The hot guide to

Heating your home efficiently

ACT ON CO2

Save up to a third off your heating bill

energy saving trust®

Here to help everyone save energy in the home.

Are you heating your home as efficiently as possible?

It shouldn't be hard work keeping your home nice and warm and your hot water hot. But if your boiler is more than 15 years old, it's probably not as efficient as it could be.

So, is it time you thought about a new heating system?
Around 60% of carbon dioxide (CO_2) emissions from your home are down to your boiler. With a new A-rated condensing boiler and a full set of heating controls. you could save up to £300 and 1,500 kg of CO_2 per year.

Yes, that's money and energy all saved in one household purchase. And remember: by saving energy, you'll be helping to fight climate change at the same time.

How cool is that?
Before you buy a new boiler ensure your home is properly insulated. Insulating your home (insulating your loft, walls and floors and draught proofing your doors and windows) means that you need less energy to heat it and therefore you will need a smaller boiler. You may be eligible for a grant or offer to help with the costs of insulation. To find out more call **0800 512 012**.

Hot tip
If you're planning building work on your home or making major improvements, there's no better time to replace an inefficient boiler.

What's the right boiler for your home?

The SEDBUK scheme rates boilers from A to G according to their level of energy efficiency. SEDBUK stands for Seasonal Efficiency of Domestic Boilers in the UK.

Exceptional circumstances aside, all new gas and oil central heating boilers fitted in the UK must now be 'high efficiency' (A or B SEDBUK rated) boilers, which in most cases means fitting a condensing boiler. For more information, see **sedbuk.com**

A registered installer will help you to buy an appropriate boiler for your home. But first, here's a little background on boilers: what's hot and what's not…

What's so good about condensing boilers?
Condensing boilers can be easily fitted to most new and old heating systems. What makes them better than older, non-condensing boilers is their efficiency: they use far less energy to produce the same amount of heat.

While old non-condensing boilers convert around 65% of their fuel into heat (SEDBUK G-rated boilers), the efficiency rate of modern SEDBUK A-rated condensing boilers is at least 90%.

An A-rated condensing boiler will use nearly 30% less fuel than an old boiler to provide the same amount of heat – with a full set of heating controls too, this could cut heating bills and CO_2 emissions by up to a third.

What sort of boiler do you have at the moment?
A flue is the pipe that takes the exhaust gases generated by your boiler and passes them out through the wall or roof – letting them escape into the air. The end of the flue is covered by a metal or plastic protective cover, which makes sure that a good flow of air is maintained.

If the flue is made of plastic and lets out visible water vapour when the boiler is firing, then congratulations: you are likely to have a condensing boiler already.

If the flue is made of metal and no water vapour is visible, you are likely to have a non-condensing boiler. These older boilers let out much hotter gases that are invisible to the naked eye – and would melt a plastic flue.

To be certain whether you have a condensing boiler, ask your installer or you can visit the SEDBUK website at **sedbuk.com** and search

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for the make and model of your boiler.

How does a condensing boiler work?

A condensing boiler captures much more usable heat from its fuel than a non-condensing boiler. They extract heat from the exhaust gases that would otherwise escape through the flue – turning water vapour from the gas back into liquid water or condensate.

Its high operating efficiency is made possible by the design of the condensing boiler's larger – or sometimes dual – heat exchanger. The heat exchanger makes sure that as much heat as possible is transferred from the boiler's burner – and as little as possible lost in gases through the flue.

There are two types of condensing boiler: regular and combination. Regular condensing boilers heat your hot water and the water is then stored in a hot water cylinder. Combination condensing boilers give you instant hot water without the need for a cylinder.

Please bear in mind that not all home heating systems will be compatible with a combination boiler. Your installer will tell you which type of condensing boiler, regular or combination, is most suitable for your home.

Hot fact

If everyone in the UK with gas central heating installed a condensing boiler, we would save enough energy to heat 3.4 million homes for a whole year and save nearly 13 billion kg CO_2 a year.

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How should you go about buying a boiler?

