Working together for
a world without waste

Business Resource Efficiency Guide

Finding Cost Savings: Resource Efficiency for SMEs

Working together for
a world without waste

Our vision is a world without waste, where resources are used sustainably.

We work with businesses and individuals to help them reap the benefits of reducing waste, develop sustainable products and use resources in an efficient way.

Find out more from the WRAP Resource Efficiency Helpline on 0808 100 2040 or at www.wrap.org.uk

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Summary

This guide aims to help small to medium-sized enterprises/organisations (SMEs) and the business support organisations advising them to find concise, useful reference information on resource efficiency, environmental legislation and management tools. It also has an overview of the activities that small businesses may be involved in.

At face value, using your raw materials wisely just seems like common sense. It is – but with support and increased knowledge, you could adopt an approach to safeguard these resources that may well save you money and enable you to invest in growing your business.

All organisations should aim to be as resource efficient as possible by preventing waste from the outset. Organisations across the UK have the potential to save up to £23 billion a year by using resources such as water, energy and raw materials more efficiently. In many cases, much of this money could be saved quickly and simply.

This guide will help to pinpoint what resource efficiency is about and the steps you can take to save money.

1 Introduction

All organisations should aim to be as resource efficient as possible by preventing waste from the outset.

This guide aims to help small to medium-sized enterprises/organisations (SMEs) and the business support organisations advising them. The guide is designed to act as a compass to guide you to concise, useful reference information on four topics.

- **Resource efficiency.**
- **Environmental legislation.**
- **Management tools.**
- **Business sectors.**

Use the tabs at the bottom of every page to help you find information in each of the four topics. The flow diagram in Section 1.3 will help you to navigate through the topics in a particular order of benefit to your organisation.

This is not an exhaustive list of the topics you will need to cover in managing your organisation, but it should help you to get your bearings on the road to greater efficiency and profit.

As a person working in a small organisation, you probably find that nearly all of your time is dedicated to core activities and everything else can seem like an unnecessary distraction. However, there are aspects that may not appear to be vital to your organisation, but are, nevertheless, key to your success. If they are ignored, your whole organisation may be at risk. The good news is that if you are aware of them you can use them to your advantage and, in many instances, make cost savings at the same time.

1.1 Why these four topics are important

1.1.1 Resource efficiency

At face value, using your raw materials wisely just seems like common sense. It is – but with support and increased knowledge, you could adopt an approach to safeguard these resources that may well save you money and enable you to invest in growing your business. The amount of raw material that goes into the process and is not used in the final product is waste. Waste can be dealt with in a number of ways, but the most effective is by following the waste hierarchy, which ranks waste management options in terms of sustainability.

All organisations should aim to be as resource efficient as possible by preventing waste from the outset. However, if this is not possible, then consider reusing, recycling or recovering other value (e.g. energy). Not all wastes can be dealt with in these ways, so you will need to dispose of them in a responsible manner. Organisations across the UK have the potential to save up to £23 billion by using resources such as water, energy and raw materials more efficiently[1]. In many cases, much of this money could be saved quickly and simply.

This guide will help to pinpoint what resource efficiency is about and the steps to take to save money. The purpose is to encourage you to consider the contribution that resource efficiency can make to your organisation's bottom line. There are a number of good reasons for getting involved in resource efficiency.

- **Waste and poor resource efficiency cost money** – many organisations underestimate how much waste is costing; it could be as high as 4% of turnover.
- **The true cost is often hidden** – the true cost of waste isn't limited to the charges for disposal. It also includes wasted raw materials, energy and labour – which can be between 5 and 20 times more than the cost of disposal. It could cost more to throw resource away than to purchase it in the first place.
- **Your reputation** – customers, financial institutions, employees and suppliers have a growing interest in the environmental performance of organisations. The efforts you make to reduce waste indicate to them how effectively and efficiently you control your operations.

[1] The Further Benefits of Business Resource Efficiency published by Defra, March 2011.

1.1.2 Environmental legislation

There is a great deal of environmental legislation. It can be hard to know which areas apply to your organisation and what is the best way of ensuring that you comply. Regulations exist to protect the environment from damage that may be caused by organisations of all sizes. These regulations cover the waste you dispose of, the materials that you may pour down the drain, and the emissions, fumes and vapours from your processes.

