

CTV025

Sector Overview



# Primary healthcare

Caring for budgets  
through energy efficiency



Making business sense  
of climate change

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Reducing energy use makes perfect business sense; it saves money, enhances 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 the primary healthcare sector introduces the main energy saving opportunities found in healthcare practices and demonstrates how simple actions save energy, cut costs and increase comfort for patients.

# Introduction

Improving energy efficiency in healthcare is about making the most of the energy that is used – without compromising the comfort or safety of patients and staff.



The UK's healthcare sector spends more than £400 million per year on energy. Unfortunately, a significant proportion of this is wasted, meaning that money is wasted too. Implementing a few simple techniques can help to reduce the amount of energy consumed in a healthcare practice which releases funding for use elsewhere. Furthermore:

- ▶ Energy-efficient buildings provide better indoor conditions for patients and staff
- ▶ Surgeries can publicise their energy-efficiency achievements to stakeholders and the local community
- ▶ The environment will benefit from reductions in carbon emissions and energy use, which helps to preserve fossil fuels and minimise climate change.

A significant number of primary healthcare units are already feeling the value of these benefits.

## Who is this publication for?

This publication is for anyone who is responsible for facilities or budgets in the primary healthcare sector. Focusing on low and no-cost measures with quick paybacks, this overview will help managers to:

- ▶ Assess the potential for energy saving, highlighting key areas for improvement
- ▶ Raise staff awareness and motivate action
- ▶ Prioritise energy saving activities to maximise savings.

### DID YOU KNOW?

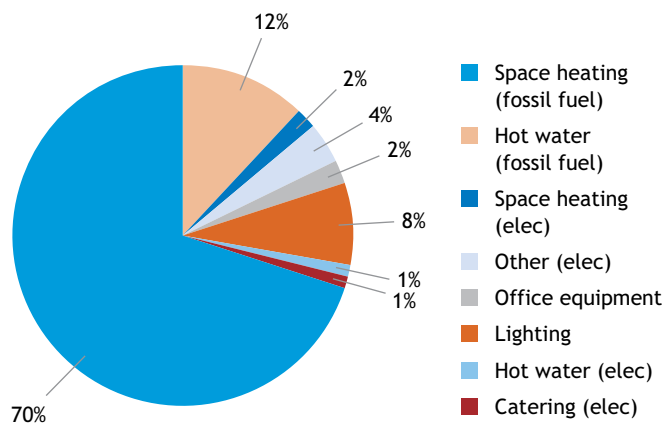
In an average GP's practice, an annual energy saving of up to 20% can be achieved with little investment. That equates to cost savings of around £2,000 per year.

# Energy consumption

Energy consumption in the healthcare sector is growing steadily. The sustained use of specialist medical equipment which generally relies on electricity to operate only adds to escalating costs. This means that budgets are being stretched.

The good news is that there are many opportunities to save energy and money just by implementing a few simple measures. Some key techniques are outlined in this overview and the chart below details where the biggest savings can be made: in heating, hot water, lighting, ventilation and the effective use of electrical equipment.

**Figure 1** Percentage energy use in primary healthcare



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

**Switching off** – turn off all energy consuming equipment when not required. This can be done by staff, or through automatic control systems.

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

**Refurbishment and investment** – energy saving measures taken when planning major refurbishment and investment can be extremely cost effective and pay back for years to come.

## *Enco<sub>2</sub>de 2006*

*Enco<sub>2</sub>de* and its accompanying CD-ROM provides fundamental guidance on energy efficiency in NHS healthcare facilities. It is a one-stop shop for all issues relating to the procurement and management of energy in the NHS and features technical guidance beyond the scope of this publication. *Enco<sub>2</sub>de* is not prescriptive and draws together best practice guidance so that healthcare organisations can determine a way forward that best suits their situation.

*Enco<sub>2</sub>de* is funded by the Carbon Trust and written by the Building Research Establishment (BRE) as a collaborative project between the Department of Health, NHS Scotland Property and Environment Forum, Welsh Health Estates and Northern Ireland Health Estates.