Your first step should be to get at least three quotes. One of the best ways to find a reliable installer is to ask around – and get a personal recommendation from a trusted friend or relative.

To make sure you're complying with Gas Safety Regulations, you should always use a Gas Safe registered engineer. In Great Britain, all work on gas applicances must be carried out by an engineer on the Gas Safe register which replaced the CORGI* gas register in Great Britain on 1st April 2009.

We strongly recommend that any boiler or heating systems are fitted by an installer who is registered with a Competent Person Scheme. Competent Person Schemes were introduced by the government to allow individuals and businesses to self-certify their work as compliant with UK Building Regulations. Most installation or upgrade work done on your heating system is subject to Building Regulations. These regulations vary depending on where you are in the UK, but generally all work must be notified to your local authority.

Competent Person Scheme installers can self-certify their work as compliant with Building Regulations. They can also notify the local authority on your behalf and issue you with a certificate on completion which can be used as proof of compliance for the Home Information Pack (HIP). It will also show up on a solicitor's Local Authority search when you sell your home.

If you don't use an installer registered with a Competent Person Scheme then you will have to submit a building notice or full plans application and pay a fee to have Building Control come and inspect the work you have carried out.

To find an installer registered with a Competent Person Scheme, visit **competentperson.co.uk** and enter your postcode or the name of the installer in the relevant search box.

Please also see below a list of Competent Person Scheme operators for home heating and hot water systems and associated electrical work:

- Building Engineering Services Competence Accreditation (BESCA)
- National Association for Professional Inspectors and Testers (NAPIT)
- National Inspection Council for Electrical Installation Contracting (NICEIC)
- Oil Firing Technical Association (OFTEC)
- Heating Equipment Testing and Approval Scheme (HETAS)
- Council for Registered Gas Installers (CORGI)
- Gas Safe register
- Electrical Contractors' Association (ELECSA)

*CORGI will continue to operate in Northern Ireland, Jersey and Guernsey.

Other checks you can make about installers include asking:

- Does the installer have a local office?
- Has he/she been in business locally for several years?
- Are customer references available that you can check?

Your local council may also be able to help with a list of qualified installers.

Looking after your central heating system

When your new boiler is being installed or serviced, your installer should also need to clean and flush your central heating system, and add a chemical inhibitor which helps to reduce lime scaling and corrosion. This will remove any limescale or sludge in your heating system, ensuring your heating continues to work as efficiently as possible.

There are three main treatments which can be used:

- Flushing: This will either involve a 'powerflush', or a mains pressure water flush (which will take longer).
- Inhibitors: Chemical inhibitors can be added to the system which help prevent build up of lime-scale and help prevent corrosion.
- Water softeners: If a combination boiler is installed in a hard water area, water softeners can be added to the system.

Powerflushing is the most thorough and effective way to cleanse existing systems – and hot flushing is more effective than cold flushing. But the method your installer uses depends on your make of boiler, as does the type of cleanser. Your installer should always check and stick to the manufacturer's instructions.

Any maintenance work on your boiler in years to come should also be carried out by an Gas Safe or CORGI installer (CORGI will continue to operate in Northern Ireland, Jersey and Guernsey). Your installer will also be able to tell you when you need to get your boiler serviced.

Your boiler should usually be serviced once a year by an installer. When your boiler is serviced, you should check that the system is clean; this will ensure your heating system continues to work as efficiently as possible.

A system may benefit from cleaning:

- If a system is 'cold-spotting' – where the radiators do not provide uniform heat and feel cold to the touch in patches.
- When the system pump can be heard 'labouring' – because the system is pumping round not just water, but also the build up of sludge or lime scale.

Please remember to keep any boiler-related certificates in a safe place. You'll need them when you sell your home.

Is your heating under control?

When it comes to heating your home efficiently – wasting as little fuel and heat as possible – then a full set of heating controls is just as essential as the right kind of boiler.