This section provides signposts to legislation that may have an impact on your organisation's activities and provides a ten-step approach that will help to ensure you are complying. It also indicates a pragmatic way to get started.

1.1.3 Management tools

No organisation can afford to lose a good reputation. By complying with legislation and taking steps to reduce your organisation's impact on the environment, you can reassure your customers, the bank and investors that you are carrying out your business in an organised, efficient, sustainable and responsible manner.

This section explains the principles of sustainability and the ways you can demonstrate that your environmental responsibilities are being carried out appropriately.

You may believe that your organisation has no environmental impacts, but it uses energy in some form, and produces solid and liquid waste. Keeping your use of energy and the generation of waste low is not only good for the environment, but it can also benefit your organisation by creating savings, improving your competitive edge, and enhancing your image with customers and investors.

To demonstrate their commitment to the environment, many organisations publish an environmental policy. Included in this section is guidance on how you can draft, develop and use an environmental policy. Even small organisations can benefit from this as it provides a systematic approach to using and managing resources. With the increasing importance of good environmental practice, you will find that your major customers will begin quizzing you on your environmental performance and even awarding contracts to those organisations that demonstrate a robust environmental policy.

1.1.4 Business sectors

This section gives an overview of the activities that small businesses may be involved in. Sectors covered include retail, hotels, manufacturing and metal engineering, vehicle repair garages, catering and food production, and printers. Your organisation may not fall directly under any of the particular categories outlined. However, do not let this deter you from looking through the information as you will find issues that are still going to be relevant – particularly the section on offices. You will find information on good resource management; what waste reduction entails; water use and how to avoid wasting water; the use of packaging, heating and lighting; solvent recovery; and how to dispose of chemical waste.

1.2 How WRAP can help you

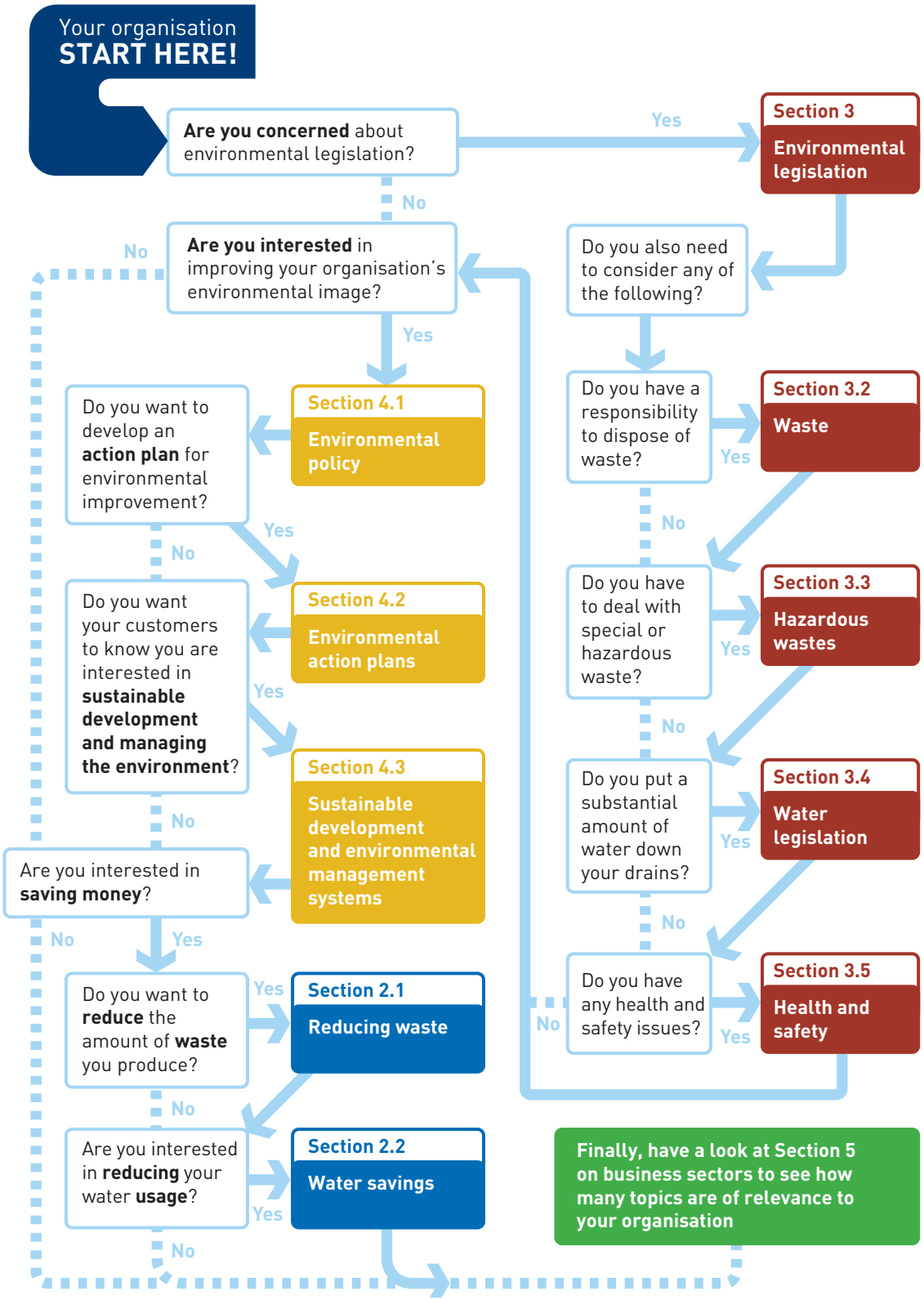
Once you have used this guide, you may have got your bearings, but still need help to improve your resource efficiency. This is where WRAP can help.

