



Retail

Energy management - the new profit centre for retail businesses



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Preface

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 retailers introduces the main energy saving opportunities for businesses within the sector and demonstrates how simple actions save energy, cut costs and increase profit margins.

Introduction

A 20% cut in energy costs can represent the same bottom line benefit as a 5% increase in sales.

Saving energy is one of the simplest ways to increase profits. In retail businesses, energy costs may only be a small percentage of turnover but reducing them can directly increase margins without the need to increase sales.

In addition to economic benefits, there are of course, social and environmental advantages to reducing energy consumption, such as preserving fossil fuel supply, cutting carbon emissions, and minimising climate change. Customers are increasingly aware of these issues and many are choosing retailers who are taking positive steps for the environment.

Who is this publication for?

Managers in most retail organisations – from local convenience stores to larger stores and supermarkets – can benefit from the advice in this publication. Focusing on low and no-cost measures and actions which will have the quickest payback, this overview demonstrates the best energy saving opportunities for retailers and will help managers to:

- Assess the potential for energy savings in-store and indicate key areas for improvement.
- Raise awareness of energy conservation amongst staff and motivate them to reduce waste.
- Appraise the overall performance of a store.
- Controlling energy usage will also make conditions more comfortable for staff and customers – and comfortable customers will want to spend more time in-store.

Energy consumption in retail

Although retail is a diverse sector, there are several areas where energy is commonly wasted.

The chart on right handside shows where retailers use most energy and where the biggest savings can be made: in lighting, heating, ventilation, air conditioning and refrigeration.

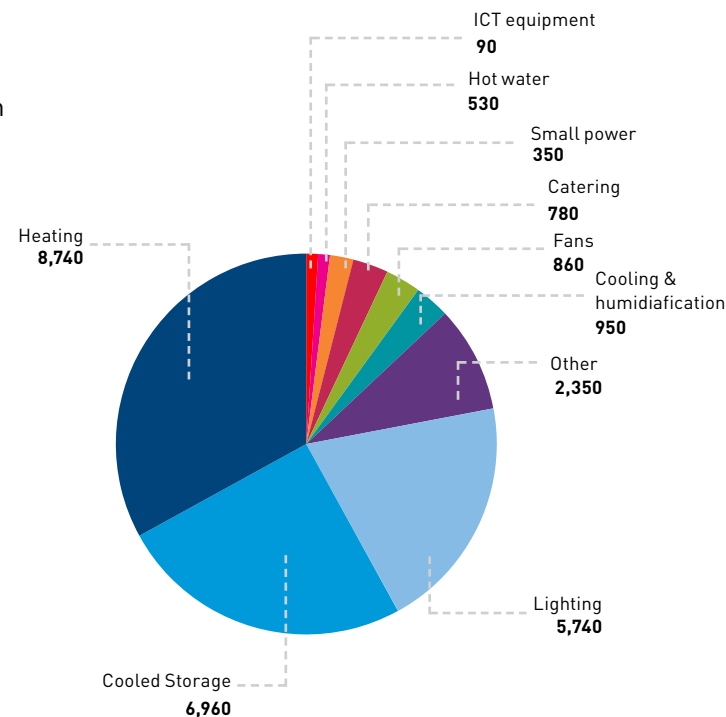


Figure 1 Breakdown of annual energy use in the average retail environment. (Building Energy Efficiency Survey 2016)

Note that proportions of energy use will vary according to the type of store. For example, food retailers tend to have higher refrigeration costs than shown here, while others will notice that their air conditioning costs are more significant.

In each of the highest consuming end uses, 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 – When planning major store refurbishment, energy saving measures taken at this time can be extremely cost effective.

Key opportunities for energy saving

Lighting

Low-to-no cost quick wins

The retail industry often demands bright, attractive lighting to draw customers and maximise sales but this is often not very energy efficient. There are, however, many simple and inexpensive ways to reduce the energy consumption and costs associated with lighting without compromising profit.

Lighting plays a critical role in the retail environment and has to satisfy a variety of business needs:

- General lighting to retail areas.
- Display lighting.
- Signage.
- Theme or mood lighting.
- Lighting for cleaning and stock replenishment.
- Security and safety lighting.
- External and car park lighting.

“Switch off” policy - involve staff and increase awareness

Staff at all levels should be involved in making savings by being encouraged to turn off light switches. This can be achieved by conducting regular meetings, placing reminder stickers above light switches and putting up reminder posters around in-store service areas (available from the Carbon Trust website). Light switches should also be clearly labelled to help employees know which ones they can turn off or which ones they need for the work being carried out (for example when cleaning or restocking the store out of hours). Lights in unoccupied areas should always be switched off but remember to consider health and safety implications, particularly in corridors and stairwells.

Maintenance

Lighting is essential for providing a pleasant shopping and 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 trading hours and that occupancy sensors are clean. Without regular maintenance, light levels can fall by at least 30% in 2-3 years. Establishing a basic lighting maintenance programme can reduce costs by up to 15% as well as improving in-store appearance.

