

CUTTING ENERGY USE: THE 'FABRIC FIRST' PRINCIPLE

What is the 'Fabric First' principle?

The warmth created by your heating system – and the energy used – will be quickly lost through any uninsulated areas. Tackling these first will make your home noticeably warmer and lower your bills.

Making improvements to the fabric of your home – that is the walls, floors, roof and windows – is widely acknowledged to be the best place to start if you are trying to reduce your energy use.

Here are the main ways you can make improvements:

1. Add wall insulation

Uninsulated homes lose more than a third of their heat through the walls. A detached house loses heat through the walls on every side, as they are all exposed to the outside air, whereas a mid-terraced house or flat has fewer external walls so experiences less heat loss.

Check what type of walls you have. You need to know how your walls are built because the methods of insulating each type are quite different. The age of your home can give you an idea of the type of wall construction.

Most homes more than 100 years old have solid walls, usually brick or stone. Internal and external solid wall insulation systems are available.

Homes built after 1920 are likely to have cavity walls, comprised of two walls with an air gap (the cavity) in between.

Modern homes built after 1990 normally have insulated cavity walls, and shouldn't need to be upgraded.

2. Add floor insulation

Up to 15% of lost heat goes through the ground floor of your home, so it should be insulated if possible. It's not normally needed for upper floors, but if you have a room above an unheated space, such as a garage, insulation may be beneficial.

Check what type of floors you have. Like walls, you need to know what type of floors you have to choose the right sort of insulation.

Suspended floors, usually floorboards, rest on joists above a void space. They can be insulated using rigid boards, mineral wool, or spray foam insulation.

Solid floors are generally stone or concrete. A layer of rigid insulation can be laid on top.

Many homes have both types of floor so you may need more than one approach.

3. Add roof and loft insulation

Insulating a roof or loft is one of the most cost-effective ways to improve your home's energy efficiency. Large detached houses and bungalows lose a large proportion of their heat through the roof, but most homes can benefit from a minimum of 270mm of loft insulation.

What type of roof do you have? Most roofs can be insulated, but there are different methods.

Pitched roofs can be insulated at joist level as a cold roof, often called loft insulation, or at rafter level as a warm roof. Insulation rolls, rigid boards, and spray foam applications are all available.

Flat roofs can be insulated as a warm deck, cold deck, or inverted roof.

4. Upgrade windows and doors

If you have single-glazing, replacing it with more energy-efficient windows will make your home warmer and quieter. Not every home can install replacement windows, but there are other options.



Double glazing is the most common type, made up of two panes of glass with a sealed gap between, filled with air or an inert gas.

Triple glazing is made up of three panes of glass with two gaps, and can be more effective than double glazing.

Secondary glazing is not a replacement, but is added to existing windows to improve heat retention. It can be a good choice for rented properties, listed buildings and homes in conservation areas.

5. Add hot water cylinder and pipe insulation

Your boiler works hard to heat water for taps and radiators, but a lot of that heat can be lost through an uninsulated water tank and distribution pipes. Boilers that make their own hot water (called a combi-boiler) do not have a hot water tank, but older boilers might do. Insulating your hot water tank alone is likely to pay for itself in just one year and is very easy to do.

Fit a cylinder jacket. They are cheap to buy and easy to fit, but make sure it's at least 80mm (3 inches) thick.

Insulate all accessible hot water pipes using off-the-shelf foam tube.

Add reflective panels behind radiators to prevent heat from being lost through external walls. They are especially effective for radiators on uninsulated solid walls.

6. Draught-proofing

Although controlled ventilation is important to prevent damp and condensation, uncontrolled draughts waste heat and energy. DIY draught proofing is easy using off-the-shelf products to seal around doors and windows, and ready-made products are also available to draught proof keyholes and letterboxes.

Remember your granny and her “sausage dogs” under the draughty door, they would still work and stop draughts.

Heat starts to escape when the sun goes down. Draw curtains or close blinds to keep the warmth in – especially if you have older windows.

7. Energy efficient lighting

Although lighting may seem a minor part of your home's energy use, swapping old light bulbs for low-energy LEDs is a quick DIY job and makes quick savings to your energy bills.

LED bulbs use around 90% less energy and can last up to fifteen times as long.

8. Heating and Radiator Controls

A boiler has a controller which can set when and how long a boiler operates. There will be separate settings for hot water and the central heating.

Thermostatic radiator valves (TRV's) can give you greater control over the temperature of your home than manual valves. This is because you set the valve to your desired room temperature. Many homes already have these.

TRV's have numbers or symbols to represent how much heat the radiator is putting out.

Normally, these numbers range from 1 – 6. Turning the valve to 3 should give you a room temperature around 20°C. Each number above or below then represents a single degree. So a 2 is around 16°C while a 4 is approximately 24°C.

This numbered system is used, rather than exact temperatures, as an exact room temperature can't be guaranteed. This will be affected by the level of insulation, if the radiator is by a window and how well your boiler is performing.

It's a good idea to pay attention to your radiator valve settings as you may not need maximum heat in all your rooms (you may prefer a cooler bedroom but a warmer bathroom).

In addition, heating rooms which are rarely used is a waste of energy. And when it comes to keeping heating bills low, remember that for each degree below 20°C, you can save as much as 6% in energy use. Level 1 is often referred to as “Frost Protection” so it would only heat this room to keep it above freezing level e.g. above 0 degrees, rather than heating it to a comfortable 16°C plus.