Using heating controls correctly is the easiest way to keep your rooms at a comfortable temperature. And at the same time they'll help to reduce your household's fuel bills and CO_2 emissions.

Heating controls allow you to choose when the heating is on, how warm it is, and where you want the warmth. They will also make sure that the boiler is only turned on when it needs to be.

You could save up to a third off your heating bill by replacing your old boiler with a new A-rated condensing boiler and a full set of heating controls – that's up to £300 in a typical 3 bed semi detached home.

What makes a full set of heating controls?

A properly controlled heating system should typically have:

- A time programmer.
- A room thermostat.

OR:

- A combined programmable room thermostat – instead of a separate programmer and room thermostat.

PLUS:

- A cylinder thermostat - if your hot water is provided via a hot water storage cylinder.
- Thermostatic radiator valves (TRVs).

Are you making the most of your heating controls?

You may already have a full set of heating controls in your home – but are you getting the best from them?

Take a little time to find out what each control does using our quick guide below, and you could save money and valuable energy. If you do have any of these controls already, refer to the instruction manuals that came with them, for specific advice on your particular make(s) and model(s).

If you don't have any manuals to hand, copies can usually be downloaded from manufacturers' websites.

What is a programmer?

Programmers allow you to set when the heating and hot water come on and go off again. By installing a programmer, and heating your home and hot water only as and when necessary, you will save energy and money.

What is a room thermostat?

A room thermostat constantly measures the air temperature of a space and can be set to whatever temperature suits you best, usually between 18 and 21°C.

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They are usually installed in hallways or main living areas to sense the average temperature of a home's main living spaces. When the temperature falls below the setting, the thermostat switches on the central heating; once the room reaches the set temperature, the thermostat switches the heating off. Please note that the heating needs to be switched on for the thermostat to work.

What is a programmable room thermostat?

A programmable room thermostat lets you choose the times you want your home to be heated and the temperature you want it to reach. In other words, it allows you to heat rooms or the whole house to different temperatures at appropriate times of the day and week. And again, by heating your home and hot water only as and when necessary, it can save energy and money too.

What is a cylinder thermostat?

A cylinder thermostat keeps a constant check on the temperature of the water in a hot water cylinder. It switches the heat supply from the boiler on and off as necessary to keep the water at a set temperature. Installing a cylinder thermostat could save you around £20 and 110kg of CO_2 a year.

What are thermostatic radiator valves (TRVs)?

TRVs sense the air temperature around them and regulate the flow of hot water entering the radiators to keep a set temperature in a room. They can help you save money and energy, by allowing you to set lower temperatures in some rooms than in others, and to turn off the heating in rooms that aren't used. By installing TRVs, you could save up to £10 a year and around 45kg of CO_2 a year.

In the majority of cases TRVs can not turn the boiler off when the whole house has reached the right temperature(s). To do that, you will need a room thermostat as well. Radiators in the space containing the room thermostat should not normally have TRVs. But if they do, you should keep the TRVs on their highest possible settings, and set the room thermostat to the required temperature instead.

Hot advice

Programmable thermostats, room thermostats and TRVs all need a free flow of air to be able to sense and measure the temperature around them. So, they must never be covered by curtains or blocked by furniture. Nearby electric fires, televisions and wall or table lamps could also stop them working properly.

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Hot tips

- Set your thermostat at the lowest comfortable temperature – typically between 18°C and 21°C. Lowering your thermostat by just 1°C could save you around £65 a year.
- Your hot water cylinder thermostat should be set at 60°C or 140°F. Any higher is a waste of energy and can lead to scalding; any lower and there may be risks of legionella.
- 'Bleed' radiators from time to time to remove unwanted air from your heating system and keep your radiators working at their maximum output.
- If your tank is not insulated, fit a BS Kitemarked insulating jacket, 75mm or 3 inches thick, around your hot water tank. It will save you around £40 a year – and as it will only cost around £12 to buy, will pay for itself in well under a year. You can also put a second hot water jacket on your tank if the current jacket is below the recommended thickness.
- Insulate your central heating and hot water pipes – especially those between your boiler and hot water cylinder – to save an extra £12 a year. This is best done when you have access to pipes – for example when pipes are exposed during renovation work.
- Close your curtains at dusk to reduce the amount of heat escaping through your windows.