This publication and its accompanying CD-ROM is available to purchase from TSO (The Stationery Office). Visit [www.tsoshop.co.uk](http://www.tsoshop.co.uk) for ordering information. NHS trusts in England and all UK government departments can download core guidance (HBNs, HTMs etc) free of charge from the Estates Knowledge and Information Portal (KIP).

A free synopsis is available to download from the Carbon Trust website: *Health Technical Memorandum: Enco<sub>2</sub>de* (CTC605).

### top tip:

Set aside money saved from no and low-cost energy-efficiency improvements to fund more expensive measures.

# Opportunities for energy saving

## ▶ Heating and hot water

Heating is usually the biggest energy-user in the primary healthcare sector. Taking opportunities to minimise waste does not mean compromising staff or patient comfort.

Costs can be reduced by maintaining appropriate internal temperatures and ensuring that heating equipment and controls are operated and managed correctly. In fact, up to 30% can be saved on heating costs through the implementation of some basic energy saving measures.

### Heating

#### Obtain feedback

Encourage staff to report any areas that are too hot, cold or draughty. Investigating problem zones can help to identify maintenance issues. If these issues are addressed, staff members are more likely to keep reporting problems, rather than take matters into their own hands – such as by opening windows whilst heating or cooling is on or bringing in portable electric heaters or fans.

#### Appropriate internal temperatures

Temperature settings should reflect the activity taking place in the area. Below are recommended temperatures for specific areas common to primary healthcare facilities.

Room type	Temperature °C
Circulation spaces	19-24
Consulting/treatment rooms	22-24
Nurses' stations	19-22

#### ! Safety first!

Remember: patient welfare comes first, so seek further guidance before turning heating down.

#### Check controls to ward off energy wastage

Ensure system operating hours match the times when heating, ventilation and cooling are required, as needs vary throughout the day. Use simple time switches in smaller spaces such as treatment and consulting rooms, to help to automate this process so that nobody forgets.

As part of ongoing maintenance, review time settings every month or so to check that they are correct. Many systems function inefficiently because someone made a short-term adjustment and then forgot about it. A good example of this might be surgeries with late night opening hours once or twice a week. Although heating or cooling may be required during these extra hours, building services should revert back to normal operating times on the other days to avoid unnecessary consumption.

#### Keep systems clear and unobstructed

Primary healthcare units are busy places and medical equipment and furniture are often moved around to accommodate patients' needs. Where this occurs, make sure any radiators and vents are not obstructed by furniture or equipment and keep any filters clean. This ensures better circulation of heat into the space and reduces the energy required to meet the heating demand.

#### fact:

Control heating temperatures and provide adequate ventilation – hot and stuffy waiting areas can compromise health by promoting microbial growth.

## Keep external doors closed

Easy access to a healthcare building is a necessity for patients at any time of day or night; however, open doors allow warmed air to escape and cold air to enter. The thermostat then senses a temperature decrease and automatically switches on heating which may be unnecessary. The same happens with cooled air in warmer months. Try to keep external doors open only when absolutely necessary, or:

- ▶ Install automatic doors to help to retain the inside temperature while ensuring easy access
- ▶ Install a draught lobby to reduce the amount of hot or cool air lost through open doors.

Lobbies should be large enough to provide unrestricted access and enable one set of doors to be closed before the other is opened. Where possible, the two sets of doors should have automatic control. As well as minimising air loss, this will be appreciated particularly by less-mobile patients.

## Maintain boilers and pipework

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

Insulate boilers, hot water tanks, pipes and valves to prevent heat escaping. Payback can usually be expected within a few months of installation, with additional savings in subsequent years. More information is given in the Carbon Trust's publication *Low temperature hot water boilers* (CTV008).

## Controlling systems

Often, simple adjustments to the location and setting of controls can reduce costs without affecting staff and customer comfort. Some signs of poor control in healthcare buildings include:

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

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

Discourage staff from using thermostats as on/off switches. Turning them to maximum does not speed up the heating process, it just results in an overheated space.