Invest in Sensors

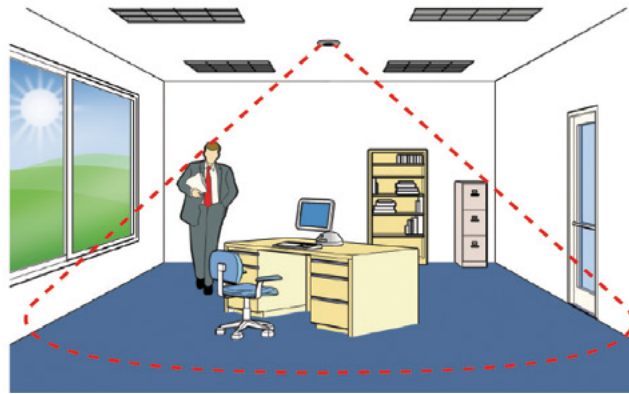
Occupancy sensors

A store where cleaning or security staff work late would benefit from occupancy sensors. These automatically turn lights on when there is somebody there to require them and turn them off after a period of vacancy. Sensors can achieve savings of up to 50% on lighting costs and are especially useful in:

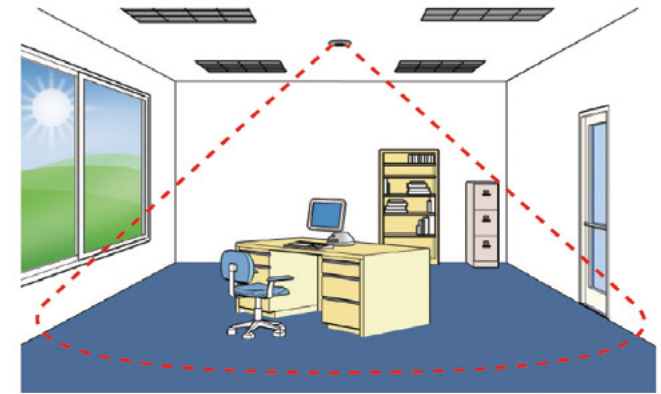
- Stockrooms and storerooms.
- Toilets.
- Meeting rooms.
- Areas where lighting is zoned.

Daylight sensors

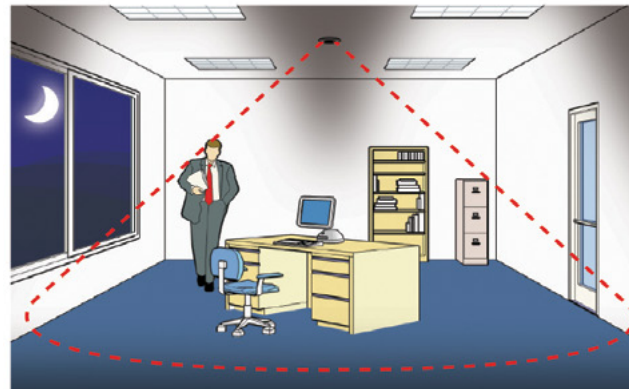
Light sensors or 'photocells' can be used to dim or turn off artificial lighting when there is sufficient natural daylight. As daylight hours vary throughout the year, sensors help to provide closer control and thus, substantial savings. They can be particularly useful externally for lighting car parks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



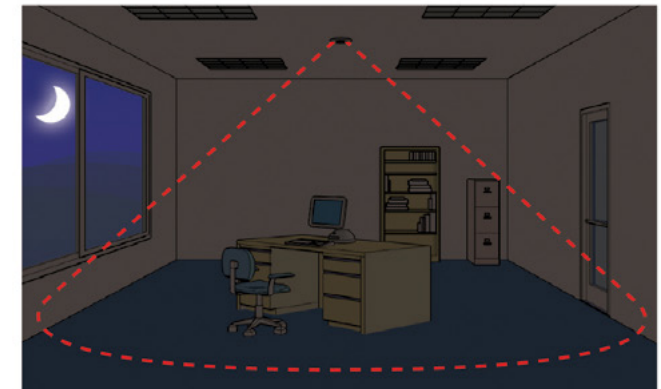
Enough daylight, occupied - lighting OFF



