

Why your boiler could be burning money

An ageing boiler means that your fuel bills may be higher than they should be. We look at what the options are if you are thinking of changing yours

Replacing your boiler could cut your heating bill dramatically and help fight global warming.

This sounds like a startling claim, but the Energy Saving Trust estimates that the average conventional gas boiler is only 60 per cent efficient, wasting 40 per cent of its heat as hot waste gases. This means you burn more fuel than you would if your boiler was more efficient. Burning fuel creates the greenhouse gas carbon dioxide (CO₂), so the waste is a

problem for your wallet and for the environment. A condensing boiler improves efficiency by taking back heat from the gases normally lost up the flue.

Because of this, the government has ordered that new boilers will have to meet the highest standards of energy efficiency, which in practice means they will be the condensing type.

Condensing boilers are classified by the maximum energy they can convert to heat your water, ranging from 12 to

The average conventional gas boiler is only 60 per cent efficient

40kW. The smaller your home, the fewer the kW you need, although your current heating arrangements will also affect this. A boiler producing less than 38kW is fine for most houses and flats.

We've tested combination boilers, which provide central heating and hot water on demand, plus heat-only models which run the central heating and provide hot water via a separate cylinder.

To see what difference a new boiler might make to your bills, see p41.

What you should look for

PROGRAMMER/TIMER

This makes getting up on cold mornings easier as it allows you to set when the heating comes on, but it doesn't come as standard on many boilers. You can buy an electronic timer from builders' merchants but get an electrician or heating engineer to install it. Mechanical timers are fiddly to set up and are less accurate

PLUME

Condensing boilers produce a plume of water vapour. The flue must be sited carefully – for example, above the roof line – and in accordance with building regulations, to prevent nuisance

CONDENSATE DRAIN

The condensing process produces an acidic liquid which must be drained off. This affects where the boiler can be sited, as it must be easily plumbed into a drain



SIZE

Most manufacturers make each of their boilers in a range of heating outputs, typically from 12 to 40kW, which are suitable for different types of home. The size you need will depend on the amount of heat and, in the case of a combi boiler, hot water you require

WALL MOUNTING

All the boilers that we tested were wall mounted, but don't assume this means they can be shut away in a kitchen cupboard. If you specifically want to hide the boiler, discuss this with your installer

SERVICING

The manufacturers of all the models we tested recommend an annual service of your boiler to ensure it is operating efficiently and safely



1 COMBI FOR SMALL FLAT

74% Potterton Gold C24 HE £681

This has an impressive range of controls, including a selector which allows you to turn the central heating off separately. There are also central heating and hot water temperature controls and a mechanical timer.

The Potterton only just missed making it into the top category of a Sedbuk A-rated device (see 'Fuel for thought', below) but you'd be hard pressed to get a better near-miss. It was also exceptionally easy to service, according to our Corgi-registered gas fitter.

WORTH KNOWING Our survey of *Which?* members found Potterton boilers are more reliable than average.

Measured Sedbuk efficiency 89.9% Measured hot water output 24.6kW Timer Included Warranty 3 years

WHICH?
BEST
BUY



2 COMBI FOR SMALL FLAT

73% Vaillant ecoTEC Plus 824 £807

We found the Vaillant particularly easy to use. Its controls include a digital display, central heating and hot water temperature controls. There is space for an optional timer.

Manufacturers of most of the 17 boilers we tested claimed theirs met the top energy-efficiency standard, but this was one of the few that did.

Our installer said fitting was easy in general but routing the cables was difficult. This could mean you have to pay extra labour costs.

WORTH KNOWING The ecoTEC Plus was the only Vaillant model range that was available to test. Two sizes were Best Buys (see right).

Measured Sedbuk efficiency 90.4% Measured hot water output 22.1kW Timer Optional Warranty 2 years

WHICH?
BEST
BUY

The Vaillant ecoTEC Plus 831 should run your bath faster than any of the others



3 COMBI FOR MEDIUM FLAT/HOUSE

72% Vaillant ecoTEC Plus 831 £1,045

This larger version of the ecoTEC Plus also achieved the top efficiency in our tests. It did slightly less well than the smaller model when running at full capacity.