## A simple thermostat set at 19°C



## Localise control with TRVs

A thermostatic radiator valve (TRV) is a simple device with an air temperature sensor, used to control the heat output from a radiator by adjusting water flow. Correctly fitted and operated TRVs can provide efficient temperature control in areas which have sporadic usage patterns, such as treatment and consulting rooms.

## Upgrade controls

Regulating heating with old controls can be problematic. Upgrades are well worthwhile implementing as they can pay for themselves very quickly through reducing energy waste and therefore saving money.

Sophisticated heating systems can adjust themselves in line with the changeable UK weather. A **compensator** is a form of control for heating systems that automatically regulates the heating temperature based on outside conditions. 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.

- ▶▶▶ To order publications on heating, contact the Carbon Trust (details can be found inside the back cover).

## Hot and cold water

Hot and cold water costs within a healthcare practice can be considerable. This is made worse when water is wasted as the energy used to heat it has been wasted too. Water is a metered and controllable resource and it is possible to save up to 50% on water costs by implementing some inexpensive efficiency measures.

### Consider water-saving devices

The largest areas for potential savings are through the installation of water-conserving devices such as:

- ▶ Push taps – only operate when pressed; turn off after brief time period. These are usually easier for disabled patients to operate too
- ▶ Spray taps – reduce volume of water coming out of a tap
- ▶ Toilet cistern dams – reduce volume of water used during flush
- ▶ Urinal flush controls – reduce unnecessary flushing.

Below is an estimate of how long simple measures will take to pay back their purchase cost.

Measure	Annual saving	Payback (years)
Tap restrictors	Typically reduces water flow by 15%	1
Urinal flush controls	Typical savings of 10% per toilet	<1
Toilet cistern dams	Typical savings of 20% per toilet	<1

## Supply efficiently

It is inefficient to supply isolated and infrequently-used hot water taps from a central hot water storage tank because of heat loss from long pipe runs. Consider installing a point-of-use water heater in such cases.

Efficient delivery and usage of water will result in water and energy savings. To minimise water consumption, automate controls wherever possible.

## Regular maintenance

Maintain water services including taps, storage facilities and pipework on a regular basis and ensure all drips are fixed immediately. Check for water vapour, flooded ducts and corrosion around joints or fittings on pipework. If a water leak is underground, it may be harder to spot, so read water meters regularly.

Encourage staff to report any issues such as dripping taps, overflowing cisterns and inefficient water-saving/flushing devices in toilets so they can be repaired before the problem escalates.



## ► Office equipment and specialist apparatus

Electrically-powered equipment can account for as much as a quarter of total electricity use within healthcare organisations. As some equipment is often left on all day, even when not being used, there are significant opportunities to make savings.

IT equipment, small appliances and special medical machines are common in primary healthcare organisations. Some general measures are outlined below but always check with an expert before switching off or altering controls, particularly on specialist healthcare equipment.

### Turn off and power down

When equipment is not being used and it can safely be switched off, do so. Ensure any power saving modes are enabled to reduce energy consumption and heat production. This will also reduce the risk of overheating in a space, thereby improving staff and patient comfort. An added benefit is that equipment is likely to last longer.

### Seven-day timers

Plug-in seven-day timers cost only a few pounds from DIY stores but they have a big impact in reducing the likelihood of machines being left on out of hours. They are best fitted to communal equipment such as photocopiers, printers and vending machines that do not contain perishables. Check with equipment suppliers first about any service agreements, particularly on vending machines.

### Simple actions in the office

Most office equipment has a standby or idling mode which can be activated to save energy. Take care though; machines with a very deep-sleep mode can take longer to reach the right temperature, frustrating users and increasing the risk of the feature being disabled. Another straightforward action is setting PCs to automatically print double sided (duplex) and encouraging staff to print in batches so the printer can stay in standby for longer.

