

CTV007 Sector Overview



# Office based companies

Maximising energy savings  
in an office environment



Making business sense  
of climate change

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Reducing energy use makes perfect business sense; it saves money, enhances corporate reputation and helps everyone in the fight against climate change.

The Carbon Trust provides simple, effective advice to help businesses take action to reduce carbon emissions, and the simplest way to do this is to use energy more efficiently.

This overview for office based companies introduces the main energy saving opportunities for businesses and demonstrates how simple actions save energy, cut costs and increase productivity.

## Introduction

Energy is one of the largest controllable overheads in office buildings which means there are many opportunities to make savings. Reducing energy consumption not only saves money but improves working conditions which can increase staff productivity. Furthermore, the environment will benefit from reductions in energy use and carbon emissions which enhances corporate reputation.

Using the simple and cost effective measures detailed in this guide could reduce your energy bills by as much as 20%.

### Who is this publication for?

Managers of office based companies – from small businesses to national and multinational organisations operating across a number of large sites – can benefit from the advice in this publication. Focusing on low and no-cost measures which will have the quickest payback, this overview demonstrates the best energy saving opportunities applicable to most offices and will help managers to:

- ▶ Assess the potential for energy savings and indicate key areas for improvement
- ▶ Raise awareness of energy conservation amongst staff and motivate them to reduce waste
- ▶ Appraise the overall energy performance of an office.

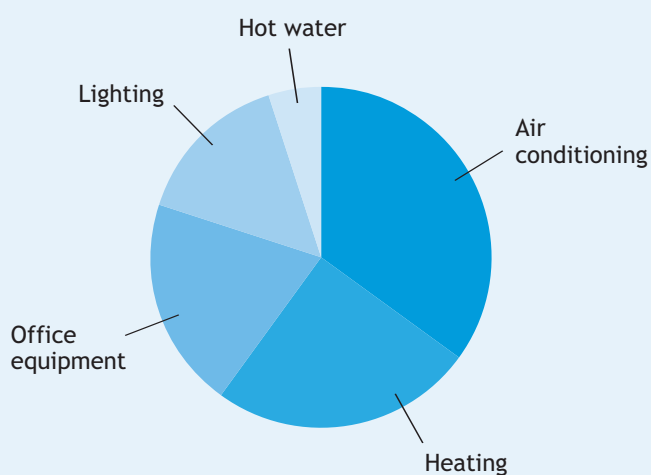
In some sectors, businesses routinely analyse energy use and employ experts to monitor performance. Office based companies usually do not consider this as an option, and energy consumption often takes a low priority on the business agenda.

However, there are big savings to be made and opportunities for staff to contribute to improving their working environment.

## Energy consumption in office buildings

Businesses which are based in an office environment are diverse, yet there are several key areas where energy is commonly wasted. The chart below details where the biggest savings can be made: in lighting, heating, ventilation, air conditioning and office equipment.

### *Breakdown of energy use within a typical air-conditioned office*



Note that proportions of energy use will vary according to occupancy levels and whether the building has air conditioning or mechanical cooling installed. In an office without cooling, the greatest energy user is heating.

In each of the areas identified in the chart, there are three main opportunities to save energy:

**Switching off** – All energy consuming equipment should be switched off when not required. This can be done by staff, by timer switches or by adjusting building control systems and need not cost any money.

**Maintenance** – A number of energy efficiency measures can be carried out as part of routine maintenance procedures for no extra cost.

**Refurbishment/replacement** – Energy saving measures taken when planning major building refurbishment or replacement of equipment can be extremely cost effective.

# Opportunities for energy saving

## ▶ Lighting

Lighting is a significant energy cost in an office and good savings can be achieved through careful consideration of equipment, maintenance and staff habits.

There are many simple and inexpensive ways to reduce the energy consumption and costs associated with lighting without compromising health, safety or comfort levels.

### 'Switch off' policy – involve staff and increase awareness

In many offices, especially open plan ones, lights often remain on much longer than necessary. Staff at all levels should be involved in making savings – appoint someone to take responsibility for turning the lights off. Use emails, intranets and staff meetings to remind people and place stickers above light switches and posters around the building. These are available from the Carbon Trust (see below). Encourage staff to report failing lights and replace them immediately. This will help maintain the desired light output and in turn, provide a safer working environment.

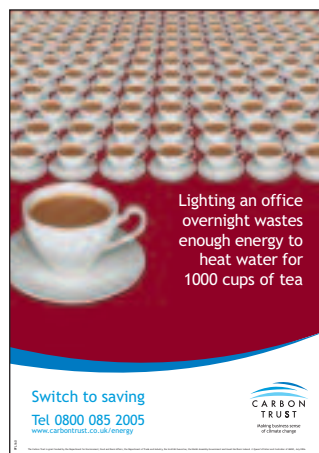
### facts:

- Without regular maintenance, light levels can fall by up to 30% in 2-3 years. Establishing a basic lighting maintenance programme can reduce costs by up to 15% as well as improving office appearance
- Specify high frequency fittings with reflectors to help tubes last longer and eliminate flicker and hum. Mirror reflectors allow the area to be lit by fewer tubes as more light is projected into the space.

### Examples of free posters and stickers available from the Carbon Trust



PFL165



PFL160



PFL170

## Avoid blinds down and lights on

A familiar scene in offices is the use of blinds to control glare when it is bright outside. Where possible, encourage staff to adjust blinds so they make the most of natural light while cutting the glare.

One effective way of achieving this is to use daylight blinds. These enable the natural light to enter the space by re-directing the light onto the ceiling, thereby allowing the 'free' daylight to enter the space and alleviate any discomfort felt by the occupants from glare. Many daylight blinds also have perforated blades to enable a view outside, which is often appreciated by staff.

