuel boilers**, assumed to be capable of using either coal or biomass. (Maximised by choosing A for electrification and A for the other heating choice).
- Electrification via the installation of **resistive heating technologies, ground-source and air-source heat pumps**. (Maximised by choosing D for electrification and D for the other heating choice).
- Home heating technologies, designed to produce electricity while they are producing heat, e.g. **micro-Combined Heat and Power** (µCHP). (Maximised by choosing B for electrification and A for the other heating choice).
- Piped-in heat, for example **district heating** that takes steam or hot water from large power stations (Maximised by choosing A for electrification and C for the other heating choice), or from community scale gas or solid-fuel CHP systems (Maximised by choosing B for electrification and C for the other heating choice).

Electrification choice A	Other heating choice	Gas boiler	Solid-fuel boiler	Resistive heating	Air-source heat pump	Ground-source heat pump	Stirling engine µCHP	Fuel-cell µCHP	Community scale gas CHP	Community scale solid-fuel CHP	Geothermal	District heating from power stations
A	A	90%		10%								
	B		24%				5%			63%	1%	7%
	C		19%				10%		24%	35%	1%	11%
	D		19%				10%		30%	33%	1%	7%
B	A			10%				90%				
	B		10%			20%				70%		
	C				14%	20%	15%		15%	25%		11%
	D					25%	5%	16%	23%	23%	1%	7%
C	A		10%			30%		20%	33%			7%
	B				18%	30%				45%		7%
	C				58%	30%					1%	11%
	D				25%	25%	10%		13%	20%		7%
D	A				55%	30%			15%			
	B				50%	30%				20%		
	C			7%	60%	30%						3%
	D			10%	60%	30%						

Table 1. There is a large existing stock of heating systems dominated by gas. Every year heating systems are replaced, and the table above shows the split by technology of those new heating systems.