Place heat-emitting office equipment such as printers and photocopiers in a separate, naturally-ventilated area with good airflow. This helps prevent overheating, removes potential emissions from the equipment and reduces the affect of noise. Colder areas on the north side of buildings are ideal.

### Maintain equipment for optimum performance

Check and clean all heat-emitting equipment regularly. Keep parts and any filters clean and free of dust. This is not just to improve cleanliness and appearance – dirt can reduce the effectiveness of apparatus and affect its cooling down process. Seek advice from the manufacturer on servicing schedules in order to maintain optimum efficiency.

### Purchase for your requirements

Choose equipment that meets current and predicted requirements. Selecting office equipment can be more straightforward than medical equipment as there are no patient care issues to consider and there is more information available on the efficiency of apparatus. Do not over-specify as high-performance office and specialist electrical equipment can use more energy and may not be necessary. See the box below for more information about specialist apparatus.

With healthcare units under increasing pressure to spend budgets wisely, it makes sense to work out the whole life-cost of the item, that is the capital cost plus the running costs in energy over the lifetime of the equipment. Ensure purchasing policies consider the energy consumption of apparatus rather than just the initial capital outlay. The energy saved by more efficient models can pay back higher purchase costs quickly. For more information, and for details on how to prepare a purchasing policy, see the Carbon Trust's overview on *Energy management strategy* (CTV022).

### Specialist apparatus

Healthcare facilities usually have a significant amount of energy-intensive, specialist equipment. Because each item requires careful evaluation due to the potential risks to the welfare of patients, this publication does not extend to information about medical apparatus.

Careful purchasing, along with maintaining good housekeeping practices can generally keep consumption to a minimum.

## ► Ventilation and air conditioning

Ventilation systems are necessary to maintain correct conditions and patient comfort. However, it is possible to reduce the amount of energy that they consume by focusing on some key energy saving opportunities.

Ventilation is required not just to combat heat gains from lighting, people and specialist equipment, but more importantly, to provide fresh air which helps to eliminate airborne bacteria.

Some of the actions below will assist in simply cooling the premises,<sup>1</sup> whilst others will provide air changes. Remember that a certain level of ventilation for infection control is paramount in healthcare buildings. Always seek professional advice before making alterations to any ventilation systems.

### Take advantage of natural ventilation

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 in some areas of a health centre, allowing mechanical ventilation to be switched off or turned down to save money. When opening vents, doors and windows, always consider security implications.

### ! Safety first

Because of the risk of infection through ventilation and cooling systems, always seek specialist advice before making any changes.

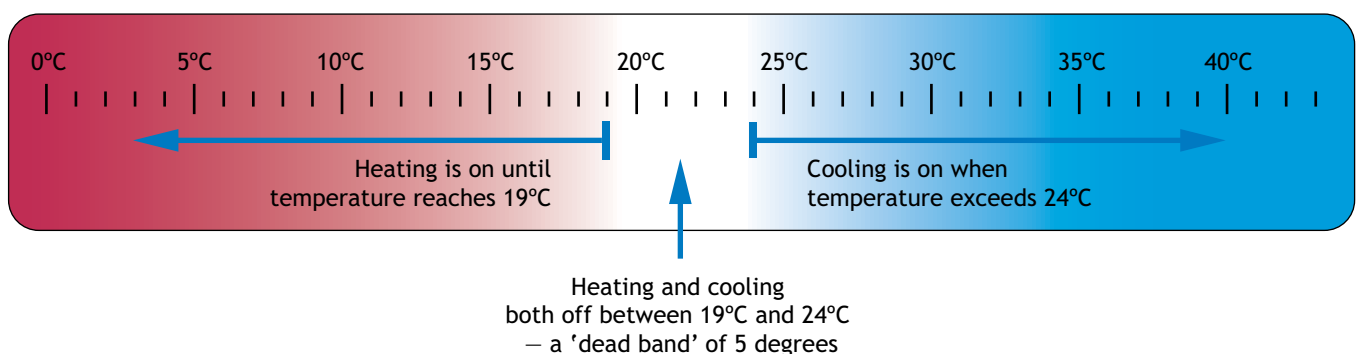
### Maintain system components

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 to keep the system effective, clean and safe.