## Label light switches

Light switches should be clearly labelled to help staff to select only those lights they need. Lights in unoccupied areas should be switched off but remember to consider health and safety implications, particularly in corridors and stairwells.

## Maintenance

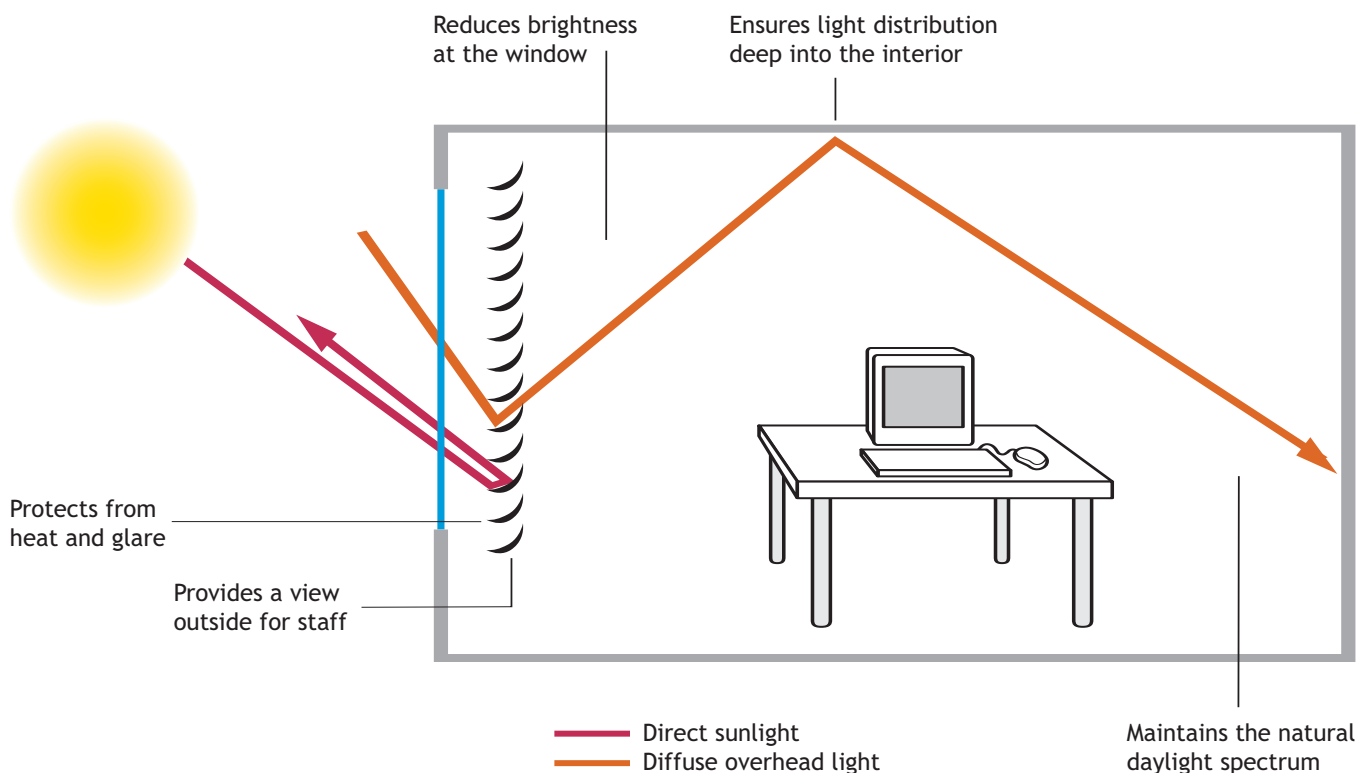
Lighting is essential for providing a pleasant and productive working environment so it is important to keep windows, skylights and light fittings clean. Replace old dim lamps and keep controls in good working order by ensuring timers are set to match occupancy hours and that occupancy sensors are clean.

Replace blackened, flickering, dim or failed fluorescent tubes with tri-phosphor coated ones (this is stated on the packaging). Tri-phosphor coating provides a more natural, brighter light for the whole life of the tube. If the tubes are 38mm (1.5 inch), they should be replaced with slimmer 26mm (1 inch) tubes.

➤ **MYTH** – It is better to leave fluorescent lights on as starting them up wastes more energy than if they remain permanently switched on.

**FALSE!** – Fluorescent tubes use only a few seconds worth of power in start up – therefore, it is always better to switch them off when leaving a room.

## The benefits of daylight blinds



## Install low-energy lighting


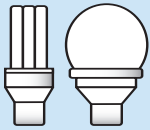

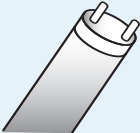
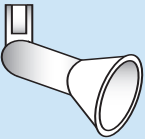

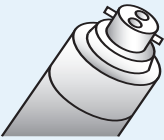
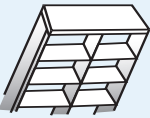
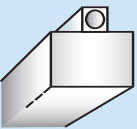
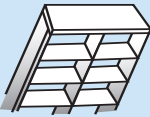
Upgrade any standard tungsten light bulbs to energy saving compact fluorescent lamps (CFLs) which use 75% less energy, produce less unwanted heat and last eight to ten times longer. Lighting technology advances very quickly and modern low energy bulbs that look attractive and provide good light output are now available. See the table below for some ideas on efficient options and where they might be appropriate.

## Occupancy sensors

An office where staff or cleaners work late may benefit from occupancy sensors. These help to ensure lights only operate when there is somebody there to require them. Sensors can achieve savings of up to 30% on lighting costs and are especially useful in:

- ▶ Storerooms
- ▶ Toilets
- ▶ Meeting rooms.

