

Low carbon, energy efficient alternatives to open coal fires

Using coal releases huge amounts of carbon dioxide. A piece of high quality coal is around 75% carbon. This problem is made worse as a significant amount of the heat produced in an open fire, escapes up the chimney. It has been estimated that up to 85% of the heat produced in an open fire is lost up the chimney. Even when there is no fire being used, considerable amounts of heat in the home is lost via the open chimney.

Wood stoves

Wood stoves have become an increasingly popular alternative to open fires and to supplement the main home heating system. Stoves can be more efficient than open fires because less heat escapes up the chimney both when the stove is on and when it is not in use. Wood stoves and ranges are available with outputs from 5 to 20kW and can be used to heat a single room or domestic hot water and central heating.

Wood chip and pellet boilers

Efficient, reliable wood chip and pellet boilers provide heat for a very wide range of uses, from homes to commercial and industrial applications.

Most systems are 'wet', i.e. they deliver hot water and central heating via radiators, but warm air systems (suitable for heating large spaces, like factories) are also available.

Wood fuel boilers typically work best under a relatively constant load. So, to maximise efficiency, it may be worth fitting a wood fuel boiler that provides, say, 80% of the annual energy, with a back-up boiler (either another wood fuel boiler or small gas/oil boiler) to kick-in when the heat load peaks. Accumulator tanks can also help with fluctuating loads.

Wood fuel boilers use different types of technology, usually classified by the type of grate used. The main types of automated boiler use either a moving grate, a plane grate or a stoker-burner. The Carbon Trust's biomass heating guide (pages 38 – 41) details the advantages and disadvantages of each type of boiler.

Log Boilers

Modern log boilers can provide clean and efficient heating to all domestic-sized situations and for heating larger spaces such as village halls with a heat output need

of up to 70-80 kW. Larger boilers are available but require a considerable amount of stoking.

Log boilers need to be stoked only once or twice each day. They operate at high levels of efficiency and have large combustion chambers. Some boiler models can take large logs up to a metre long, which reduces the work of sawing. Stoking should take no more than five to ten minutes each day.

Heat is produced in a log boiler relatively quickly and is used to heat water up to around 90 degrees C. The heated water is stored in a highly insulated tank called an accumulator tank. This can be used to deliver both central heating and domestic hot water to the house for the rest of the day, in a programmable way.

The accumulator tank can be integrated into a system with different heat sources. For example, the water could be pre-warmed by solar panels, or come from other wood burning stoves or a kitchen range, an electric immersion heater, or an oil fired boiler which could also provide a back-up heating system.

Permanently blocking up chimney

If you do not plan to use a fire, the best option would be to board up the chimney area completely. The way to do this would be having a board fixed with sealant to avoid draughts. You would need to have a small ventilator at the bottom of the board to allow for enough ventilation.