Enough daylight, unoccupied - lighting OFF



Night, occupied - lighting ON

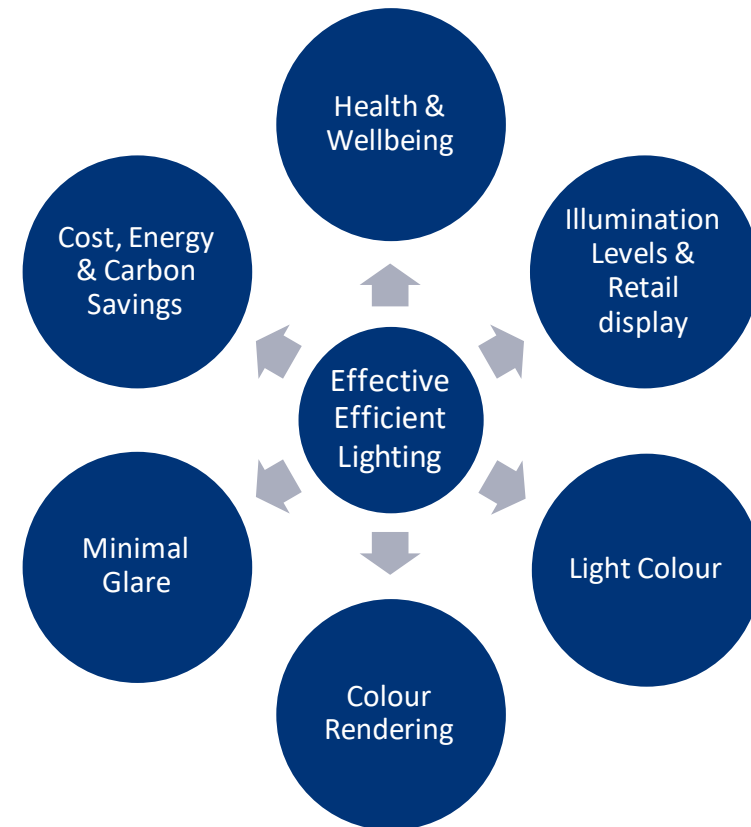


Night, unoccupied - lighting OFF

Figure 2 Use of an occupancy sensor with a photocell override to give the option of keeping lights off on bright days

Energy Efficient Lighting Technology

- Lighting uses around 20% of the electricity generated in the UK. With the majority of current lighting systems still reliant on inefficient light sources there remains significant potential to move to low energy lighting such as LED.
- Good colour rendering is essential, particularly in fashion retail where the visual appearance of the goods is critical.
- This applies equally to food retailing with the need for produce to look appealing.
- Modern LEDs can address this and thoughtful specification of colour temperature and colour rendering will provide a suitable retail environment.
- The high efficacy ratings of LED fittings can contribute towards significant efficiency and financial savings across the retail sector.
- It is possible to retrofit most luminaires with LED technology without altering the fitting. Whilst retrofitting lamps allows fittings to be upgraded as they fail, and offers a significant energy saving, it is less effective overall than full luminaire replacement which should ensure that the fitting uses the correct wiring and control gear, and help ensure that the correct amount of lighting is provided for the space.



Making the switch to LEDs

Install low energy lighting

Lighting must be selected to provide the required brightness and colour levels for given tasks. Sales areas are generally lit to high levels whereas other sections can be lower but still meet business and health and safety requirements.

Light Emitting Diodes (LEDs) were developed for use in electronics over 60 years ago, and in the last ten years have become the light source of choice, providing illumination at a fraction of the cost of legacy sources. LEDs have the highest efficacy and lamp life of all widely used lighting types, are easy to control and have no warm up period.

The cost of LEDs has come down significantly in recent years. In parallel, technological developments have improved light output, efficacy and reliability. These factors have made LED technology the mainstream solution for the vast majority of lighting applications in the UK. On the next page you can see the relative performance of LED fittings in comparison to existing light sources.

Refurbishment

Design for adequate, but not excessive levels of light. Specific display items that require high light levels will benefit from local task lighting, rather than illuminating the whole store to a high level.

Always consult a qualified lighting technician before upgrading lighting systems.

For further advice download the following carbon trust [lighting guide](#).

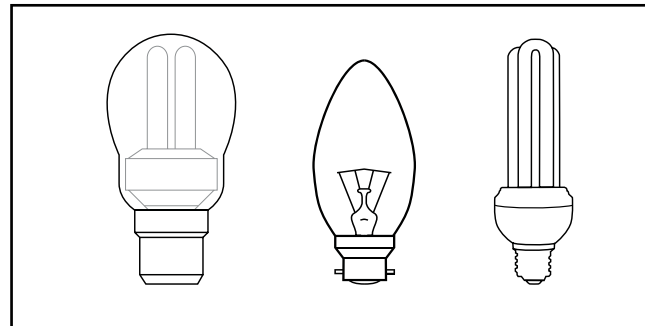


Figure 3 LEDs - a form of low energy lighting

Did you know?

- A new generation of LED lighting exists which will soon be viable for commercial use as a lamp technology: organic light emitting diodes (OLEDs). OLED lighting is composed of thin organic layers sandwiched between two electrodes and will be able to provide incredibly thin and flexible lighting solutions.
- As well as providing direct energy savings, LEDs can provide further cost savings due to:
 - Longer lamp life: this equates to lower and less frequent maintenance costs.
 - Reduced heat gain: LEDs produce very little waste heat compared to conventional sources, reducing the need for additional cooling on warm days.
 - Better controllability: through dimming and instantaneous switch on and off.

The relative performance of LED fittings in comparison to existing lighting sources

	Lamp Life	Colour Temperature	Colour Rendering	Efficacy*
Standard Incandescent	2,000 - 3,000 Hours	2,500 – 3,000K	100 Ra	5-20 lm/W
Tungsten Halogen	2,000 Hours	3,200K	100 Ra	15-24 lm/W
Tubular Fluorescent	10,000 – 12,000 Hours	2,700 - 6,500K	>85 Ra	60-105 lm/W
Compact Fluorescent	6,000 – 15,000 Hours	2,700 - 4000K	> 85Ra	45 -80 lm / W
High pressure sodium	12,000 -30,000 Hours	2,000 – 2,700K	25-85Ra	25-85 lm/W
Metal Halide	6,000 -20,000 Hours	3,000-6,000K	65-93Ra	50-113 lm/W
LED	25,000 -75,000+	2,700 – 8,000K	65-97 Ra	70-150+lm/W