Look for the logo

The Energy Saving Recommended logo makes it easy to spot the most energy efficient products on the market.

So, when you're having a new boiler fitted, remember to ask your installer for an Energy Saving Recommended model.

The same goes for heating controls: always look for the distinctive Energy Saving Recommended logo on any controls that you buy or have installed.

If a boiler or heating controls carry the logo, you can be sure they've met the strict energy efficiency standards set by the Energy Saving Trust.

All Energy Saving Recommended boilers have to be SEDBUK A-rated. SEDBUK stands for Seasonal Efficiency of Domestic Boilers in the UK. A boiler's SEDBUK rating tells you how efficient it will be over the year in typical home conditions – with A being the best possible score. To find out more, visit the SEDBUK website at **sedbuk.com**

For heating controls, the Energy Saving Recommended scheme specifies that the system must comply with Building Regulations Part L1. Part L sets standards on the conservation of energy in our homes, offices and other buildings. In addition, Energy Saving Recommended heating controls must come with instructions approved by the Plain English Campaign. In other words, each control's instruction booklet must explain simply and concisely how to get the best from the product.

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What about renewable energy sources?

Did you know that you can use natural – or renewable – energy sources like heat from the sun or wood to heat your home and water? There are four main options suitable for home use.

Ground source heat pumps take natural heat from the ground and convert it into energy to heat buildings. Lengths of coiled pipe buried underground containing water and antifreeze are used to extract this natural stored energy which can then be used to heat rooms and, in some cases, water as well. A typical system could contribute much of the energy needed for a well insulated home. Replacing an oil boiler with a ground source heat pump could reduce your heating and hot water bills by as much as £570 and around 1,300kg of CO_2 per year. (Savings will vary, depending on the fuel being replaced).

Air source heat pumps absorb heat from the outside air to heat your home and hot water. They do not require the use or storage of external fuel, and they run on electricity, which eliminates the need for a gas connection or storage of oil/solid fuel. Replacing an oil boiler with an air source heat pump could reduce your heating bills by as much as £420 a year and reduce CO_2 emissions by around 8,300kg per year. (Savings will vary, depending on the fuel being replaced).

Biomass is made up of plants and untreated wood or wood waste. With a special biomass boiler, this fuel can be a cost-effective way to heat a home. Replacing an oil boiler with a biomass boiler could save around £180 a year on heating bills and cut CO_2 emissions by 3,900kg a year. Above all, biomass is considered a carbon neutral fuel. Although the fuel produces CO_2 when it is burnt, this is balanced out by the amount of CO_2 the plants absorb in their lifetime.

Solar water heating uses heat from the sun to work alongside your conventional water heater. It works via solar collectors on the roof, which soak up the sun's energy, then transfer it to the hot water cylinder – warming it up throughout the day. Solar water heating with south facing roofs and gas heating could take care of around a third of your hot water needs, and save around £65 a year in energy bills – cutting your CO_2 emissions by up to 325kg a year, savings will be higher when replacing other fuels.

Hot tip
To find out more about renewable energy technologies, accredited installers and any grants that may be available call 0800 512 012 or visit our website at energysavingtrust.org.uk/renewables

What else would you like to know?

"So, how much energy and money could I really save with a better home heating system?"
By fitting an A-rated condensing boiler with a full set of heating controls you could save up to £300 a year and 1,500 kg of CO_2.

"Are condensing combi-boilers more efficient than regular condensing boilers?"
Not always – well designed hot water storage systems can match the efficiency of a combi. It is important to match your choice of system to your hot water needs. In general, combination boilers are most suitable for smaller homes. If you use small amounts of hot water often it may be inefficient to heat a whole tank of water each time and a combi boiler may better suit your needs. A registered installer can let you know which is most suitable.