They are not appropriate for general office areas where people may not be moving frequently enough to be detected.

Existing lamp type	Energy efficient option	Energy saving/benefits	Application notes
 <p>Tungsten light bulbs</p>	 <p>Replace with compact fluorescent lamps (CFLs) in the same fitting</p>	75% saving plus longer lamp life	Modern CFL replacements may also be acceptable for display and task lighting
 <p>38mm (T12) fluorescent tubes in switch-start fittings</p>	 <p>Replace with equivalent 26mm (T8) triphosphor fluorescent tubes of lower wattage</p>	8% saving plus longer lamp life	General lighting, but even better use with modern fittings (see below)
 <p>Mains voltage reflector lamps, filament spot and flood types</p>	 <p>Replace with low-voltage tungsten halogen lighting or metal halide discharge lighting</p>	30-80% saving for equivalent lighting performance	Spot lighting in considered areas, such as reception or displays. If low voltage tungsten halogen spotlights are installed use 35W infrared coated (IRC) bulbs instead of the standard 50W bulbs
 <p>Fluorescent fittings with the old 2ft 40W, and 8ft 125W fluorescent lamps</p>	 <p>Replace with efficient fittings using reflectors/louvres or efficient prismatic controllers with high-frequency electronic or low loss control gear</p>	30-45% saving with much improved lighting quality. The use of high frequency electronic control gear eliminates flicker, hum and stroboscopic effect	General lighting
 <p>Fluorescent fittings with opal diffusers or prismatic controllers which are permanently discoloured</p>	 <p>Replace with new prismatic controllers or replace complete fittings as above</p>	No reduction in energy consumption but increases the amount of light by between 30% and 60%	General lighting

## Daylight sensors

Light sensors or 'photocells' can be used to control artificial lighting when there is sufficient natural daylight. As daylight hours vary throughout the year, sensors help to provide closer control and thus, substantial savings. They can be particularly useful externally for lighting car parks or signage and can often pay back their costs in less than a year. Both types of control are sometimes combined with time switches.

## Switching in parallel

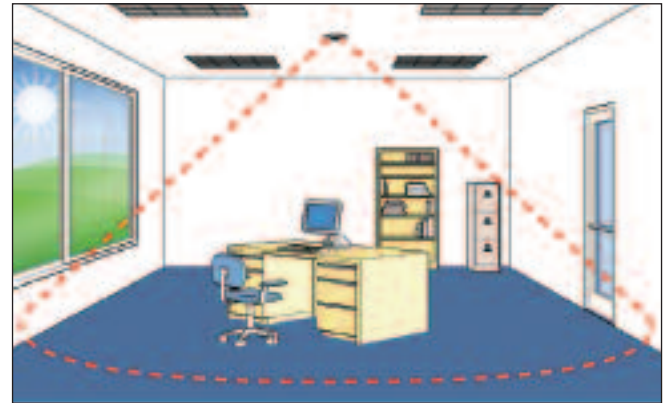
Consider wiring light switches to control lights that are parallel to windows. This enables staff to make the most of natural daylight without leaving those spaces further away from the windows in shadow. As a result, less lighting is used which reduces energy consumption. This also cuts additional heat generated by the lights meaning that less cooling is required.

Always consult a qualified lighting technician before upgrading lighting systems. If you are replacing or upgrading your lighting, you may qualify for an interest-free loan from the Carbon Trust – see page 15 for details.

*Use of an occupancy sensor with a photocell override to give the option of keeping lights off on bright days*



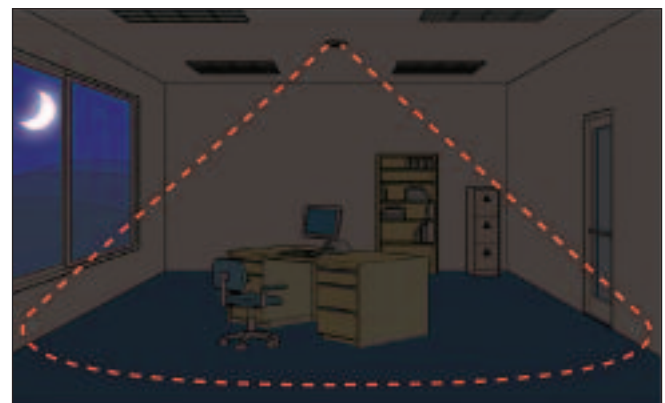
Enough daylight, occupied – lighting OFF



Enough daylight, unoccupied – lighting OFF



Night, occupied – lighting ON



Night, unoccupied – lighting OFF

## ▶ Heating

Heating accounts for 20-40% of energy costs in a typical office environment, which means that there are big opportunities to make savings. It is possible to minimise the cost of heating, regardless of which system is in place. Some businesses have shaved up to a third off their heating costs through the implementation of some simple energy saving measures.

### Obtain feedback from staff

Office workers usually have strong views about the internal temperature. This is valuable information, so encourage staff to report areas that are too hot, cold or draughty. Look for trends and investigate problem areas. There may be maintenance issues which, if addressed, will make workers less likely to bring in portable electric heaters and fans or to open windows whilst heating or cooling is on. It will also discourage staff from tampering with thermostats and may resolve disagreements.

### Consider comfort and temperatures

Most people feel comfortable in a temperature range of between 18-26°C, provided the temperature is in line with outdoor conditions. If it is cold outside, staff and visitors will typically be wearing warmer clothing, so ensure temperatures are set accordingly. Encourage staff to dress for the conditions and ensure workspaces are shielded from draughts and direct sunlight. These are no-cost solutions that save money and help maintain comfort.