WRAP works to help businesses and individuals reap the benefits of reducing waste, develop sustainable products and use resources in an efficient way.

Section 6 provides links to useful guides and tools that can help your organisation.

1.3 Flow diagram navigation

You may find this flow diagram useful for pinpointing an order in which to look through the sections in this guide.



2 Resource efficiency

Organisations often think that their only waste is the contents of their bins or skips, but this is far from the case.

2.1 Reducing waste

2.1.1 What is waste?

There are literally hundreds of words for different types of waste. Don't think that your organisation doesn't produce waste simply because it uses another name for it. Whatever you call it, waste is waste. All organisations produce waste – even efficient ones.

Waste is not simply material that is excess to requirements – it represents the loss of valuable assets.

Organisations often think that their only waste is the contents of their bins or skips, but this is far from the case. Waste takes many forms, including:

- refuse (also known as solid waste, trade waste, etc);
- waste packaging;
- water (e.g. dripping taps and leaks);
- effluent;
- waste oils, solvents, liquid residues in drums;
- smoke and fumes;
- heat/energy losses;
- rejects and rework; and
- wasted effort.

Organisations that manage their waste effectively and identify practical ways to eliminate the waste they generate tend to be more efficient and effective.

The waste hierarchy (see Figure 1) identifies waste management options and ranks them in terms of sustainability. All organisations should aim to prevent waste from the outset wherever possible. However, if this is not possible, then consider reusing, recycling or recovering other value (e.g. energy). Not all wastes can be treated in these ways, so you will need to dispose of them in a responsible manner.

Waste disposal has the greatest impact on the environment and is typically the least cost-effective waste management solution. Therefore, it is best to aim to 'move up' the waste hierarchy so that you not only save money, but also reduce your use of raw materials, water and energy – as well as improving your environmental reputation.

Figure 1: The waste hierarchy

There are many benefits associated with preventing waste and improving resource efficiency – benefits that will appeal to any organisation, whatever its size.

What is the cost of waste to small organisations?

Many organisations underestimate how much waste costs them; it could be as high as 4% of turnover. The true cost of waste isn't limited to the charges for disposal. It also includes wasted raw materials, energy and labour – which can be between 5 and 20 times more than the cost of disposal. It could cost more to throw resource away than to purchase it in the first place.