*Refer to The Carbon Trust [lighting guide](#) for more information regarding LED criteria

Benefits of upgrading to LED: Retail Case Study

Case Study: Collister & Glover

Carbon Trust supported this company by providing:

- The impartial design and specification of a low energy lighting project
- The development of Invitation to Tender documents
- A shortlist of lighting suppliers from the Green Business Directory
- An independent review of resulting proposals

‘Excellent advice and an experienced guiding hand helped us through the process of assessing the technicality of LED lighting systems and the various options, allowing us to make a decision to proceed with confidence’

John R Collister, MD, Collister & Glover

- Stocklists & Distributors of Tubes, Valves, Fittings & Pumps
- Project: LED Lighting
- Total Project Cost: £17,317
- Capital Contribution Awarded: £2,598
- Energy Savings: ~60%
- The project should ‘payback’ in 4.8 years
- Project is being delivered by a Carbon Trust Accredited Supplier
- Due to be commissioned in January 2018

Key Opportunities for Energy Saving

Heating, Ventilation and Air Conditioning

It is possible to provide customers with comfortable temperatures and fresh air whilst keeping energy costs down.

Although heating, ventilation and air conditioning (HVAC) can all be separate systems, it is worth considering them together because they interact with each other when providing a conditioned environment for the building. By looking at how each element of an HVAC system complements the other, it should be possible to fine-tune the system to save energy and money.

Heating

The Building Energy Efficiency Survey (BEES) indicates that across non-domestic buildings in 2016, 67% of energy consumption was used on building services such as heating, ventilation and lighting.

Most retailers recognise the importance of keeping customers and staff comfortable, but many do not realise that 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.

Low-cost quick wins

Consider outside temperatures

Customers will be wearing warmer clothing if it is cold outside, so in-store temperatures should be set so they do not become uncomfortably hot while in-store. Some retailers waste energy by heating the area to accommodate staff wearing short sleeved uniforms. Always provide practical staff uniforms so appropriate, comfortable temperatures can be maintained. Reducing heating temperatures by just 1°C can cut fuel consumption by 8%. Listen to staff, especially after making changes and act on any feedback.

Open all hours?

Check system operating hours match the times when heating, ventilation and cooling are required, as needs vary throughout the day. It is often possible to reduce or shut down heating or air conditioning an hour before store closing without any noticeable difference to staff or customers. Use simple time switches in smaller stores to help to automate this process so that nobody forgets – and ensure time settings are reviewed 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.

Case study

What are other retailers doing?

A small retailer installed a simple extension timer because staff frequently worked outside the core daily business hours replenishing stock. This enabled heating times to be extended by a pre-set period whenever required, and avoided the need to reset the main time controls. As a result, staff comfort levels were increased during late night working while the retailer saved hundreds of pounds and a great deal of effort.

Open door policy?

Shoppers and suppliers require easy store access but 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. If you have an open door policy, try to keep external doors open only at busy times or try one of the following:

- Install automatic or revolving doors to help maintain the inside temperature while ensuring that shoppers and delivery personnel have easy access.
- Install a draught lobby to reduce the amount of hot or cool air lost through open doors. Air curtains powered by heat pumps also offer an efficient alternative. See [the Energy Technology List](#) for a range of available technologies.

Controlling systems

Some 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 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 and customer comfort.

For more information, [see the Heating Control technology guide](#), available from the Carbon Trust.

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 5% on annual heating costs.

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

Invest to save

Consider weather compensation and optimum start controls

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 building 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.

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. More information can be found in the Heating Control Technology guide.

Figure 4 A simple thermostat set at 19°C



Ventilation and air conditioning

Ventilation and air conditioning in retail are becoming commonplace due to heat-gains from lighting, staff, customers and equipment. The more heat that is generated, the harder the air conditioning system has to work to maintain the desired temperature.

It takes energy to heat and cool the air inside a building. If that air is mechanically removed then 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 again needs to be heated or cooled to match inside temperatures – and that also costs money.

Low-cost quick wins

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 in-store,

allowing mechanical ventilation to be switched off or turned down to save money. When opening vents, doors and windows, always consider security implications.

Maintain system components to ensure efficiency

Regular cleaning of ventilation systems can increase efficiency by as much as 25% compared with un-maintained systems. Dirty or faulty fans, air ducts and components (eg filters) 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.