The recommended temperature for offices and sedentary work is 21-23°C. However, when setting temperatures, remember that usually office heating is not set above 19°C. This is because internal heat gains from equipment and lighting will bring the temperature up to a level that most workers find comfortable. For more information on setting temperatures, see the top tip on page 10.

### Match working hours

Check that the system operating hours match the times when heating, ventilation and cooling are required, as needs vary throughout the day and in different seasons. Observe the working patterns and make adjustments to the controls.

A good first step is to use inexpensive time controls to automatically switch off the heating at the end of a typical work day. See the Controlling systems section, opposite, for more ideas.

#### fact:

– Reducing heating temperatures by just 1°C can cut fuel consumption in a typical office by 8% and save enough energy to print over 40 million sheets of A4 paper.

## Controlling systems

Many businesses find that controlling temperature is difficult. Some signs of poor control include:

- ▶ Heating being on when the building is unoccupied, because timers are not set correctly
- ▶ Heating being on too high or not high enough, because the thermostat is located where sunlight, radiators or office equipment affect its reading.

Often, simple adjustments to the location and setting of controls can reduce costs without affecting staff comfort.

Controls can affect the switching time, heating temperature or the system functioning, and range from simple to the very complex.

It is recommended to not rely on controls, but to ensure settings are reviewed every month or so to check that they are correct for the office usage and the season. Many systems function inefficiently because someone made a short term adjustment and then forgot about it.

For more information, see the *Heating control* technology guide (CTG002), available from the Carbon Trust.

## Keep systems clear and unobstructed

Radiators, fans and ducts should be clear of furniture and other obstructions. Keep fans and ducts clean and replace any filters at manufacturers' recommended intervals.

## Maintain boilers and pipe work

Have boilers serviced regularly by a reputable firm. Gas-fired boilers should be serviced once a year; oil boilers twice a year. A regularly serviced boiler can save as much as 10% on annual heating costs.

Boilers, hot water tanks, pipes and valves should be insulated to prevent heat escaping. Payback can usually be expected within a few months of installation, with additional savings in subsequent years.

There are many more savings to be found by optimising boilers. See the Carbon Trust's technology overview on *Low temperature hot water boilers* (CTV008) for more details.

## Upgrade controls

Heating system control can be problematic with old, inefficient time controls. Upgrades are well worthwhile implementing as they can pay for themselves very quickly through energy and cost savings.

Technology has made it possible for heating systems to adjust themselves in line with the changeable UK climate. A **compensator** is a form of control for heating systems that automatically regulates the heating temperature based on the weather. An **optimum start controller** learns how quickly the building reaches the desired temperature and brings the heating on at the optimum time prior to building occupancy, again depending on the weather.

These types of controls can save thousands of pounds and will pay back their investment in just a couple of years. Consult a qualified heating technician to discuss the range of options available.

## Consider a Building Energy Management System (BMS or BEMS)

A BEMS is based on a network of controllers and offers closer control and monitoring of building services performance, including heating, ventilation and air conditioning. This is shown on a computer screen in real time and allows settings to be changed quickly and easily. BEMS can reduce total energy costs by 10% or more so they are well worth considering in medium to large offices.

BEMS are discussed in detail in *Heating control* (CTG002).

### ▶▶▶ Tax incentives

Enhanced Capital Allowances (ECAs) enable businesses to buy energy efficient equipment using a 100% rate of tax allowance in the year of purchase. Businesses can claim this allowance on the investment value of energy efficient equipment, if it is on the Energy Technology List. The procedure for claiming an ECA is the same as for any capital allowance. For further information please visit [www.eca.gov.uk](http://www.eca.gov.uk) or call the Carbon Trust on 0800 085 2005.

## ► Ventilation and air conditioning

Ventilation using fans and ducting and the use of cooling, including air conditioning is becoming commonplace due to an increase in heat-gains from lighting, staff and office equipment. The more heat that is generated, the harder the ventilation and cooling systems have to work to maintain the desired temperature.

### Reduce the need

It takes energy to heat and cool the air inside an office. If that air is removed via a ventilation system, the money used to heat and cool it is also lost. The lost air then has to be replaced with the same amount of air from outside which needs to be heated or cooled to match inside temperatures – and that also costs money.

Reducing the need for heating and comfort cooling will reduce expenditure on ventilation.

### Take advantage of natural ventilation and free cooling to halve energy costs

As simple as it sounds, natural ventilation and cooling relies on natural air flow between openings on opposite sides of a room or building – or rising warm air being replaced with cooler air sucked in through windows or vents. It may be possible to use windows and doors to provide good levels of natural ventilation, allowing mechanical ventilation to be switched off or turned down to save money. When opening vents, doors and windows, always consider security implications.

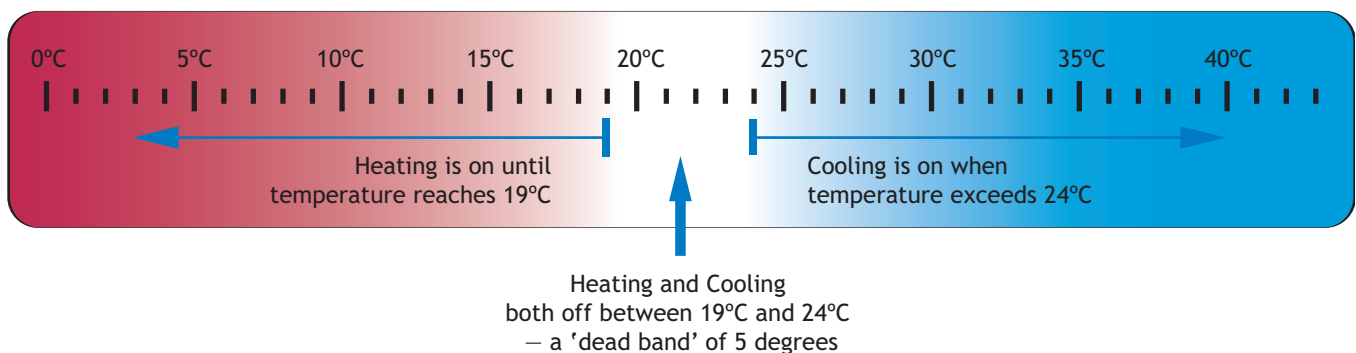
### Stay cool at night

Use the lower external temperatures at night to cool the building ready for the following day, thus delaying the switching on of air conditioning. This is known as 'night cooling'. Information on this topic can be found in the Carbon Trust's publication, *Heating ventilation and air conditioning* (CTV003).