"Are condensing boilers over-complicated and unreliable?"
In a word, no. The main difference between non-condensing boilers and condensing boilers is the design of the larger heat exchanger in the latter. Another difference is the condensing process itself: when the flue gases cool, water condenses inside the boiler and needs to be drained away. But this shouldn't cause any problems if the boiler is fitted properly by a registered installer.

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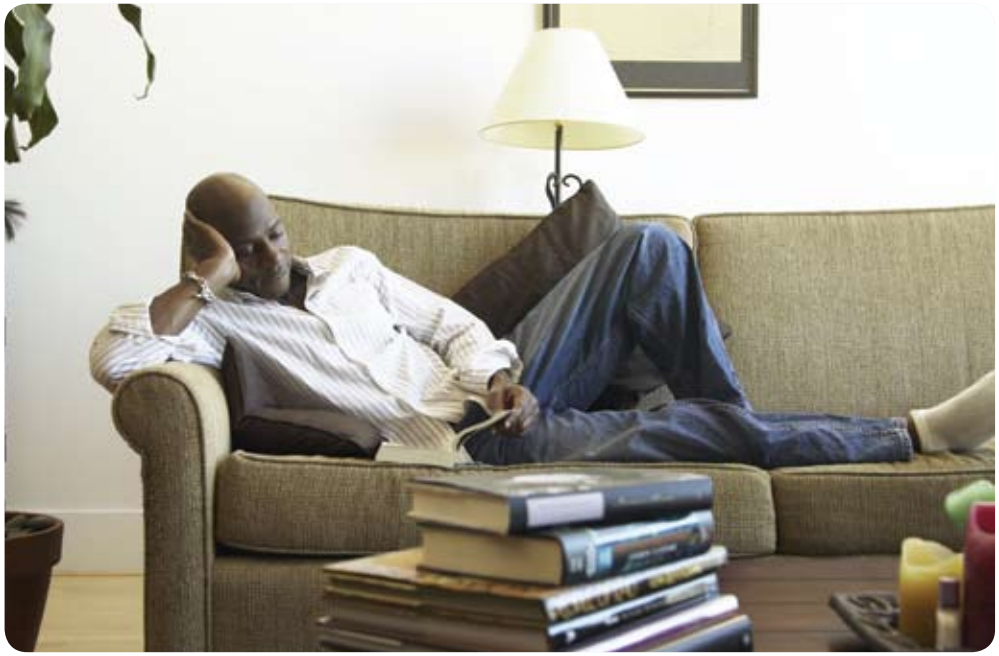
"I want to replace my old boiler. How do I know what boiler to get?"
The type and size of your new boiler will depend on a range of factors like the size of your property, how well it is insulated, and the type of fuel and heating system you use to heat your home.

Your installer will be able to advise you on the type and size of boiler best suited to your home.

"How often should I get my boiler serviced?"
It's important to have any gas or oil fired appliance like a boiler serviced once a year. The flue will need checking to make sure it is clear, and your installer will also check that your boiler is running safely and efficiently for you.

It's best to check with your manufacturer about service schedules: as some boilers may need servicing more than others.



"How can I make my central heating system more efficient without spending lots of money?"
Your first step should be to make sure you are using your heating controls correctly. Review your boiler thermostat, cylinder thermostat, time programmer and TRV settings and re-set them to match your needs more closely in terms of timing and comfort.

If you have radiators, make sure that they are not blocked by furniture or curtains. Any obstructions will stop air flowing freely around the radiators – and so reduce their overall efficiency. Fit reflective panels on the wall behind the radiator, especially if it's an outside wall.

Also, try insulating your pipes in unheated parts of your home like the loft. Insulation material for a standard 15mm pipe costs around £1.50 per metre and will reduce heat loss. Fit a jacket, 3 inches or 75mm thick, to your hot water cylinder too if it isn't already insulated. Jackets cost around £12 and could save you around £40 a year.

Getting your boiler serviced once a year will make sure it continues to work as efficiently as possible. Typically, this will cost between £50 and £75.