There are many benefits associated with preventing waste and improving resource efficiency – benefits that will appeal to any organisation, whatever its size. These include:

- cost savings from reduced raw material and waste disposal costs – typically over 1% of turnover can be saved;
- improved process performance;
- improved environmental performance;
- compliance with legislation and reduced risk of environmental incidents; and
- commercial and strategic advantages – it can make your organisation more competitive and improve its standing with customers who seek assurance that their suppliers are operating on a sound environmental basis.

Specific benefits to employees include:

- improved working conditions;
- cost savings (typically £1,000 per employee), releasing money that can be spent on other things such as training, motivation and team working;
- 'feel-good factor' in the organisation; and
- improved recruitment and retention of staff.

Consider how much product you have to sell or service you have to deliver to make a profit of £1,000 – remember cutting out waste pays pure profit.

Bills are a useful source of information. Use them to:

- check that you are being charged for the right number of waste pick-ups; and
- check that all your rented skips and bins are still on site?

How can I make savings?

Spend a short time carrying out a systematic review of your organisation's waste production.

Waste takes precious time and resources to generate and so the key to cutting waste costs is to try to prevent it in the first place.

- Imagine that you are seeing your operations for the first time.
- Challenge the way you do things.
- Follow the waste hierarchy. Start with prevention. If that is not possible, try to reuse the waste. Recycling is the next best option. Alternatively, you could look at recovering other value from the waste (e.g. energy). Disposal should be the last resort.

Secondly, walk around your site looking for waste and asking the following questions.

Administration

- Can you monitor the paper use and waste from printers and photocopiers?
- How can you encourage people to 'think before you print'?
- Is the paper waste created because there are no clear instructions?
- Have employees been properly trained in using the IT equipment or are they learning as they go?
- Do you log your computer and copier problems, and look for common causes that can be addressed?

Stores

- How much damaged stock can you see – what can you do to prevent this in the future?
- Do you suffer from never having enough storage space? If so – why?
- Have you talked to your supplier about reusable or returnable packaging?
- How can you prevent stock becoming out of date?
- Why is there so much stock?
- Is there a 'first-in, first-out' system – and is it working?

- Are 'goods in', 'work in progress' and 'finished material' all jumbled together?
- How much time is spent looking for stock?

Production

- Is the production area used as a store?
- What is on the floor?
- Why is material in the waste bin?
- Where are the tools and equipment stored?
- Why are there off cuts and what happens to the leftovers?
- How much is left in containers, drums and bags?
- Are you and your employees aware of how much the expensive materials and consumables cost the organisation?
- How much is cleaning up costing you in water, detergent and solvents?
- You bought this much and you sold that much – where did the rest go?
- When did you last check your estimates against reality?

Measure and manage: always convert waste to a 12-month figure; wasting £1 a day doesn't seem much – wasting £365 does! You will find that as soon as you put a figure on things, you start asking the right questions to save money.

Packing and dispatch

- Are you sure your customer requires all the packaging you are using?
- Are you reusing your suppliers' packaging?
- Could you use shredded confidential waste papers as packaging?
- How many rolls of packaging tape are in the area?
- How much do you spend on packaging per year?

Outside your premises

- What is hiding in the skip or wheelie bin? Why not do a daily check over the next few days – you may be unpleasantly surprised?
- Are you paying to empty bins full of air?
- Do you really need the extra skips and bins? Waste creation grows to fill the space available! Number your wheelie bins and fill them in strict rotation.
- Are the contents of the bin compacted by hand? Flatten boxes, bags and plastic bottles.
- If you can find a licensed waste carrier to remove segregated waste, make sure you keep the waste clean to maximise its value.
- Your quantities of waste are probably too small to interest a recycler and you are not allowed to take trade waste to an amenity/recycling site. Therefore, contact your local council or green business organisation to find out about opportunities for locally based waste exchange or recycling collections.

A dripping tap will waste at least 5,500 litres of water per year. Dripping hot water means you are paying to heat the water before you throw it away!