### Set a dead band

Avoid heating and cooling operating at the same time by setting a temperature 'dead band' – a wide gap between the temperatures at which heating and cooling cut in. For example, Figure 2 below shows how, in a healthcare reception area, the heating may be set to switch off when a temperature of 19°C has been reached and cooling would not come on until the temperature exceeds 24°C.

**Figure 2** Diagram of 'dead band' control providing recommended temperatures



<sup>1</sup> The true definition of an 'air conditioning system' is one which has the ability to control temperature, humidity and air quality within precise limits, yet the term is often applied to systems which simply cool the space. These cool air systems are more correctly referred to as 'comfort cooling'.

## 'Mixed mode' systems

Some healthcare centres have 'mixed mode' systems which use a combination of both natural and mechanical ventilation. The natural option for ventilation, heating and cooling is always used where possible, with mechanical systems employed only when absolutely necessary. There are various advantages of such a system:

- ▶ The building becomes more adaptable to a wide range of requirements
- ▶ The occupants have more control over their environment
- ▶ Health centres can cut down on energy spend and carbon emissions.

Actions on air conditioning are discussed further in the Carbon Trust's *Air conditioning* technology guide (CTG005).

## Variable speed drives (VSDs)

Fans do not need to operate at full speed all of the time and variable speed drives (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.

### DID YOU KNOW?

Fan power requirements are high in buildings that are poorly insulated and draughty, because of the need to distribute larger volumes of air. Improving your insulation can help to reduce this need. See the Building fabric section on page 12 to find out more.

➤ **MYTH** – Turning air conditioning thermostats as low as they can go cools the building more quickly.

**REALITY** – The temperature drops at the same rate but then overshoots, using more energy than necessary and creating discomfort for building occupants. If controls are not coordinated, the temperature could even go low enough for the heating system to be switched on. Both systems then operate at the same time.

**REMEDY** – Set thermostats correctly and educate staff to dispel this myth. As a last resort, protect thermostats to prevent tampering, where possible.

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

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

**REMEDY** – A building 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.

### DID YOU KNOW?

To save money and increase comfort, it is better to reduce the amount of heat produced in an area than to raise ventilation rates. Don't be afraid to ask – if you are concerned that your system isn't operating correctly, or if staff complain about draughts from ventilation fans, talk to your maintenance technician.

## ▶ Lighting

Healthcare professionals cannot compromise on lighting as it is essential for staff to carry out their work properly. Yet a few simple measures can save energy and costs, without putting patients at risk.

### 'Switch off' policy

Ensure all unnecessary lighting is switched off. All staff can do this, so raise awareness by bringing up the issue in meetings and placing stickers above light switches and posters around the building. Some materials are available from the Carbon Trust.

Assign responsibility to a specific staff member to check lighting around the building at set times of the day. For example, every morning to check that external lights are off when there is sufficient daylight.

### Label light switches

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

### ! Safety first

The lighting of healthcare buildings requires the designer to be familiar with a wide range of light sources and lamp types. Normal standards and methods of lighting may not be appropriate in some building areas, so the most suitable system should be sought. Always seek professional advice before making any drastic changes.

*Examples of modern, attractive low-energy bulbs – trial a few different types to see which best suit your premises.*



### Maintenance

Keep windows, skylights and light fittings clean. Replace old, dim or flickering lamps and keep controls in good working order by ensuring timers are set correctly and that any occupancy sensors are clean. Without regular maintenance, light levels can fall by up to 30% in 2-3 years.

Encourage staff to report maintenance issues. This will help maintain the desired light output and, in turn, provide a safer, more attractive environment for both staff and patients.