### top tip:

**Don't let heating and cooling operate at the same time**  
This can be avoided by setting a temperature control 'dead band' – a wide gap between the temperatures at which heating and cooling cut in (see diagram below). In an office environment, the heating should switch off when a temperature of 19°C has been reached and cooling should not come on until the temperature exceeds 24°C.

Diagram of 'dead band' control providing recommended temperatures



## Maintain system components to ensure efficiency

Energy consumption can increase by up to 60% if regular maintenance is not undertaken. Dirty or faulty fans, air ducts and components directly affect system efficiency and will increase running costs and risk of breakdown. The performance of the whole system should be reviewed annually and replacement parts ordered as necessary. Always consult a maintenance technician.

The need for mechanical cooling will reduce if you control your heat gains – which can come from the sun or from lighting and equipment.

➤ **MYTH** – Leaving air conditioning on overnight reduces energy costs as the system stays at the required temperature.

**FALSE!** – The result is a much higher energy consumption than necessary.

**REMEDY** – An office only needs a fraction of overnight energy to reach adequate temperatures for the start of the day. Air conditioning may not be needed at all at this time if 'night cooling' is used (see page 10).

## Consider fitting variable speed drives (VSDs)

In an office ventilation system, fans often do not need to operate at full speed all of the time and VSDs can help to reduce costs by enabling the output speed of the fans to match requirements at different times of the day. This reduction in speed saves energy and there are corresponding heating and cooling cost savings too. The Carbon Trust can provide further information and advice on VSDs.

## Recover heat from exhaust air

It costs money to heat the air in a building – so why not recover some of that energy? The simplest way to recover the heat from exhaust air is to simply re-circulate a proportion of the exhaust air along with fresh air. More advanced solutions are available which allow the heat from the exhaust air to be used to pre-treat fresh incoming air. This is a worthwhile technology, but expert advice should be sought.

## Consider cooling options

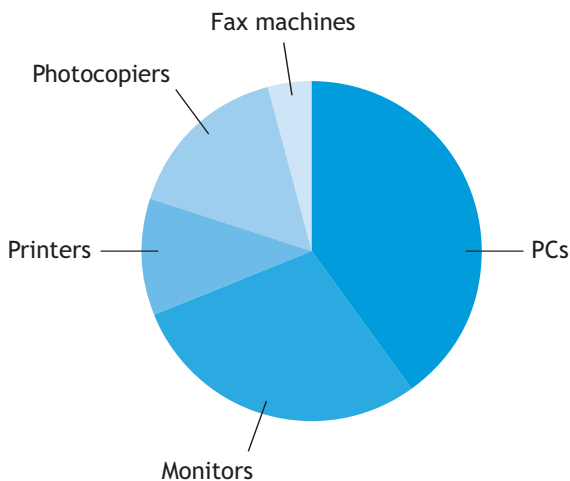
Full air conditioning is not usually required in UK offices, and should only be considered when careful control of humidity is also required. Cheaper cooling options are available and should be investigated before the decision to install full air conditioning is made. Using natural ventilation or night cooling techniques can reduce or eliminate the need for mechanical air conditioning, or there are options such as mixed-mode systems which can reduce energy use.

## ▶ Office equipment

Office equipment is the fastest growing energy user in the business world; the electricity it consumes represents 15% of total energy consumption in offices. This figure is expected to double by 2020.

As most equipment is often left on when not being used, there are opportunities to make significant savings.

The chart below shows the proportion of total energy used by office equipment in a small office.



Based on 10 PCs with monitors, plus 1 photocopier, fax machine and 1 laser printer, all with average consumption and no standby enabled.

### fact:

A computer and monitor left on 24 hours a day will cost around £45 a year. Switching them off out of hours and enabling standby features could reduce this to less than £10 a year and prolong the lifespan of equipment.

### Turn off and power down

Switch off all equipment when not in use and enable power down modes. As well as clearly reducing the energy consumption, it also reduces the heat produced by equipment which in turn, lowers cooling costs. Equipment lifespan will also be extended and maintenance costs and risk of breakdown should be reduced.

To take immediate steps and for some specific instructions, see *How to operate your office equipment efficiently* (CTL006), available from the Carbon Trust.

### Use the most appropriate equipment for the task

For internal printing, use a black and white printer. Set default printing to double-sided (duplex) and try to print in batches where possible to allow the machine to spend more time in standby than idling mode. Take care though; machines with a very deep-sleep mode can take longer to reach the right temperature which can result in staff disabling the standby feature, thereby missing out on savings.

### Minimise cooling loads

Place heat emitting equipment such as printers and photocopiers in a separate, naturally-ventilated area with good airflow. This helps minimise air conditioning costs and excessive noise. Colder areas on the north side of buildings are ideal.

### Maintain equipment for optimum performance

Printers, fax machines and copiers should be checked and cleaned regularly. Keep parts clean and free of dust and blockages and follow manufacturers' advice on servicing schedules in order to maintain optimum efficiency.