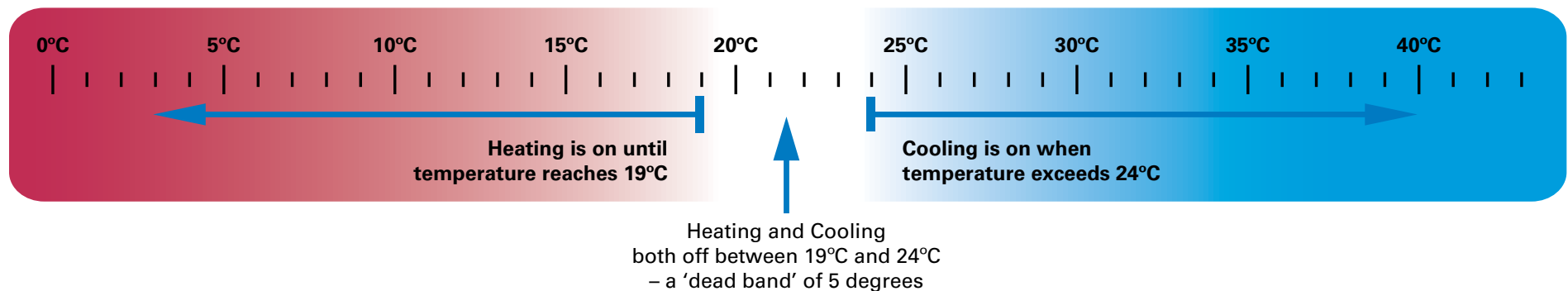
Stay cool at night

In some cases, ventilation fans can be run overnight to cool a shopping centre or large store, thus delaying the switching on of air conditioning. This is known as 'night cooling'.

Don't let heating and cooling operate at the same time

This can be avoided by setting a temperature 'dead band' – a wide gap between the temperatures at which heating and cooling cut in. In a retail environment, the heating should switch off when a temperature of 19-20°C has been reached and cooling should not operate until the temperature exceeds 24°C.

Figure 5 Diagram of 'dead band' control providing recommended temperatures



Invest to save

Minimise the cooling load – reduce overheating from sunlight, equipment, lighting and refrigeration.

Lighting and refrigeration generate large amounts of heat in-store. Generally, the more energy efficient these are, the less heat they produce, so install low energy lighting and keep refrigeration operating at peak efficiency to reduce cooling costs. Direct sunshine through large windows can also lead to overheating. Consider replacing window panes with special heat reflective glass or partition off the window display area to prevent heat build-up in-store. Awnings can be useful for shading main windows.

For further advice download the following publications:

[Heating, ventilation and air conditioning guide \(HVAC\)](#)
[Heating controls guide](#)

Switch off space-heating boilers in summer and chillers in winter, if possible. Then you will know you are in control.

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.

Green Business Fund

Investing in energy efficient equipment makes sound business and environmental sense, especially with the help of the Green Business Fund, which provides a combination of advice, training and direct capital contribution for energy saving equipment. To find out more visit: <http://www.carbontrust.com/greenbusinessfund>

Case study

What are other retailers doing?

- A carpet retailer from northern England sought to improve their energy efficiency through upgrading and installing new HVAC systems across the business. The new HVAC installations will allow for more efficient controls to be implemented, in the knowledge that previous systems were outdated and often left running. With the help of the Carbon Trust, the new systems are expected to achieve annual savings of £7K, with a payback period of 3-4 years.
- A large shopping centre maximises natural ventilation by drawing in fresh air through its atrium rooflights. Sensors have been installed to automatically close the rooflights when it rains. Using natural ventilation has lowered energy costs and proved to be a success with both management and customers.

Key Opportunities for Energy Saving

Refrigeration

Food retailers do not always realise how much energy is used by refrigerators and freezers, or that there are big savings to be made.

Since the energy used by refrigeration in a small retail outlet can account for half of the total electricity bill, it pays to look carefully at ways to improve equipment efficiency. Furthermore, refrigerators and freezers also produce heat which adds to the cost of maintaining comfortable temperatures. The hotter the environment, the more work refrigeration equipment has to do to keep products cool – so effective management can reap significant benefits.

Did you know?

Aerofoil technology can be fitted to the front of refrigerated display cases to help to minimize the escape of chilled air, and reduce energy losses. The technology is currently listed on the Energy Technology List: <https://www.carbontrust.com/etl>

Low-cost, quick wins

Operating at peak efficiency

The way equipment is operated has a big effect on the costs of running it:

- Avoid over-filling shelves. Apart from the danger of spillage, over-filling may mean that set temperatures have to be lowered in order to maintain safe product conditions.
- Ensure that insulating covers and blinds are used as intended. Leaving them off can increase energy use for both refrigeration and store heating.
- Ensure that lighting in cabinets is installed with energy efficient LED fittings and is switched off outside trading hours.
- Ensure that staff keep chiller doors shut. It may be helpful to put up energy awareness reminders.

Regular maintenance for optimum performance

Refrigerators that are not properly maintained will gradually use more energy and increase the risk of breakdown. Establishing a simple in-store maintenance schedule will save on energy and costs.

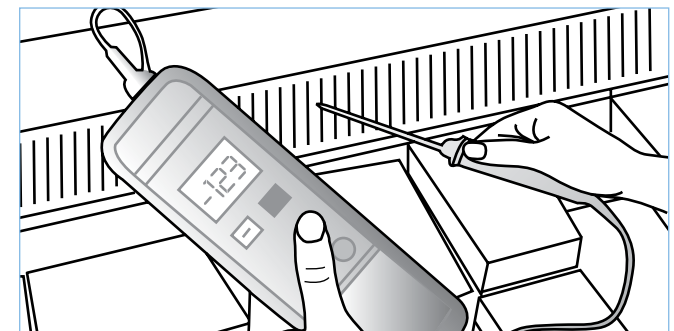
- Ensure that defrost procedures are followed correctly and regularly.