### Install low-energy lighting

Upgrade any 'standard' tungsten light bulbs to energy saving compact fluorescent (CFL) bulbs which use 75% less energy, produce less unwanted heat and last 8-10 times longer.

Replace blackened, flickering, dim or failed fluorescent tubes with triphosphor coated ones (this is stated on the packaging). Triphosphor 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.

Specify high frequency fluorescent lighting systems and mirror reflectors whenever fluorescent lighting is to be replaced. This should be included in purchasing policies for all healthcare buildings. High frequency tubes reduce energy use and heat output, eliminate flicker and hum, extend lamp life (by up to 50%) and can allow dimming – all of which can make a health practice more comfortable.

When purchasing new lights, specify equipment that appears on the 'Energy Technology List' to ensure it is efficient. Visit [www.eca.gov.uk/energy](http://www.eca.gov.uk/energy) for more information.

## Controls and sensing technology

Like heating controls, lighting controls make savings by automatically switching lights off when not required. Examples include time switches which are suitable for areas with regular hours and occupancy sensors which can be installed in intermittently occupied spaces such as toilets and storerooms. With all of these controls, it is possible to install a manual override.

Other useful devices are daylight sensors. Also called 'photocells', these can be set to switch off artificial lighting when there is sufficient natural daylight. As daylight hours vary throughout the year, sensors help to provide closer control and can achieve 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.

Photocells can also be combined effectively with time switches to ensure even more precise control. More information is available in the Carbon Trust's *Lighting* technology overview (CTV021).

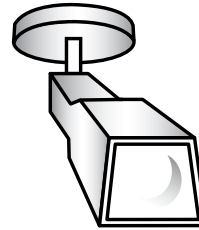
➤ **MYTH** – It is better to leave fluorescent lighting on as starting it up wastes more energy than if it remains permanently switched on.

**REALITY** – Fluorescent tubes use only a few seconds worth of power in start-up. Therefore, energy is always saved by switching lights off when leaving a room.

### DID YOU KNOW?

Good lighting design can also reduce internal heat gains, thus reducing the need for air conditioning.

## Sub-sector hint – Reception areas



### Low voltage spot lighting

Tungsten halogen spot lighting is increasingly being used to provide 'sparkle' in reception areas of health practices and dental surgeries. If these lights are on a low voltage circuit then savings can be achieved

by using 35W bulbs with an infrared reflective coating (IRC), instead of the standard 50W bulbs. The IRC reduces the power required to light the lamp but gives the same equivalent light output as a standard 50W bulb whilst achieving a 30% energy saving and a 60% heat reduction.

### fact:

Make the most of natural daylight. Bright sun-filled spaces help to create a relaxed feeling in waiting rooms. A pleasant, soothing and easily accessible environment can have a positive effect on patients' outlook and general sense of well-being.

## ▶ Building fabric

Inefficient building structures are prone to draught and insulation problems. Typically, two thirds of heat from a healthcare building is lost through the building fabric, with the remaining third being lost through air infiltration and ventilation.

The rate at which heat is lost depends on:

- ▶ The temperature difference between inside and outside
- ▶ The insulation properties of the building fabric
- ▶ The amount of fresh air entering the building either by controlled ventilation or through poorly fitting windows, doors or joins in walls.

Improving building fabric makes good sense for many reasons:

- ▶ Better temperature control – it can lower ventilation costs and prevent overheating
- ▶ Enhanced patient comfort – comfortable waiting and consulting rooms help put patients at ease
- ▶ 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 healthcare building needs smaller heating and cooling systems
- ▶ A brighter, cleaner environment – this may help increase patients' confidence in the care the unit is providing.

### **Undertake regular maintenance and building checks**

Identify potential problems and deal with them promptly as part of regular upkeep. In particular, repair gaps or holes in walls, windows, doors and skylights immediately. This provides instant savings and also improves the appearance of a building.

Compile a regular checklist to address areas where energy is lost via the building structure. Check that windows and external doors are closed wherever possible when heating is on. The larger a building, the more beneficial it would be to appoint trained staff to carry this out.