### Raise awareness

Most workers in this sector see equipment as a means to complete their jobs and do not put too much thought into the expense of running it. However it is an area that staff can affect directly, so awareness and training is very important. Staff should know about switch-off policies and be informed of the savings and improvements to working conditions they can achieve by taking responsibility.

The Carbon Trust's free publication, *Creating an awareness campaign* (CTG001), outlines an approach to making energy saving a priority for staff, with top tips and resources.

### Install plug-in seven-day timers

These can be bought for a few pounds from most DIY stores and will help to reduce the likelihood of machines being left on out of hours. Timers can be fitted to communal equipment such as printers, photocopiers and even vending machines, although it is advisable to check with your supplier first about how this may affect your service agreement.

### Purchase for your requirements

Choose equipment that caters for current business needs and predicted requirements only. Do not over specify – high spec PCs with large screens and fast processors use more energy; ask how many of your staff really need them. Always take running costs into account as well as initial purchase cost.

Ensure all new equipment has energy saving features meeting at least 'ENERGY STAR' performance specifications. This and other labelling schemes are discussed in the *Office equipment technology overview* (CTV005).

### Consider upgrading existing PCs

Some computers can simply be upgraded with newer, more energy efficient components. Look into this option before purchasing new machines. Flat screen (LCD) monitors can reduce monitor energy use by over two thirds. There are also obvious space advantages.

#### facts:

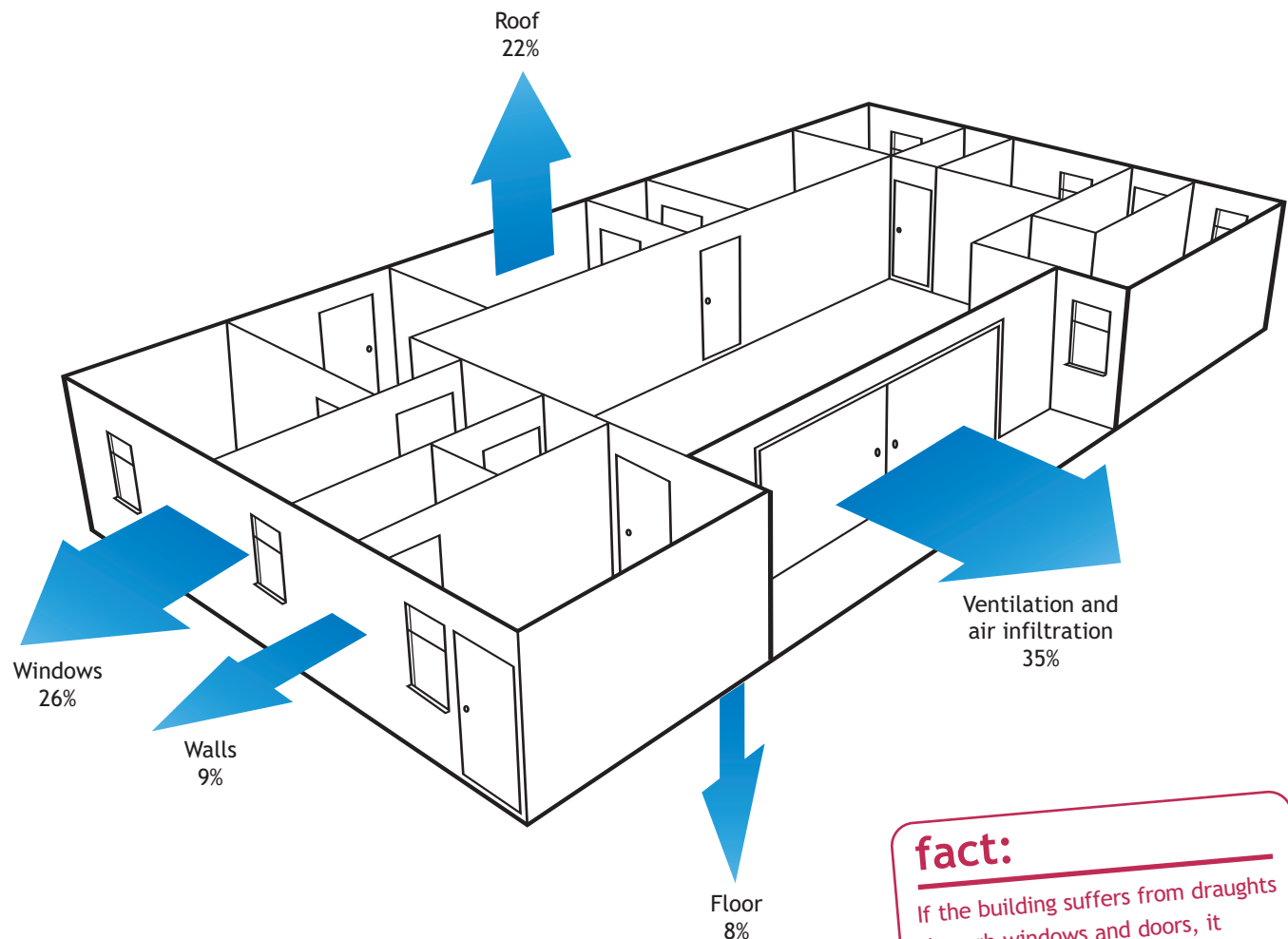
- Office equipment left on standby during bank holidays and weekends could cost small and medium sized office based businesses nearly £6000 over the course of a year
- The energy bill of a typical office based company could cost over 65% more than that of an equivalent energy efficient office.

## ▶ Building fabric

Improving an office's building fabric makes good sense for many reasons:

- ▶ Better temperature control – it can lower ventilation costs and prevent overheating
- ▶ Improved productivity – staff morale and output can be enhanced by providing a more comfortable working environment through reducing draughts, solar glare, overheating and noise
- ▶ Lower capital expenditure – a more efficient, well-insulated office needs smaller heating and cooling systems
- ▶ Good investment – better insulation can increase an office's value and attractiveness.