The controls include a digital display, and temperature controls for central heating and hot water. There is a space for a timer. It is easy to use and straightforward to install and service.

Like the smaller Vaillant, one aspect of installation – routing of the cables – was time consuming.

WE FOUND It has the biggest hot water output of any combi boiler we tested, so it should run your bath faster than any of the others.

Measured Sedbuk efficiency 90.1% Measured hot water output 30.6kW Timer Optional Warranty 2 years

WHICH?
BEST
BUY

Fuel for thought

All boilers are given a rating for energy efficiency. We explain what you should expect

Boilers are rated on how much of the fuel they consume is converted into heat for our homes rather than escaping into the air as hot waste gases.

This is called a Sedbuk rating (seasonal efficiency of a domestic boiler in the UK). These run from A (more than 90 per cent) to G (less than 70 per cent). Condensing boilers are generally 85 to 91 per cent

efficient, while conventional models are typically between 66 and 81 per cent.

However, since many of us will not have replaced our boilers recently, the average gas boiler in the UK is only about 60 per cent efficient.

The rating represents the average annual efficiency achieved in typical home conditions, making reasonable

assumptions about how a boiler is used, the climate and controls. It's calculated from the results of standard lab tests together with factors such as boiler type and type of fuel used. The ratings were designed to allow you to compare different models.

Since last year, building regulations in England and Wales require new boilers to have a Sedbuk rating of A or B.

Band	SEDBUK range
A	Above 90%
B	86%-90%
C	82%-86%
D	78%-82%
E	74%-78%
F	70%-74%
G	Below 70%

These apply to Northern Ireland from November and to Scotland from next May. Visit www.boilers.org.uk to find ratings for current boilers.

Heat-only boilers



Heat-only boilers are suitable for larger houses

If you have a larger house you will probably find that several people within it want to use hot water at the same time. One person wants to run a bath perhaps, while someone else does the washing up.

In this case, you will probably be better off with a heat-only boiler rather than a combi. A heat-only boiler

provides warmth for radiators directly and connects to a separate cylinder to provide hot water to several places at once. This system takes up more space than a combi.

We tested four 30kW heat-only boilers and found little difference between their performance, so there are no Best Buys in this

category. None achieved its claimed Sedbuk A rating, but all reached efficiencies of 87.8 per cent or more. The Worcester and Glow-worm missed the top rating by less than 0.5 per cent. These two also produced the least nitrogen oxides, gases that pollute the environment and contribute to acid rain.

Insider information

Victoria Pearson finds out which towns are the worst for producing greenhouse gases and which are doing better

Well done to the good people of Hull who, according to research commissioned by British Gas, had the lowest carbon dioxide emissions per dwelling of 23 selected British cities in 2003. Even so, the average Hull house produced 4,395kg of CO₂ a year – enough to fill 440,000 party balloons. But they did a lot better than the people of Reading,

who produced 6,189kg of CO₂. Gas consumption in Reading is 27 per cent above the UK average, thought to be partly due to the number of homeworkers or small businesses in the area. Replacing a conventional boiler with a condensing one could reduce the CO₂ produced by a central heating system by 15 to 30 per cent.



How to buy a boiler

Our tips on finding the right one for your home

WHO SHOULD FIT IT

There are several places you can go to for advice on buying a boiler. It has to be fitted by a competent person in accordance with the Building Regulations and Gas Safety (Installation and Use) Regulations.

merchant or order online, but you'd have to be confident it matched your current energy requirements. If your installer recommends a specific boiler, it's probably worth ringing round suppliers to compare prices.

FIND AN INSTALLER



The easiest way to ensure you get a competent person to put in the boiler is to use a Corgi

(Council for Registered Gas Installers) registered installer. Corgi has a list of registered installers in your area. Installers must carry an ID card which lists the gas work they're qualified to do. You should check it covers what you need done and has the words 'energy efficiency' printed on the back. You can also check their registration with Corgi (see 'Contacts', opposite).