### **Regularly check the building for damp**

Damp causes damage to the building structure and reduces its insulating properties. It is also unsightly and even though it may not reflect the quality of the healthcare supplied, patients may be concerned by what appear to be dirty and unkempt premises.

Repair split down-pipes, faulty gutters and leaky roof tiles as soon as an issue becomes apparent. Do not just opt for a quick fix – repair the cause of it if possible and save time on expensive work later. Check for signs of damp and condensation at least once a year, preferably prior to winter months.

Identifying and repairing problems quickly can help avoid expensive problems later on.

## Keep the heat in

Consider sealing unused doors or windows to reduce draughts and insulate any accessible loft spaces. Also insulate hot water and heating pipes so that heat is not lost while travelling around the building. Moreover, insulating pipes can improve internal comfort by reducing the risk of overheating.

Regularly check that insulation is in good condition and replace if required.

## Use curtains and blinds

As well as providing privacy for patients, curtains and blinds play an important role in protecting the building. By closing them at, say, the end of the day, they can reduce draughts, helping rooms retain more of their residual heat overnight during winter months. They also keep the building cool during summer by repelling direct sunlight and therefore, heat gain.

Blinds can be an effective way of controlling daylight, glare and overheating problems. See the Carbon Trust's *Lighting* technology overview (CTV021) for more information.

### fact:

30% of energy consumed in the UK is wasted. This means that money is being wasted too which could be spent on improving healthcare buildings and facilities. Being energy efficient not only yields considerable cost savings but also minimises damage to the environment.

## Improve glazing

Double glazing is now a minimum requirement when replacing windows but specifying triple glazing on north-facing or exposed sides of a building can offer further comfort and energy savings. Some window units even have integrated blinds and/or allow for secure night opening, which can provide additional ventilation and cooling benefits.

High performance glass has a coating applied that improves its insulation properties. Coatings that allow daylight through but block or reduce heat (infrared) can be particularly effective at reducing overheating from direct sunlight, which can lower mechanical cooling requirements.

In highly glazed spaces such as waiting rooms and atria, it may be more effective to replace some of the glazing with insulated blank panels. This will reduce the amount of light entering the space but provide better insulation and reduce heat and glare problems associated with a large area of windows.

## Install more insulation during refurbishment

Up to a quarter of a building's heat will escape via an uninsulated roof, which adds hundreds 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.

More information on these and further actions can be found in the Carbon Trust's *Building fabric* technology overview (CTV014).

### Loft and pipework insulation



## ▶ Good housekeeping and people solutions

Good housekeeping can typically save 10% on energy bills.

Most energy saving opportunities are within the control of staff, so get everyone involved and committed to an energy management programme. Make it clear that their actions are important for the facility, the patients and their own comfort.

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 at all levels

Every member of staff has a part to play in minimising energy consumption. Establish a clear energy policy, have it endorsed by the board and communicate it to all employees. Consider appointing an 'energy champion' for the building as this will often improve involvement and awareness amongst staff.

### Involve staff

All employees 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.

### Run an awareness campaign

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. See the Carbon Trust guide to *Creating an awareness campaign* (CTG001) for more information and sample materials which can be used in your healthcare unit.

### Undertake regular housekeeping walk rounds

Carry out regular good housekeeping walk rounds. Note down and act on any maintenance measures needed in order to avoid expensive problems later on. Patterns of energy use vary throughout the day, so carry out a series of walk rounds at different times to spot any energy saving opportunities.

During a walk round, look at all parts of the building, including the heating, lighting, and building fabric, as well as any electrical equipment. A checklist can be helpful – why not devise a bespoke version from the list on the opposite page?

Find tips and a sample checklist in *Assessing the energy use in your building* (CTL003), available from the Carbon Trust.

### Monitor energy use

Understand your energy consumption by reviewing energy invoices over the last year. This should help you build a picture of the site's monthly performance. Larger health centres may have meters recording half-hourly electricity consumption and this data should be available from the energy supplier for comparison with your bills. Inspecting half hourly data is also a good way to see when (and sometimes where) energy is being used, and is an effective way to identify potential savings.

