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Part 1: Home renewable technologies

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Renewable energy technologies and energy efficiency measures have become increasingly mainstream over the past few years, meaning they have become more accessible to the average homeowner. The advent of government-backed incentives, grants and funding schemes (see Part 3) has also put these technologies within reach of many people for the first time. This trend is likely to continue as the technologies become more refined, widespread and affordable.

As well as helping people to save money on energy bills in the long term, each of the following technologies has a vital part to play in mitigating the catastrophic effects of climate change as the UK moves towards a net-zero carbon future.

Heating systems

Electricity

Heating and electricity

Micro-combined heat and power

Although they use fossil fuels in the form of mains-supplied gas, micro-combined heat and power (micro-CHP) systems are considered a low-carbon technology because of the efficiency that results from providing both heat and power simultaneously. Some systems can be supplied by biomass fuels, further improving their eco-friendly credentials. For mains-supplied systems, the installation process and space requirements are similar to those of traditional household boilers, so they require relatively little upheaval for the homeowner. When running at full efficiency, domestic micro-CHP systems supply heat and electricity at a ratio of about 6:1 – so their heat output is always greater than the electricity they produce. There are three main types of micro-CHP: internal combustion systems, which tend to be larger and noisier and are therefore mainly used in industrial settings; external combustion, or Stirling engine systems, which are quieter but less efficient; and fuel cell CHP systems, which use a chemical process to create electricity from fuel, and emit heat energy as a by-product.

Energy efficiency

Insulation

Home insulation is an important way of ensuring that domestic buildings maximise their energy efficiency and minimise waste. Cavity wall insulation can be used in a building's internal walls to fill empty space and prevent the convection of warm air between rooms. This usually consists of a fibrous material such as mineral wool or polyurethane spray foam, which can be pumped into cavities through holes drilled in existing walls. This spray foam expands to fill any gaps and inhibits heat transfer. Similar materials can be used in loft and roof cavity spaces for the same purpose. In addition to insulation inside the home, external wall insulation can be applied to the outside of buildings in the form of cladding, usually consisting of expanded polystyrene or polyurethane, and then finished with an additional layer of cement or synthetic finish. Homes that have been properly insulated are likely to see far lower energy bills than their non-insulated neighbours.

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