DISCUSS YOUR NEEDS

You can't just assume that a certain size of home needs a certain size of boiler. Make an appointment for your chosen installer to come round and discuss your heating and hot water needs. They will take into account factors such as the number of radiators you have, number of bathrooms, whether you have double glazing and how much heat your home loses, before recommending the boiler you need. This could be a good time to review your entire heating. Key points to discuss are:

- changes you plan to make, such as adding more rooms or changing a bedroom to a bathroom
- how well does your current system meet your requirements? Do any rooms need an extra or larger radiator, for example, or could you free up

THE GAS COMPANY

If you ask your gas supply company for advice, it may have agreements with particular boiler makers and so have information only on their products. If you ask the gas company, it will tell you this. Manufacturers will have a list of installers for their products.

IF YOU BUY DIRECT

If you know which boiler you want, you could buy direct from a builder, a plumber's



space by changing to a combi boiler? ■ energy-efficiency improvements you've made since the last boiler was fitted: double glazing, loft insulation, cavity wall insulation and draught proofing all reduce heat loss and your heating needs



■ what central heating controls will make your system more effective.

Once you have assessed your needs your installer will recommend a new boiler and may even outline the savings you can expect with a more efficient model. It's worth asking the following questions so you know what to expect from your new boiler:

- how will a condensing boiler be different from your conventional model?
- how did the installer decide on the size and make of boiler?
- will they receive commission from the sale of the boiler?
- is there a warranty and what will it cover?
- how often should the boiler be serviced?
- how will they make sure the plume is not a nuisance?

KEEP THE CERTIFICATE

Once the boiler is installed, keep the certificate your heating engineer will give you. You will need to produce it if you move house, to prove that the appliance was installed by a professional.



Contacts

Baxi
08706 096 096
www.baxi.co.uk

Corgi
0870 401 2200
www.corgi-gas-safety.com

Energy Saving Trust
020 7222 0101
www.est.org.uk

Glow-worm
01773 824 639
www.glow-worm.co.uk

Health and Safety Executive
0845 345 0055
www.hse.gov.uk/gas

Ideal
0870 849 8056
www.idealboilers.com

Potterton
08706 060 780
www.potterton.co.uk

Saunier Duval
0870 606 4351
www.saunier-duval.co.uk

Vaillant
01634 292 300
www.vaillant.co.uk

Worcester
01905 754 624
www.worcester-bosch.co.uk

MEMBER BENEFIT

Switch with Which?

Thinking about changing your boiler?
Why not see how you can save on your whole energy bill at the same time?



People switching their gas and electricity through **www.switchwithwhich.co.uk** saved on average £158* on their annual energy bills. Switching is easy – it takes around ten minutes on the internet, then the

energy company will take care of the rest of the switch for you. Why not see how much you could save by logging on?

* This figure is the average annual saving per household which switched using our website between 20 July 2005 and 7 February 2006

How we test

We check the gas and electricity consumption, efficiency and emissions given off by each of the boilers on test. We also ask a Corgi-registered gas installer how easy each is to install, service and use

Efficiency

We conduct tests according to European standards to measure how much of the gas that the boilers burn



is converted into heat. The cliché about giving 110 per cent proves to almost true in this case – one of the strange quirks of condensing boilers is that, while in condensing mode, they can achieve a maximum efficiency of 107 per cent because they use energy from the flue gases as well as the fuel to produce heat.

to install and service. Our fitter also checks how easy it is for the householder to use the controls, what warranty is provided and how noisy the boiler is while in operation.

Durability

Boilers are expected to last a long time. We run a durability trial that involves turning the boilers on, running them for five minutes at full capacity and switching them off again. We do this 2,920 times – the equivalent of using a boiler for almost a year (although combis will be fired up much more frequently). Most of the boilers made it through unscathed, but the temperature display of the Glow-worm Flexicom 30cx (7) and Glow-worm 30hxi (15) developed a minor fault after 300 cycles. The casings of the two Ideal boilers (12 and 13) showed signs of wear after the durability trial, too.