- Check door seals on cold rooms, fridges and frozen food stores.
- Keep condensers (often black fins at the back – where the heat is dissipated) clean and free of dust. The condenser can be a separate unit outside the store.
- Check systems have the correct amount of refrigerant.

Maintain correct temperatures and avoid over-cooling

Keeping refrigerated produce at the correct temperature is better for food and for cost savings. Energy consumption can be reduced by 2-4% if the set cooling temperature can be safely increased by 1°C. Ensure that the manufacturer's recommended operating temperature is set accordingly – and product temperatures are checked regularly.

Figure 6 A thermometer detecting appropriate temperatures in a freezer



Store drinks and other non-perishable chilled goods in a cool place

Avoid direct sunlight and heat emitting equipment to ensure stored products are as cool as possible before being put into cabinets. This means that the product will take less time to reach the desired temperature which will also reduce cooling equipment load.

Invest to save

Install night blinds to stabilise the temperature of chiller cabinets overnight

Night blinds help maintain the quality of chilled and frozen food and reduce heating costs by preventing cold air spilling from cabinets into the store. This produces a more consistent air temperature for when the store opens each morning, therefore requiring less space-heating. Installing night blinds to existing chiller cabinets is slightly more expensive than buying them integrated from new, but will pay back in energy savings fairly quickly and keep making savings year on year.

Consider time switches for cabinets containing drinks and non-perishable food stuffs.

Switching off appliances can save energy without a detrimental effect to the products. If you have differing time requirements throughout the week, a seven-day time switch can be used to ensure units are switched off over weekends. Contrary to belief, it is not cheaper to keep them switched on.

Upgrading equipment?

The decision to buy new refrigeration equipment will be based on business needs as well as price. It is always important to choose carefully because some units have much greater running costs which end up costing more over their lifetime, despite a lower purchase price. A full list of efficient refrigeration equipment, including refrigeration display cabinets and professional storage cabinets can be found on the [Energy Technology List](#).

The Carbon Trust has further information on buying the right equipment, ensuring correct installation, efficient operating practices and effective maintenance. Get in touch with the Carbon Trust's Green Business fund team to see if your business is eligible for support in identify and purchase new efficient equipment.

For further advice download the following publication:

[Refrigeration technology guide \[CTG046\]](#).

Tax incentives

Enhanced Capital Allowances (ECAs) are a straightforward way for a business to improve its cash flow through accelerated tax relief. The ECA scheme for energy-saving technologies encourages businesses to invest in energy saving plant or machinery specified on the Energy Technology List (ETL). Included on the ETL are a range of Refrigeration Display Cabinets and Professional Refrigerated Storage Cabinets. It is important to consider the cost savings associated with purchasing energy efficient refrigeration equipment, which overall will have lower running costs.

The ECA scheme provides businesses with 100% first year tax relief on their qualifying capital expenditure. The ETL specifies the energy-saving technologies that are included in the ECA scheme. For further information please visit <https://www.gov.uk/guidance/energy-technology-list> or call the Carbon Trust on 0300 3300657

Case study

What are other retailers doing?

A large food retailer installed night blinds to all of their refrigerated display cabinets. The costs associated with this were paid back over three years and led to significant savings for the company. The initial cost of installation would have been halved if they had been installed at the outset, so now the company specifies night blinds and strip curtains whenever they purchase refrigeration equipment.

Key Opportunities for Energy Saving

Building Fabric

Building fabric

Typically, two thirds of heat in-store 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 a store's building fabric makes good sense for many reasons:

- Better temperature control – it can prevent overheating and lower ventilation and air conditioning costs.
- Improved productivity – staff morale and output can be enhanced by providing a more comfortable working environment through reducing draughts, solar glare, overheating and noise.

