



Centre for
Alternative
Technology

HOME ENERGY AUDIT

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Home energy audits

Reducing household energy consumption is an important step in reducing both your utility bills and your carbon dioxide emissions. A home energy audit will estimate the energy used by your electrical appliances and how much insulation and draught proofing you have to work out where you are using energy in your home and what changes you can make to save energy.

A simple way of getting started is to keep a log of your gas and electricity meter readings on a weekly basis. This allows you to see the effect of any changes you make.

There are several tools that you can use to conduct your own energy audit, and this will give you a good idea of what measures you need to take to improve the energy efficiency of your home and the financial savings that you could make. There are also professional energy efficiency consultants who can carry out a household audit.

Space heating

Around 60% of the energy use in an average home is for space heating, and a further 25% is for hot water. All of this is consumed by your boiler, so it is really important that it is efficient. Bringing insulation levels up to date and installing a modern efficient condensing boiler will often save between 30% and 50% of your heating bill, so this is an important place to start saving energy.

Two online calculators that can be used to assess your home heating are the Resurgence House Energy Audit Calculator (HEAC), available at www.resurgence.org/resources/heac.html, and the Energy Saving Trust (EST) Home Energy Check calculator, at www.est.org.uk/check.

Both require information that you can easily work out, such as: the number and approximate size of rooms; insulation levels; single or double glazing. If you do not know, you may need to check how thick the insulation is in your attic and if you have solid or cavity walls. The EST calculator goes into greater detail, and includes heating systems and lighting. Both show the amount that bills could be reduced by, and the EST calculator includes the tonnes of carbon that could be saved and gives detailed advice on any renovation work suggested.

Assessing your electricity use

You'll find your total electricity use on your meter or your electricity bill. Overall, average household electricity use in the UK is about 4,500 kilowatt-hours (kWh) per year, but for homes that don't have electric heating the average will be about 3,600kWh (a kWh is the standard electrical unit).

You can assess the energy consumption of different appliances with a powermeter. This device plugs into a mains socket, with the appliance to be tested plugged into the meter. Both instantaneous power consumption and cumulative energy use can be monitored. You can do this for each appliance (oven, washing machine, computer, electric kettle, hair dryer, iron, etc), record energy use in operation and when on standby, and multiply by the average number of hours the appliance is on each day.

To measure electricity used by lighting: for each bulb in your house estimate the number of hours it is switched on each day and multiply this by the wattage. Divide by 1,000 for the kWh used. For example, 3 hours of a 60watt bulb uses 0.18kWh.

As your appliance and lighting use is likely to vary throughout the year, it is more accurate to make separate summer and winter estimates. Over the page is an example of a recording table.

To get the full household electricity use, include all electrical appliances. Multiply summer and winter weekly totals by 26 to get an estimate for each season, and add these to get the full year total.

Using the results of your electricity audit

Your electricity audit will show you exactly where you can lower your electricity usage. You may be able to make some changes immediately, such as switching off appliances at the wall rather than leaving them on standby or changing to energy saving light bulbs.

For example, two 100-Watt bulbs on for 2 hours per day in summer and 6 hours per day in winter will use about 290kWh per year. At an average of 15p per kWh, that will cost you £43.50. Replacing those 100W bulbs with 20W CFLs (compact fluorescent lamps) would reduce this cost to £8.70 per year. And the CFLs also have a much longer lifespan.

You might also find that you can save money by replacing old appliances with newer more efficient ones that would quickly pay for themselves.

The worst offenders in the typical household are:

- lighting – 20% of electricity consumption
- cold appliances – making up another 20%
- appliances left on standby – responsible for 8 to 10% of average household electricity use.

Recording & calculation table examples:

Summer:

Appliance	Power	Use per day	kWh per day	kWh per week
Fridge-freezer (A rated)	Variable - average per day measured.	-	0.44	3.1
Computer in use	200W	3 hours	0.6	4.2
Computer on standby	50W	2 hours	0.1	0.7
Kitchen lights	2 x 100W = 200W	2 hours	0.4	2.8
Total				10.8

So an estimate of total summer electricity use for these appliances is $26 \times 10.8 =$ about 280kWh.

Winter:

Appliance	Power	Use per day	kWh per day	kWh per week
Fridge-freezer (A rated)	Variable - average per day measured.	-	0.44	3.1
Computer in use	200W	3 hours	0.6	4.2
Computer on standby	50W	2 hours	0.1	0.7
Kitchen lights	2 x 100W = 200W	6 hours	1.2	8.4
Total				16.4

So total winter electricity use is about 425kWh, and the annual total is about 700kWh.

Energy Performance Certificates (EPC)

As of 1st October 2008, all properties (homes and commercial & public buildings) need an **Energy Performance Certificate (EPC)** when bought, sold, built or rented. The EPC will tell you how energy efficient a home is on a scale of A-G (A being the highest). There are two ratings:

1. The **energy-efficiency rating** indicates a home's overall efficiency. The higher the rating, the more energy-efficient the home is, and the lower the fuel bills are likely to be.
2. The **environmental impact rating** indicates a home's impact on the environment in terms of carbon dioxide (CO₂) emissions - the higher the rating, the less impact it has on the environment.

Each rating is based on the performance of the building itself, relating to the construction materials and insulation, and services such as heating and lighting - but not domestic appliances. The certificate also lists the potential rating of the building if all the cost-effective measures were installed and includes recommendations on ways to improve the home's energy efficiency to save you money and help the environment. The average property in the UK is in bands D-E for both ratings.

Households that take up offers under the Carbon Emissions Reduction Target (CERT), such as insulation and heating system offers from utilities suppliers, are given energy audits. It's also possible to hire a freelance consultant to carry out a home energy audit for you. For an average house, the likely cost is about £100. More information about Energy Performance Certificates, and finding an assessor, is available from the Government Direct website and the Energy Saving Trust (see below).

Further information

CAT publishes a book called the '*Energy Saving House*', which is full of useful information on how to make your house more energy efficient. This, and many other books on energy saving and low-impact living, are available through **CAT mail order**.

Web: <http://store.cat.org.uk>

Tel: 0845 330 8355 or 01654 705959

CAT's residential courses include *Eco-refurbishment* and *The Sustainable Home*, which both cover in detail how to improve the energy efficiency of your home.

www.cat.org.uk/shortcourses; Tel: 01654 704952

CAT consultancy can offer detailed one-to-one technical advice on improvements to your home. www.cat.org.uk/consultancy; Tel: 01654 705991

Contacts

Government Direct: www.direct.gov.uk/epc
Government website with information on the Energy Performance Certificate and accredited assessors.

Energy Saving Trust

Web: www.est.org.uk; Tel: 0800 512 012.

Maintain a useful website and a network of local Energy Efficiency Advice Centres giving help with energy saving in the home. Their web site has searchable databases of grants & offers, efficient appliances and frequently asked questions.

Green Homes Concierge Service

www.greenhomesconcierge.co.uk; 0800 089 0098

A service for London Homeowners only. For £199 you get a personal home check, a report, and a years' worth of guidance on gaining grants and finding suppliers.