Ease of use

Our gas fitter installs each appliance, checking that the gas and electrical connections are easy to make and have plenty of room. He assesses how easy it is to service the boiler, track down faults and to replace common parts. Most of those we tested are straightforward



Facts & scores

Differences that emerged during our testing

Useful to know

To turn off the central heating on this model, switch the central heating temperature control all the way to the left.

A quiet boiler

Our installer found that the Saunier Duval was particularly quiet when running. The Glow-worm Flexicom 30cx was the noisiest model.

Long warranty

The only boiler that comes with a five-year warranty is the Baxi Platinum C28 HE. It covers parts and labour but not servicing.

Other boilers usually come with a warranty that lasts between one and three years.

Just enough

A boiler must be 90 per cent efficient or above to get the highest A Sedbuk rating. Many of the manufacturers develop products that will just about achieve this. Twelve of the boilers we tested had claimed efficiencies of 90.1 to 90.9 per cent. We found most were close to what was claimed. The Potterton Promax 30 HE Plus, however, was 3 per cent lower. Generally, the boilers rated as high Bs rather than low As.

MODEL	SPECIFICATION					
	PRICE (£)	SIZE S AVAILABLE (kW)	OUTPUT MIN/MAX (kW)	CLAIMED HOT WATER FLOW RATE (litres/min)	SIZE (hxxwxd) (mm)	LPG CONVERTIBLE
COMBINATION BOILERS						
1 POTTERTON Gold C24 HE	681	24 , 28, 33	7.4-25.9	9.8	780x450x345	No
2 VAILLANT ecoTEC Plus 824	807	24 , 31	7.1-20.2	9.4	720x440x300	Yes
3 VAILLANT ecoTEC Plus 831	1045	24, 31	9.2-25.5	12.7	720x440x300	Yes
4 POTTERTON Promax Combi 28 HE Plus	677	28 , 33	9.5-25.9	11.5	780x450x345	No
5 SAUNIER DUVAL Thema Condens F24E	684	18, 24 , 30	8.4-19.6	11.5	742x410x370	Yes
6 BAXI Platinum C28 HE	858	24, 28 , 33	9.5-25.9	11.5	780x450x345	No
7 GLOW-WORM Flexicom 30cx	782	30 , 24	9.3-24.9	12.3	700x390x280	No
8 GLOW-WORM Glow-worm 24cxi	727	24 , 30, 38	4.95-20.02	9.8	725x450x334	No
9 WORCESTER Greenstar 30 Si	1,103	25, 30	7.38-25.45	12.3	710x400x330	Yes
10 BAXI Combi Instant 80 HE	595	24 , 30	10.1-25.2	9.8	780x450x345	Yes
11 WORCESTER Greenstar 24i Junior	772	24 , 28	7.38-25.45	9.8	710x400x330	Yes
12 IDEAL Mini HE C24	568	24 , 28	11.1-26.6	10.1	803x400x345	Yes
13 IDEAL Excel HE C28	681	24, 28 , 32	18.3-29.8	11.5	800x450x320	Not stated
HEAT-ONLY BOILERS						
14 WORCESTER Greenstar 30CDi	834	25, 30 , 35, 40	8.6-31.8	N/A	750x440x360	Yes
15 GLOW-WORM Glow-worm 30hxi	730	12, 15, 18, 24, 30 , 38	5.3-30.58	N/A	600x375x334	Yes
16 BAXI 100/2 HE Plus	735	30	10.0-32.61	N/A	600x390x320	No
17 POTTERTON Promax 30 HE Plus	718	15, 24, 30	10.1-32.61	N/A	600x390x320	No

USING THE TABLE

We tested models from manufacturers based on their recommendations for a small or medium flat and a large house and on finding boilers with the most comparable outputs from manufacturers' ranges. The more stars the better.