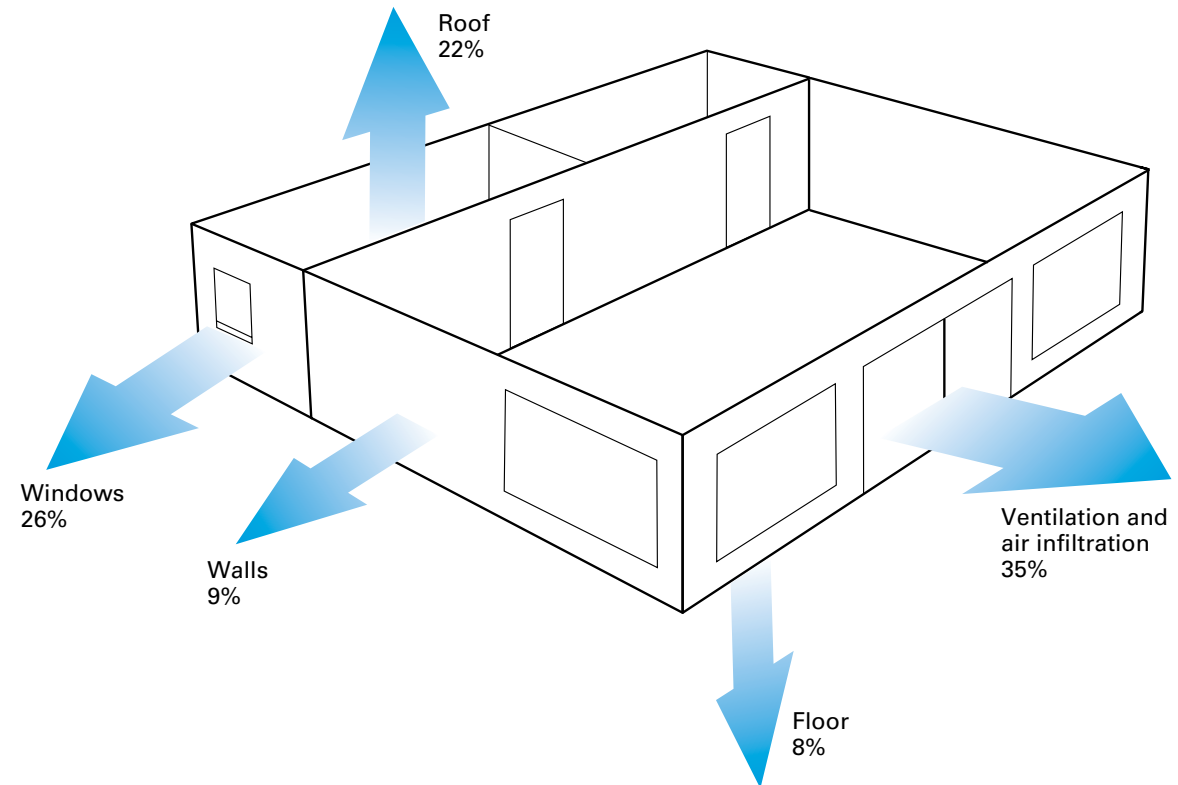


Figure 7 Heat loss from typical building

- Lower running costs – Reheating the space to offset heat losses can be an expensive waste of energy.
- Lower capital expenditure – a more efficient, wellinsulated store needs smaller heating and cooling plant.
- Good investment – better insulation can increase a store's value and attractiveness.

Opportunities for energy saving

Undertake regular maintenance and avoid expensive problems later on

In well maintained buildings potential problems are identified and dealt with promptly. In particular, gaps or holes in walls, windows, doors and skylights should be repaired immediately. This provides instant savings and also improves store appearance.

Establish a housekeeping schedule and involve staff

Compile a regular checklist to address areas where energy is lost via the building structure. The larger a building, the more beneficial it would be to appoint staff to carry this out. A comprehensive schedule should include checking window panes, frames and roof lights.

Regularly check the building for damp

Damp causes significant damage to the building structure and reduces its insulating properties. Repair split downpipes, faulty gutters, leaky roof tiles, and any leaking internal or external plumbing. Check for signs of damp and condensation at least once a year, preferably prior to the winter months.

Reduce heat loss via delivery doors and docking bays

There are a number of ways to prevent warm air escaping from storage areas and delivery doors, including the application of:

- Air-locks / lobby areas.
- PVC curtains.
- Warm air curtains.
- High speed motorised doors with automatic opening and shutting controls.

Insulate to accumulate

25% of a building's heat will escape via an un-insulated roof which adds hundreds or thousands of pounds per year to heating bills. In particular, single skin roofs that can often be found in retail warehouses (such as those made of asbestos or corrugated iron) can lose a lot of heat. These should either be appropriately lined or over/under sprayed with insulation.

For more information on building fabric improvements, please take a look at [the building fabric guide for SMEs.](#)

Key Opportunities for Energy Saving

Energy Management

It is important to ensure the management team are aware of the benefits that energy efficiency can bring to a store in order to get all of the workforce involved and committed to an energy management programme.

Good practice

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

- Cost savings.
- Healthier and more productive working conditions.
- An enhanced corporate image which can be promoted to customers.

All of this means an improved competitive advantage for your business.

Opportunities for energy saving

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 store.

Involve staff

All staff are important in saving energy so they must be made aware of those business areas that are wasteful, 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. The best ideas usually come from the shop floor. 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.

Common barriers that lead to energy efficiency not being taken seriously in your store include misconceptions such as:

- 'Our efforts will make no difference to me'.
- 'There are more important issues to address'.
- 'It is high risk'.
- 'I only want to sell my goods. Technical stuff is too complicated for me.'

- 'Leaving lighting and equipment on is more efficient than turning it off and on again'

Reduce these common barriers by involving decision-makers and staff alike. Every staff member has an impact on energy use and they should be made aware of this.

Case study

What are other retailers doing?

A leading Welsh SME has begun to introduce an energy policy across the business, which will set employees achievable environmental targets. Management initiatives of this nature will help to improve the energy efficiency of the business, contributing towards an annual reduction in energy bills of over £8,000.

A large retail store installed a building management system (BMS) which reduced energy costs by more than 10%. A BMS is a network of heating and ventilation controllers that are interfaced with a computer. It offers closer control and monitoring of building services performance (including air conditioning) and allows settings to be changed quickly and easily. This can be monitored via computer screen in real time.

Set targets

Make it clear to staff where energy savings can be made, and the benefits to the company of making those savings e.g. freeing up additional resources that can be spent elsewhere. As the energy saving programme gathers momentum, it will be possible to track progress and highlight energy savings. Set targets – most businesses in the UK could reduce their energy consumption by 10-40%. However, it is important to be realistic: many companies start with 5% per year.