Typically, two thirds of heat in an office is lost through the building fabric, with the remaining third being lost through air infiltration and ventilation.



### fact:

If the building suffers from draughts through windows and doors, it is better to address these before improving the heating, ventilation or cooling systems.

## Undertake regular maintenance and avoid expensive problems later on

Maintaining buildings well means identifying potential problems and dealing with them promptly. In particular, gaps or holes in walls, windows, doors and skylights should be repaired immediately.

## Establish a housekeeping schedule and involve staff

Compile a checklist to address areas where energy is lost via the building structure. A comprehensive schedule should include regularly checking window panes and frames, roof lights and doors. The larger a building, the more beneficial it would be to appoint a staff member to carry this out. Ask staff to report any problems and ensure these are promptly repaired.

## Regularly check the building for damp

Damp causes significant damage to the building structure and reduces its insulating properties. Repair split down-pipes, faulty gutters and leaky roof tiles. Check for signs of damp and condensation at least once a year, preferably prior to winter months.

## Redirect heat and light from the sun

Overheating due to high levels of glazing is a growing problem in offices. Fit horizontal blinds or external shading to windows to direct light away from workstations and onto ceilings and walls. This will allow more daylight into the space, whilst minimising heat and glare from sunlight.

## Insulate to accumulate

25% of a building's heat will escape via an un-insulated roof, which adds hundreds, or even thousands of pounds per year to heating bills. Insulating any roof spaces and unfilled external cavity walls is an effective and inexpensive way of reducing heat losses.

## Gain control

The more complex a building is, the greater the need for a clear control strategy. The strategy should define how each service (heating, cooling and ventilation) is controlled. To be effective, controls need to be user friendly for managers and intuitive and accessible for occupants. Building control systems, coupled with building management policy have probably the most important influence on the energy performance of an office.

### ▶▶▶ Energy Efficiency Loans

The Carbon Trust can provide an energy efficiency loan\* to SMEs in England and Wales of up to £100,000 and to all businesses in Northern Ireland of up to £200,000 for investment in energy saving projects such as the upgrading or replacement of lighting, boilers or insulation. The loans are interest-free, unsecured, repayable over a term of up to four years and with no arrangement fees. In Scotland, the Scottish Executive offers a similar scheme called 'Loan Action Scotland'.

\*Subject to terms and conditions and local funding.

## ▶ Good housekeeping and people solutions

Savings are easily achievable in all offices and need not require any initial outlay. Many opportunities are within the control of staff which is an ideal way of involving people and raising awareness of the importance of reducing energy consumption.

Everyone should be reminded that good energy management helps to achieve:

- ▶ Environmental benefits
- ▶ Healthier and more productive working conditions
- ▶ Cost savings
- ▶ An enhanced corporate image which can be promoted to shareholders.

Whether starting an energy conservation programme from scratch or simply checking the effectiveness of an existing management system, there are a number of basics to consider.

### Responsibility and commitment

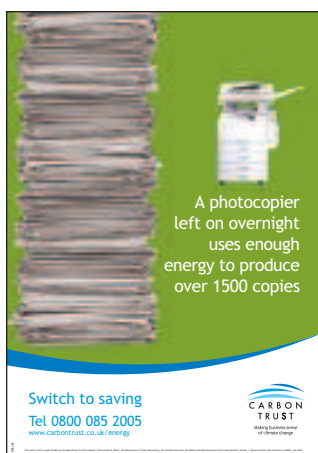
Commitment to energy efficiency has to come from the top and should be backed up by a personalised mission statement and energy policy. It is also important to appoint an 'energy champion'. In very small businesses, this may be the owner or manager but in larger companies, appointing a staff member will often improve involvement and awareness across the whole company.

### Involve staff

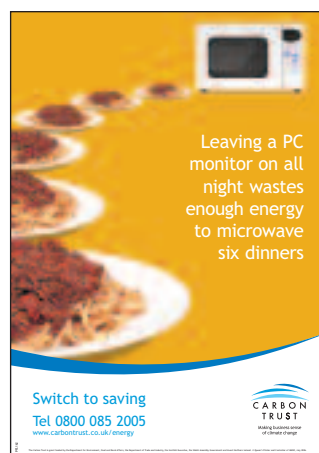
All staff members are important in saving energy so they must be made aware of wastage areas and be trained to operate equipment and controls correctly. Motivate staff – ask their opinions and encourage them to review their own working practices to increase energy savings. Competitions, campaigns and team projects are great ways to get buy-in. Reinforce the benefits of improving their work area and give them a sense of ownership of energy management.

The Carbon Trust's publication *Creating an awareness campaign* (CTG001) includes a staff survey, useful tips, and examples of posters and stickers that can increase awareness.