"I don't get a consistent heat throughout my radiators. What can I do to fix this?"
Air can stop hot water from reaching all parts of the radiator and decrease its effectiveness. A radiator that needs bleeding will not be as warm as other radiators, and its heat will be concentrated at the bottom. The heating system should be switched off when you bleed radiators to stop more air from entering the system. Hold a tea towel underneath the radiator key and open the valve very slowly as dirty water can spray out. Close the valve once the hissing stops.

Warm words from an energy conscious consumer

"I don't think people realise how much more efficient a condensing boiler is, and how much money they could save by combining the right boiler with the right controls…"

So says energy conscious consumer Philip Williams: a recent convert to the cause of condensing boilers. Having recently built an extension to his home, he not only installed a new regular condensing boiler, but also bought a new set of heating controls.

As well as a condensing boiler with separate water tank for his home's hot water, Philip has fitted timer switches for his heating and hot water. Philip said: "I also have thermostatic radiator valves on all my radiators, so I can set different temperatures in different rooms."

Philip kicked off his search for a new heating system with a little online research of his own. For expert advice, he then discussed his home's heating needs with an installer – and chatted to various local experts on a day out at the Royal Norfolk Show.

Philip said: "The condensing boiler is certainly more reliable and efficient than my previous boiler.

I haven't had a bill yet, but I fully expect my new heating system to prove itself not only environmentally but also financially."

For Philip, a new heating system is just one step along the road to greater energy efficiency.

He said: "I've been investigating renewable energy options, and fully intend to use solar water heating."

But for now, he's more than happy with his most recent energy saving purchases.

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Get more advice on energy efficiency

Call your local advice centre on **0800 512 012** for free, impartial advice on making your home more energy efficient.

Our experts:

- Can advise you on the most cost-effective energy saving measures that are suitable for your home.
- Know your local area and where you can buy energy saving products.
- Can tell you about any available grants or offers for energy saving home improvements.
- Will guide you through the whole process of taking energy saving action.

How about some more energy saving tips?

There are plenty of other simple things you can do around the home today to help you save energy.

- Fit Energy Saving Recommended bulbs. Just one energy saving bulb could save you around £3 a year on average, or up to £6 a year for brighter bulbs or those used for more than a few hours a day. Over its lifetime, each bulb you install will save you around £45.
- Switch your appliances off; don't leave them on standby or on charge unnecessarily and save around £37 per year.
- When making hot drinks, only boil as much water as you need – but remember to always cover the element in an electric kettle.
- Washing your clothes at 30°C instead of at higher temperatures uses around 40% less electricity.

To save even more energy, other measures you could consider include insulating cavity or solid walls and topping up your loft insulation to 270mm (10.5 inches).

For more ideas on how to save energy, visit **energysavingtrust.org.uk** or call **0800 512 012**.

About the Energy Saving Trust

The Energy Saving Trust is one of the UK's leading organisations set up to address the damaging effects of climate change. We aim to cut emissions of carbon dioxide (CO_2) – the main greenhouse gas causing climate change – by promoting the sustainable and efficient use of energy.

We are an independent, non-profit making organisation that provide free, inpartial information and advice. Our network of advice centres across the UK are specifically designed to help people take action to save energy.

The costs and paybacks shown are approximate, are provided for illustrative purposes only and are based on a gas heated semi-detached house with three bedrooms. Insulation and heating savings assume a gas heated three bedroom semi-detached house and a gas cost of 4.03p/kWh.

Appliance and lighting savings assume an electricity cost of 13.95p/kWh and take into account the 'heat replacement effect'.

Full details of our energy saving assumptions can be found at energysavingtrust.org.uk/energy_saving_assumptions

All measure costs and savings are correct at time of printing. However, financial savings will change as energy prices rise or fall. Please refer to our website for the most recent measure costs and savings.

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Energy Saving Trust, 21 Dartmouth Street, London SW1H 9BP
Tel 0800 512 012, energysavingtrust.org.uk

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