2.2 Water savings

2.2.1 Water facts

- Water has business and environmental costs.
- The water to most commercial/industrial premises is metered – the more you use, the more you pay.
- Not only do you pay for the water when it comes in, you also pay the effluent and sewerage charge when you dispose of wastewater to the drain.
- Climate change – wetter winters when we don't need the water, drier summers when we do need it are making water abstraction a major environmental concern.
- Water distribution doesn't happen by gravity – it uses huge amounts of electrical energy to pump the water from the source to the tap.

2.2.2 What can you do?

Firstly, look at your water bills – is your supply metered?

1. Check the effluent and sewerage charge

For most organisations, this is based on 95% return to sewer. Does all of your water go down the drain? You may be eligible for a discount if it goes into the product or it evaporates – talk to your water company.

2. Check the 'standing charge'

This is based on the size of your meter and inlet pipe. Has the use of the premises changed (e.g. from a bottling plant to a dried fruit packer?). If you have an oversized water meter, ask your water company to change it to a smaller one.

3. Check the bill for the amount of water used

Are there any unexplained differences that might give you a clue about possible waste or leaks? Invisible leaks under the floor or the yard can cost you thousands of pounds. Remember, any leak occurring after the metering point is charged to you.

4. Read the meter before and after the weekend or holiday shutdown

After you have read the meter, do you need to ask questions about who or what was using water outside of working hours? For example, unauthorised use of your outside tap to wash cars, caravans or boats.

Before you file your bills, it may be useful to insert a simple chart of water use that you can update each time you get a bill so that you can monitor any changes.

Next, spend some time walking around your site looking for where water is being wasted.

1. Check dripping taps and water flow

Fix dripping taps. A dripping tap will waste at least 5,500 litres of water per year. Dripping hot water means you are paying to heat the water before you throw it away!

Is your water pressure too high? If you have high water pressure you may need to consider fitting some form of flow regulation. Tap aerators and flow restrictors are low-cost solutions and can reduce water use by up to 70%. A flow rate of between 5 and 6 litres/minute is usually adequate for hand washing.

2. Check the toilets

Typically, toilet cisterns account for over 40% of water consumption in the workplace. Where suitable, fit older 9-litre WC cisterns with volume adjusters, which will reduce the amount of water per flush by up to 2 litres. Also, consider the flushing of urinals. Continual flushing can cost hundreds of pounds. Automatic controls, such as passive infrared (PIR) sensors, can save up to 75% in water use and costs.

3. Check the temperature of your hot water

Does it need to be as hot as it is?[2] Reducing the water temperature, even by 1°C, will lower your energy costs. Next time you wash your hands think about how much hot water you could be wasting.

[2] Legionella is generally controlled by storing hot water at temperatures above 60°C and distributing it at 50°C.

If your washroom sinks are located some distance from the hot water supply, consider installing point-of-use heaters. It costs money to fill long runs of pipes with hot water and there is a risk of Legionella bacteria contamination if water between 20°C and 45°C becomes stagnant and the system is not cleaned.

4. Look at any hoses being used

When did you last think about your washing operations from the point of view of ensuring the minimum water use – and what wasteful methods are being used? Fitting trigger action spray guns to hoses can make dramatic savings.

5. Check your washing processes

These are notorious for washing money down the drain.

Try to agree a standard, efficient, washing method and then enforce it. Organisations that use a lot of water may also consider grey (recycled) water systems or rainwater collection. Both require some investment, but will save money in the long run.

If your organisation uses dishwashers or clothes washing machines, ensure they are used efficiently. When buying new appliances choose those with the highest energy and water rating to ensure maximum efficiency.

Are you washing any materials down the drain? If so, you must have trade effluent consent from your water company (foul drain) or an environmental permit from the Environment Agency (surface water drain). The 'dirtier' the water, the higher the costs – consider dry-clean methods, such as floor scrapers.

6. Check your visible pipes for leaks

Not only can leaks cost money in lost water, they can also cause damp problems.

3 Environmental legislation

Legislation facts

- The European Commission produces around 50 items of new environmental legislation each year and most of these are then made into UK legislation.
- UK legislation is produced as Acts (which usually give the broad principles) and subsequent Statutory Instruments (which give more specific details).
- Devolved government in Northern Ireland, Scotland and Wales then allows for regional variations.
- Each piece of legislation appoints regulators to be responsible for compliance (e.g. the appropriate local government authorities, the Environment Agency, water companies, police) and they regulate the application of the law.
- However, the final interpretation of the meaning of the law is often only decided when the regulator takes someone to court and the decision then sets a benchmark for future cases.

