



# Info Sheet

## Heating Systems

### Boiler replacement

Over half of a typical household's energy bill is for fuel for the boiler so installing an efficient boiler is an essential part of minimising your energy spend. Over the last ten years development of boiler technology has significantly improved their efficiency. Also, as boilers age they become less efficient at producing hot water. The result is an old boiler uses more gas than necessary to generate the same amount of heat.

Replacing an old boiler like-for-like with a modern, A-rated condensing gas boiler can typically save from £100-£300 per year, depending on the efficiency of the boiler it is replacing<sup>1</sup>. Modern condensing boilers recover much of the heat which is normally vented through the flue to the outside by a non-condensing boiler. Larger heat exchangers recover heat from the condensing exhaust vapour.



### Types of domestic heating system

Most old gas and oil boilers are 'regular' boilers: they provide heat to radiators/underfloor heating system and have a separate hot water cylinder to store hot water, rather than providing it directly from the boiler. When you replace your boiler you have a choice of buying a new regular boiler (and keeping your hot water cylinder) or alternatively installing a combi boiler which provides heating and hot water instantaneously and therefore doesn't need a cylinder.

### Some considerations when considering heating systems

- Fuel type is important: you may wish to consider replacing oil, LPG or coal fired boilers by installing a gas supply and gas-fired boiler for a longer term efficiency saving (if the upfront cost is not too great). Mains gas is generally the most cost-effective fuel from which to run a boiler
- Similarly, if your house is equipped with electric storage heaters only, it may well be cost-effective in the long run to install a complete gas-fired central heating system
- Biomass burning boilers are also available, burning wood pellets etc. but these are not suitable for all locations or applications. Your installer can advise on this.
- Upgrading a hot water cylinder for a more efficient alternative can also yield significant savings, by reducing the standing losses from your hot water tank



Conventional boilers



Storage cylinder

<sup>1</sup> Source of figures: Energy Saving Trust



- For smaller houses, with fewer occupants, and for those only occupied sporadically, a combination 'combi' boiler may be more suitable than a system with hot water storage (as it supplies hot water instantaneously and there are no heat losses associated with storing unnecessary/unused hot water which is left to cool). They also take up less space but are not compatible with some other systems such as solar water heating systems.

### Heating control systems

Irrespective of your heating system, the right heating controls will let you keep your home at a comfortable temperature without wasting fuel or heat. Your full set of controls should ideally include a timer or programmer, a room thermostat, thermostatic radiator valves (TRVs), a boiler thermostat, a cylinder thermostat and, where feasible, zone control.



Combi boiler

#### 1 Programmable timer and room thermostat

To more easily control the operation of your heating and hot water system, a programmable timer should be fitted to your boiler. This allows the operating times of the boiler to be set, to match the usage patterns of the house. The time when the heating system operates and the desired room temperature can be programmed together so that you can vary the temperature of the house during the day to suit your needs.

A room thermostat should be installed to prevent your home getting warmer than it needs. The temperature can be set manually to your desired temperature. The thermostat will then turn off the heating system when the temperature is achieved and switch it back on when it falls too low.

#### 2 Thermostatic Radiator Valves (TRVs)

TRVs should be fitted to every radiator that serves a room without an independent thermostat. They can be individually set by adjusting the rotary dial on them, anywhere between 'Off' (where no hot water flows to the radiator) to 'Maximum'. Hot water is then only delivered to those rooms which require heating.

This control is secondary to the main boiler thermostat and timer control, and so radiators will only heat up when the main system is on. You can adjust each TRV individually to achieve your desired room temperatures. They should also be adjusted throughout the year if the use of a room changes (i.e. a bedroom becomes a store room which doesn't require heating).

#### 3 Boiler thermostat and interlock

To control the temperature of the water supplied by your boiler, a boiler thermostat should be installed. This control sets the temperature of the water that will be pumped from the boiler through the radiators to heat your home. The higher this is set, the quicker and more effectively the system will heat your home. A boiler interlock should also be installed which switches off the boiler when neither the room thermostat nor the hot water cylinder requires hot water.



#### **4 Cylinder thermostat**

To control (and limit) the temperature of the water in a hot water cylinder, a thermostat should be installed. Once the water in the cylinder reaches the desired temperature, the thermostat ensures that the boiler switches off and stops supplying excess heated water. A well-insulated tank can then hold the water for several hours for use in the home.

#### **5 Zone control**

Typically there will be a single heating zone which covers your whole house. However, where there are multiple zones, individual zone controls should be installed to operate each one independently. This would typically consist of an additional programmable timer and thermostat and TRVs on the corresponding radiators.

#### **Costs**

The cost of replacing / installing a heating system typically range from £2500 to £5,000 or more if mains gas needs to be brought into the property. A technical survey and specific quotation is needed to be more specific. Your Green Deal assessment will indicate the likely energy cost savings that would be likely for your property as an average saving is not particularly helpful as this is very property / current heating specific.

Upgrading an old hot water cylinder can save a further £45 per year. A combination of effective control systems will generate further savings on top of these.

#### **Rules and regulations**

Registered heating installers must be used, and all boilers and documentation provided must be installed in line with Building Regulations.

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