However, if the facility does not have a half-hourly electricity meter, at least check and record meter readings monthly. Gas readings can be checked in the same way. Doing so will provide basic data on consumption and ensure that bills are correct.

More information is given in the Carbon Trust's technology overview on *Metering* (CTV027).

### Set targets

Tell staff how much energy is currently being consumed. Then, when the energy saving programme gathers momentum, it will be possible to highlight energy savings. Set targets and produce an action plan to achieve goals. Most organisations in the UK could reduce their energy consumption by 10-40%. However, it is important to be realistic: many start by aiming for 5% savings each year.

### DID YOU KNOW?

It is possible to save 5-10% of a healthcare building's total energy costs by implementing some common sense, good housekeeping measures. Even better, energy savings made through good housekeeping yield immediate results and require no financial investment or specialist skills.



# Action checklist

Action	Progress
Set temperature controls to suit the space and only have heating on when needed	
Minimise heat wastage by closing doors and keeping radiators clear	
Maintain boilers and pipework for optimum performance	
Revise control options – consider optimum start, compensators and TRVs	
Fit water-saving devices	
Try to ventilate and cool using natural methods	
Check that heating and cooling are not operating at the same time	
Switch off all non-essential lights	
Find the most efficient lighting options	
Install controls – consider time switches, occupancy sensors and daylight sensors	
Turn off unused electrical and office equipment	
Consider life-cycle costs when purchasing equipment	
Check for heat loss through the building fabric including floors, walls, roofs and windows	
Repair gaps immediately so heated or cooled air does not escape	
Insulate as much as possible, including pipework	
Get all staff involved – write an energy policy and run an awareness campaign	
Monitor energy usage by checking meter data and bills	
Set targets and devise an action plan	

Contact the Carbon Trust for further guidance and support on improving energy use.

## Next steps

There are many easy, low-cost options to help save money and improve the energy performance of your healthcare building:

### ► Step 1. Understand your energy use

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

### ► Step 2. Identify your opportunities

Compile an energy checklist. Walk round your building to identify where energy savings can be made. Build a checklist based around the one on the previous page or use the one from the Carbon Trust publication: *Assessing the energy use in your building* (CTL003).

### ► 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 yourself but others may require specialist help. Discuss the more complex or expensive options with a qualified technician.

### ► Step 5. Make the changes then measure the savings

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

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

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

## Related publications

The following publications are available from the Carbon Trust:

#### Fact sheets

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

#### Technology overviews

*Building fabric* (CTV014)

*Heating, ventilation and air conditioning* (CTV003)

*Lighting* (CTV021)

*Low temperature hot water boilers* (CTV008)

#### Technology guides

*Heating control* (CTG002)

#### Management overviews and guides

*Creating an awareness campaign* (CTG001)

*Energy management strategy* (CTV022)

*Practical energy management* (CTV023)

#### Technical engineering guidance

*Health Technical Memorandum: Enco<sub>2</sub>de – Synopsis* (CTC605)

The full version of *Health Technical Memorandum: Enco<sub>2</sub>de* and its accompanying CD-ROM is available to purchase from the TSO. To order, visit [www.tso.co.uk](http://www.tso.co.uk)

## 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 library of energy saving publications. For more information on your sector, and on the technologies listed in this guide, please visit our website or phone us.



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The Carbon Trust is a UK-wide company, with headquarters in London, and bases in Northern Ireland, Scotland, Wales and the English regions.

The Carbon Trust is a private company set up by Government in response to the threat of climate change, to accelerate the move to a low carbon economy.

The Carbon Trust works with UK business and the public sector to create practical business-focused solutions through its external work in five complementary areas: Insights, Solutions, Innovations, Enterprises and Investments. Together these help to explain, deliver, develop, create and finance low carbon enterprise.

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Making business sense  
of climate change

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