Specification

Price The price we paid from a plumbing supplier excluding VAT. This is the price you are likely to see quoted, but you'll have to pay VAT on parts and labour. **Sizes available** The maximum energy a boiler

can produce to heat your water. This is measured in kW. The size in **bold** is the one we tested. **Output min/max** The minimum and maximum energy a boiler can produce while working in condensing mode, measured in kW. **Claimed hot water flow rate** How many litres of hot water a minute the boiler is capable of producing. This would affect how quickly your bath would run, for example. **Size** Excluding space for ventilation or cables. **LPG convertible** Whether the boiler can be converted to burn liquid petroleum gas. **Timer or**

clock supplied Whether a timer or clock is supplied or is available as an option.

Declared and measured Sedbuk category Whether the claimed efficiency proved to be true in our tests (in nine cases, the difference is less than 1 per cent).

Test performance

Efficiency Heat output versus energy input, with the boiler working at full and partial capacity. **Power use** How much electricity the boiler uses and what heat is lost from the casing. **NOX emissions** How much of the polluting nitrogen

oxide gases were produced by the boiler while it was working at a steady state.

Features Whether the boiler includes features such as temperature controls or a display showing in what mode it is running. **Ease of use** How easy the boiler was to install, service, to diagnose faults with and to use.

Score

This ignores price and is based on:

Performance	60%
Ease of use	20%
Features	15%
Safety	5%

			WHICH? TEST PERFORMANCE					SCORE %
TIMER OR CLOCK SUPPLIED	DECLARED SEDBUK CATEGORY	MEASURED SEDBUK CATEGORY	EFFICIENCY	POWER USE	NOX EMISSIONS	FEATURES	EASE OF USE	
Yes	A	B	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	74
Opt	A	A	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	73
Opt	A	A	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	72
Opt	A	B	★★★★★	★★★★	★★★★★	★★★★★	★★★★★	69
Yes	A	A	★★★★★	★★★★	★★★★★	★★★★★	★★★★★	68
Yes	A	B	★★★★★	★★★★	★★★★★	★★★★★	★★★★★	67
No	A	B	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	63
Opt	A	B	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	62
Opt	A	B	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	61
Opt	B	B	★★★★	★★★★	★★★★★	★★★★★	★★★★★	58
Opt	A	B	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	58
Opt	B	B	★★★★	★★★★	★★★★★	★★★★★	★★★★★	54
Opt	B	C	★★★	★★★★	★★★	★★★★★	★★★★★	46
Opt	A	B	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	68
No	A	B	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	67
No	A	B	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	62
No	A	B	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	62

Useful to know

Here are a few useful options to think about for getting the most out of your boiler

■ LPG CONVERSION

Up to 10 per cent of homes in the UK do not have access to natural gas from a gas main and so rely on oil or liquid petroleum gas for their heating needs.

Many of the boilers we have tested can be converted to run on LPG, giving you more choice of which will be installed in your home.

Conversion is relatively simple but it must be carried out by a competent person, which in practice means a Corgi-registered gas installer.

■ RELIABILITY

An online survey of *Which?* members revealed that 62 per cent of boilers up to ten years old have never needed a repair. None of the major brands that we tested was below average for reliability.

See p42 for information on boiler maintenance contracts.

■ CONTROLS

To get the most effective heating system for your home you'll need not only a high-efficiency boiler but also good controls which ensure that the boiler is working only when heat is needed.

How much could you save each year on your fuel bill?

A modern condensing boiler could cut your fuel bills. The Energy Saving Trust compares annual gas bills of old and new boilers - but figures will vary depending on your situation

BOILER TYPE	SEDBUK	Flat	Bungalow	Terraced	Semi-detached	Detached
OLD GAS HEAVYWEIGHT	55%	£227	£297	£309	£350	£496
OLD GAS LIGHTWEIGHT	65%	£192	£251	£261	£296	£420
NEW GAS NON-CONDENSING	79%	£158	£206	£215	£244	£345
NEW GAS CONDENSING	90%	£138	£181	£189	£214	£303

