ENERGY EFFICIENCY IN THE HOME

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Why save energy?

There are two reasons why we should try and save energy – for the planet and for ourselves. When we burn fossil fuels (to produce electricity, heat our homes or fuel our cars) carbon dioxide is released into the atmosphere. Since the industrial revolution the amount of carbon dioxide that is released each year has increased year after year. Carbon dioxide is a 'greenhouse gas' that forms a dense layer around the earth, which prevents heat escaping. The rising temperature that results is leading to climate change and we are already beginning to see the effects of this.

The latest studies show that we need to reduce our carbon dioxide emissions by 100% in the next 20 years to avoid runaway effects of climate change. One important way to achieve this is to reduce the amount of energy we waste, by improving the energy efficiency of our homes.

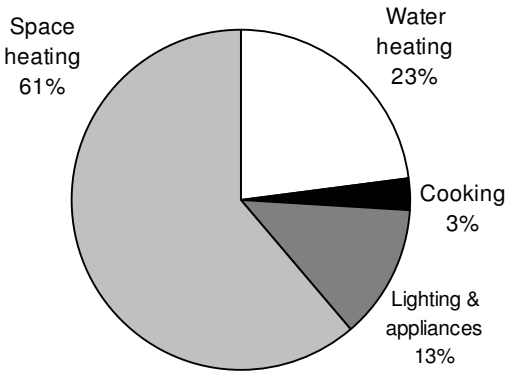
Saving energy will also save you money, and make your life more comfortable and healthy. You can reduce your energy bills, improve the warmth of your home and reduce condensation. The amount of money you save depends on the cost of your heating fuel, and electricity and oil prices have risen significantly in recent months.

All bought or rented houses, old and new, must now have an Energy Performance Certificate (EPC). This assesses a buildings' efficiency and covers thermal insulation, efficiency and control of heating, fuel used, ventilation, lighting and solar gain (but not appliances). Another rating, the NHER (National Home Energy Rating), looks at running costs, so includes lighting and appliances, and also accounts for geographical location.

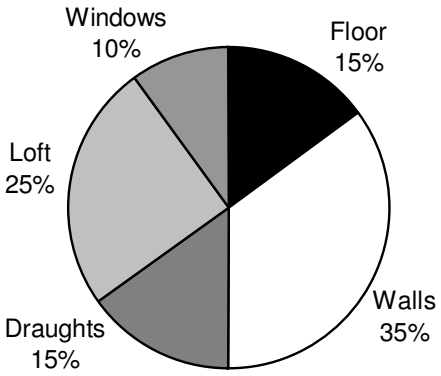
Where is energy lost?

In the UK, around 30 per cent of all carbon dioxide emissions released into the atmosphere come from the energy used in our homes. Energy efficiency measures can easily reduce this impact by a third, reducing annual emissions of carbon dioxide from each household by two tonnes. The following charts show where this energy goes.

Average energy use in the home:



Heat Loss from an average home:



Minimising Heat Loss

Walls - if you have cavity walls you can easily get insulation blown in. This takes less than a day to do and causes minimum disruption. It is a little more expensive and disruptive to insulate solid walls, but still worthwhile. Internal insulation can be put up on the inside of external walls. You lose a little of the room space and will need to re-plaster, but you will save on energy from heating.
External insulation is less disruptive, and it means you keep the 'thermal mass' of wall inside. The wall will then act as a form of heat storage, absorbing heat and slowly releasing it – so making a comfortable living environment.

Loft insulation is simple to install and in most cases can be done by the householder. To meet Building Regulations, a minimum of about 250mm is necessary, but the optimum thickness is around 350mm - so where it's easy, put in more. If your loft space has been converted into a room, you'll need to insulate in the sloping roof. High levels of insulation can be hard to achieve because a free air space of 50mm must be left between the insulation and the tiling felt, unless this felt is of a low-vapour resistance type. The most economic way of achieving a good thickness of insulation in the roof slope is to use two layers of timber: the first to support the roof finish, the second to support the insulation and ceiling finish. Insulation between the timbers will then provide a thermal break.