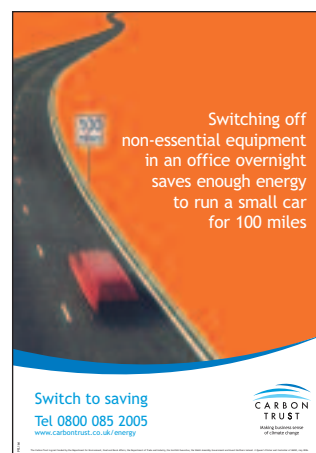
### Examples of free posters available from the Carbon Trust



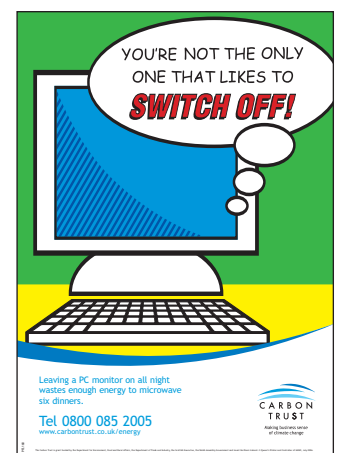
PFL161



PFL162



PFL164



PFL168

## Undertake regular housekeeping walk rounds

Note down and act on any maintenance measures needed in order to avoid expensive problems later on. As patterns of energy use vary throughout the day, it is advisable to carry out a series of walk rounds at different times to get a better idea of where and when energy is being wasted. A walk round helps to:

- ▶ Establish current operating practices
- ▶ Eliminate wasteful practices and ensure they do not recur
- ▶ Demonstrate commitment to improving energy performance
- ▶ Identify opportunities for savings
- ▶ Involve staff and raise awareness of the importance of reducing energy consumption.

An extensive checklist and guidance is available from the Carbon Trust: *Assessing the energy use in your building* (CTL003).

## Monitor energy use

Understand your energy consumption by reviewing energy invoices over the last year – you should be able to build a picture of your monthly performance. Larger companies generally have meters recording half-hourly electricity consumption and this data should be available from your energy supplier for comparison with your bills. However, if your office does not have half-hourly electricity meters, you should check and record monthly meter readings yourself. It is also advisable to check and record your monthly gas consumption in the same way.

### Examples of free stickers available from the Carbon Trust



# Action checklist

✓	Action	Savings
<input type="checkbox"/>	Switch off all non-essential lighting out of business hours (Page 4)	10% of lighting costs
<input type="checkbox"/>	Install photocell controls to switch off some lighting on brighter days (Page 7)	20% of lighting costs
<input type="checkbox"/>	Replace traditional tungsten lamps with energy efficient, compact fluorescent lamps (CFLs) to reduce operating and maintenance costs (Page 6)	75% of tungsten lighting costs
<input type="checkbox"/>	Experiment with switch-on and switch-off times for heating and air conditioning and switch off before the end of the working day (Page 8)	20% of heating and cooling costs
<input type="checkbox"/>	Ensure thermostats are set correctly – increase temperature set-point for cooling and reduce set-point for heating (Page 8)	A 1°C reduction in temperature during the heating season can cut costs by 8%
<input type="checkbox"/>	Set a gap or 'dead band' between heating and air conditioning control temperatures of about 5°C to avoid them operating at the same time (Page 10)	10% of heating and cooling costs
<input type="checkbox"/>	Turn off unnecessary equipment during the day and especially out of hours to reduce heat build-up and unnecessary electrical costs (Page 12)	5% of energy costs
<input type="checkbox"/>	Check insulation levels and increase wherever practical to reduce heating requirements (Page 15)	5% of energy costs
<input type="checkbox"/>	Walk around your office at different times of the day and during different seasons to see how and when heaters and coolers are working. Check time and temperature settings (Page 17)	5% of heating costs

## Next steps

There are many easy low and no-cost options to help save money and improve the operation of your office.

### ▶ Step 1. Understand your energy use

Look at your office and identify the major areas of energy consumption. Check the condition and operation of equipment and monitor the power consumption over, say, one week to obtain a base figure against which energy efficiency improvements can be measured.

### ▶ Step 2. Identify opportunities

Compile an energy checklist. Walk around your office and complete the checklist at different times of day (including after hours) to identify where energy savings can be made. An example checklist is shown opposite, or get further ideas about walk rounds from the Carbon Trust's fact sheet, *Assessing the energy use in your building* (CTL002).

### ▶ Step 3. Prioritise your actions

Draw up an action plan detailing a schedule of improvements that need to be made and when, along with who will be responsible for them.

### ▶ Step 4. Seek specialist help

It may be possible to implement some energy saving measures in-house but others may require specialist assistance. Discuss the more complex or expensive options with a qualified technician.

### ▶ Step 5. Make the changes and measure the savings

Implement your energy saving actions and measure against original consumption figures. This will assist future management decisions regarding your energy priorities.

### ▶ Step 6. Continue to manage your business for energy efficiency

Enforce policies, systems and procedures to ensure that your business operates efficiently and that savings are maintained in the future.

## Related publications

The following publications are available from the Carbon Trust

### Fact sheets and how to guides

*Understanding your energy consumption* (CTL001)

*Assessing the energy use in your building* (CTL003)

*How to operate your office equipment efficiently* (CTL006)

### Technology overviews

*Office equipment* (CTV005)

*Heating, ventilation and air conditioning* (CTV003)

### Technology and management guides

*Heating control* (CTG002)

*Creating an awareness campaign* (CTG001)



## For further information...

### ▶▶▶ call the Carbon Trust on 0800 085 2005

You'll find free advice on what your organisation can do to save energy and save money. Our team handles questions ranging from straightforward requests for information to in-depth technical queries about particular technologies and deals with all kinds of energy saving topics for people at all levels of experience.



### ▶▶▶ [www.carbontrust.co.uk/energy](http://www.carbontrust.co.uk/energy)

All of our publications are available to order or download from the Carbon Trust website at [www.carbontrust.co.uk/energy](http://www.carbontrust.co.uk/energy). The site provides a range of information suited to every level of experience including top tips, action plans, forthcoming events and details of the range of services available from the Carbon Trust.



### ▶▶▶ receive free publications

The Carbon Trust has a comprehensive library of energy saving publications. For more information on your sector, technologies within your sector and the technologies listed in this guide, please visit our website or phone us.



[www.carbontrust.co.uk/energy](http://www.carbontrust.co.uk/energy)  
0800 085 2005

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Making business sense  
of climate change

CTV007