Undertake regular company-wide checks

Carry out regular checks around the store to ensure good practice is evident. 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.

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 organisation does not

have half-hourly or Smart electricity meters, you should check and record monthly meter readings yourself. Undertaking such measures will allow for areas of bad energy practice to be identified, which will help contribute towards effective target setting for reducing energy consumption in the workplace.

You can contact your energy supplier to request the installation of a Smart energy meter. Smart meters will help you to track and understand your energy consumption and you will no longer receive estimated bills, as the meter communicates your consumption directly to the supplier. Electricity and gas suppliers need to demonstrate that they have done all they can to roll out smart meters to all their domestic and small business customers by the end of 2020.

For further advice download the following publications:

[Introduction to energy management \(CTV045\).](#)

[Energy management guide \(CTG054\)](#)

Action checklist

✓	Action	Savings
☐	Switch off all non-essential lighting out of business hours. Install timers to help with this (Page 6)	10% of lighting costs
☐	Install photocell controls to switch off some lighting on brighter days (Page 7)	20% of lighting costs
☐	Replace traditional lighting with LEDs to reduce operating and maintenance costs (Page 9)	75% of tungsten lighting costs
☐	Experiment with switch-on times for heating and air conditioning and switch off well before closing (Page 12)	20% of heating and cooling costs
☐	Ensure thermostats are set correctly – increase temperature set-point for cooling and reduce set-point for heating (Page 12)	A 1°C reduction in temperature during the heating season can cut costs by 8%
☐	Install time controls so that equipment (such as escalators and vending machines) and HVAC systems only run during business hours (Page 15)	15% of escalator power costs
☐	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 14)	10% of heating costs
☐	Turn off unnecessary equipment during the day and especially out of hours to reduce heat build-up (Page 15)	5% of energy costs
☐	Check insulation levels and increase wherever practical to reduce heating requirements (Page 19)	5% of energy costs
☐	Walk around your site 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 16)	5% of heating costs

Myths and assumptions

ASSUMPTION – “Switching off an extractor fan will not have much of an effect on our cost savings”.

FALSE! – A single fan may only signify a small power load yet could bring about a significant loss of heat from a store if not adequately controlled. The heating system would have to compensate which could typically increase boiler fuel consumption by around 5%.

MYTH – Leaving air conditioning on overnight reduces energy

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

REMEDY – A store 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.

MYTH – Retail lighting needs to be as bright as possible

FALSE! – Low energy lighting and automatic controls can reduce electricity bills without detracting from displays. Spotlights and other appropriate techniques can add atmosphere to a store. Do not assume that brightly lit shops are better frequented – consider the whole shopping experience.

ASSUMPTION — Our boilers have to be on all year round.

FALSE! – If you have several boilers, it is likely there is a smaller one designed to supply your hot water needs only. Switching off the other boilers, particularly during summer months, can save energy.

MYTH – Turning air conditioning thermostats as low as they can go cools a store more quickly.

FALSE! – The result is that the temperature drops at the same rate but then overshoots and reaches the heating system switch-on temperature. Both systems may then operate at the same time.

REMEDY – Set thermostats correctly and protect them to prevent tampering, where possible.

MYTH—It is better to leave fluorescent lighting 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.

Next steps

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

Step 1 Understand your energy use

Look at your store 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 your opportunities

Compile an energy checklist. Walk round your building and complete the checklist at different times of day (including after hours) to identify where energy savings can be made. An example checklist is on [page 22](#).

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.

Go online for more information

The Carbon Trust provides a range of tools, services and information to help you implement energy and carbon saving measures, no matter what your level of experience.

Website – Visit us at www.carbontrust.com for our full range of advice and services.

➤ www.carbontrust.com

Tools, guides and reports – We have a library of publications detailing energy saving techniques for a range of sectors and technologies.

➤ www.carbontrust.com/resources

Events and workshops – We offer a variety of events, workshops and webinars ranging from a high level introductions to our services through, to technical energy efficiency training.

➤ www.carbontrust.com/events

Small Business Support – We have collated all of our small business support in one place on our website.

➤ www.carbontrust.com/small-to-medium-enterprises/

Our client case studies – Our case studies show that it's often easier and less expensive than you might think to bring about real change.

➤ www.carbontrust.com/our-clients

The Carbon Trust Green Business Fund – is an energy efficiency support service for small and medium-sized companies in England, Wales and Scotland. It provides direct funded support through energy assessments, training workshops, and equipment procurement support. *

➤ www.carbontrust.com/greenbusinessfund

SME Network – Join a community of over 2000 small and medium-sized businesses to discuss your strategy and challenges to reducing carbon emissions and improving resource efficiency. Sign up for free to share knowledge, exchange useful resources and find out about the support and funding available in your area, including the details of your local energy efficiency workshops.

➤ www.carbontrust.com/resources/tools/sme-carbon-network

The Carbon Trust is an independent company with a mission to accelerate the move to a sustainable, low-carbon economy. The Carbon Trust:

- advises businesses, governments and the public sector on opportunities in a sustainable, low-carbon world;
- measures and certifies the environmental footprint of organisations, products and services;
- helps develop and deploy low-carbon technologies and solutions, from energy efficiency to renewable power

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