Floor insulation is easy to install if you can gain access to the space below the floorboards and can fit insulation bats between the floor joists. It is more difficult if there is no easy access to this space or you have a solid floor. It can be done by either lifting floorboards or raising the floor level.

Draught-proofing is a very simple home efficiency job. Draughts will occur down chimneys, around window and door frames, through letterboxes and cat flaps, where services enter, at skirting boards, and between floorboards. As a simple test to find out where there is unwanted ventilation, carry around a smoking stick such as incense - if held near a draught you will see the smoke blown horizontally. Some ventilation is essential, for example providing air to rooms with fuel burning appliances and ventilating timbers in the roof and floor, but it is easy to minimise unwanted ventilation. Use a sealant paste to fill in gaps around skirting boards, between floorboards and around service ducts. Unused chimneys should be boarded up – or if you would like a more temporary measure then inflate a balloon into the chimney, in this way if a fire is lit the balloon will burst freeing the chimney. Compression seals and wiper seals are available from your local ironmonger and can be used on openings such as windows, doors, cat flaps and letterboxes. Insulating curtains will greatly reduce night-time heat loss from windows – if drawn!

Central heating will work more efficiently if controls such as thermostatic radiator valves and room thermostats are used. Such controls make it possible to only heat different rooms as much as you need, rather than heating the whole house to the same temperature.

Hot water energy needs can be reduced by giving your hot water tank an extra jacket and wrapping all hot water pipes in insulating foam. Solar water heating is a larger job, but can provide up to 50% of your hot water needs (for more details see our information sheet on the solar water heating).

The Potential Savings

Measure	Cost (£)	Payback
Low-energy light bulbs	5	7 months
Lag water tank and pipes	20+	1-2 years
Lagging loft	140+	2 years
Draught-proofing	40+	3-4 years
Cavity Wall insulation	260-380	3-5 years
Central heating controls	125-250	2-5 years
Floor insulation	100 (DIY)	4-7 years
Double glazing (per unit)	120 (DIY)	24 years
	600 (prof)	120 years

Glazing: If you are planning on replacing your windows the most efficient option is argon filled triple glazed units made with low emissivity (low-E) glass. Argon is an inert gas that conducts heat less well than air. Low-E glass reflects heat back into the house. A simpler and cheaper alternative is to fit secondary glazing, which can be as basic as sticking a clear plastic film around the frame. Your local DIY store should be able to advise you.

Upgrading appliances: When buying any new appliance, from light bulb to boiler, ensure they are a suitable size and are the most efficient model on the market. The Energy Label gives a rating, with A (sometimes A++) for the most efficient.

See our free **Electricity Saving in the Home** sheet for more advice on lighting and appliances.

Further information

CAT publishes a number of tipsheets on energy efficiency including: *Insulation*, *Come Clean* (choosing a washing machine), *Bright Ideas* (about lighting), *Cool It* (about fridges and freezers). These are available from the pay-per-view page of the CAT website: *www.cat.org.uk/catpubs/ppv.tmpl*

For further energy efficiency ideas *'The Energy Saving House'* is full of useful tips, and *'The Whole House Book'* is a comprehensive guide for those designing a new home or renovating an old one.
All of our publications are available by mail order: Tel: *01654 705959*; *www.cat.org.uk/shopping*

CAT's residential courses, *Ecological Building from New, Eco Refurbishment* and *The Sustainable Home* cover energy efficiency. *Tel 01654 705981; www.cat.org.uk/shortcourses*

You can also contact our free information service for advice on particular methods and materials, and for details of suppliers and installers. *Tel: 01654 705989 or email: info@cat.org.uk*

For more advice contact your local **Energy Efficiency Advice Centre** on 0800 512 012 or see the **Energy Saving Trust** website: www.est.org.uk