Realistically, the only way for small organisations to cope with this volume of legislation is to accept that they cannot possibly become experts on environmental legislation, but should be experts on their own organisation and use that knowledge to identify potential problems.

You are probably already complying – find out using the ten steps below

For brevity, this section refers to the primary legislation for England and Wales. Alternative measures may apply in Scotland and in Northern Ireland. If you are in any doubt, contact your local regulator:

- **England and Wales:**
  telephone 03708 506 506 or visit
  www.environment-agency.gov.uk
- **Scotland:**
  telephone 01786 457700 or visit
  www.sepa.org.uk
- **Northern Ireland:**
  telephone 028 9056 9371 or visit
  www.doeni.gov.uk

3.1 Ten steps to peace of mind about environmental legislation

Step 1

Make a list of all the hazardous materials that you purchase, use or sell.

Each hazardous material should be provided with a **safety data sheet** – make sure you have a safety data sheet for each hazardous material you purchase, use or sell and file them alphabetically for ease of access. Using these, you can establish possible concerns about use, disposal and spillage. If you have further concerns after reading the safety data sheet, contact your supplier. You should ensure you have this information to help you comply with health and safety requirements.

(Relevant legislation: Control of Substances Hazardous to Health (COSHH) Regulations)

Step 2

Check what is entering your foul drain.

The foul drain takes dirty water from the toilets and sinks. You must not put any other materials down the drain – particularly hazardous or polluting materials that could cause problems at the sewerage treatment works – unless you have a **trade effluent licence** from your water supplier.

Think about the items on your hazardous materials list and then about things like oils, cooking fat, cutting fluids, medicines, chemicals, food processing waste, cooked food waste and washwater from cleaning vehicles, floors or machines.

Usually, the effluent from small organisations does not concern water companies, but contact them to make sure.

(Relevant legislation: Water Industry Acts 1991 and 1999)

Step 3

Do you dispose of anything to the surface drains?

Surface drains are for clean rainwater, and run into streams and rivers. The rule is almost the same as for the foul drain except that you must not allow anything else to enter surface drains unless you have a consent from your local regulator. Again, small organisations are often exempt – but you need to make sure.

(Relevant legislation: Water Resources Act 1991)

Step 4

What about spillages?

If you identified any materials that should not go down the drain, is there any chance that you could have a spillage of these materials that might enter the drains? Consider delivery, storage, use and waste material awaiting collection. In particular, think about vandals who could cause a pollution incident – you may be held responsible for this, have a fine imposed on you and have to pay for the clean-up costs.

Consider 'bunding' to contain any possible spillage. This is a drip tray/walled area, which will contain any spills. Bunding is compulsory where more than 200 litres of oil are stored.

Contact your local regulator for further information on pollution control.

(Relevant legislation: Control of Pollution (Oil Storage) Regulations 2001)

Step 5

Does your organisation generate waste?

If it does, then you have a **'duty of care'** to ensure that you do not allow the waste to escape and that you dispose of your waste legally using a responsible waste disposal company that is licensed to carry your particular waste.

Don't forget it is your waste and, therefore, your duty of care. If your waste disposal company 'fly tips' your waste, **you** can be prosecuted for not carrying out **your** duty-of-care responsibilities adequately. You must have a record of the waste type and quantity, and to whom you passed the waste – this is known as a **waste transfer note**. Your waste disposal company normally provides these and you must keep them for at least **two years**. However, a waste disposal company may decide to reduce the paperwork and issue an annual waste transfer note.

(Relevant legislation: Waste (England and Wales) Regulations 2011)

Step 6

Does your organisation have 'hazardous waste'?

Refer to your list of hazardous materials – these must be disposed of as **hazardous waste** using the correct paperwork, which ensures that the Environment Agency is informed of the disposal. Check that your waste disposal company is doing this and that it is licensed to carry hazardous waste – don't forget it is **your** duty of care! You have to keep your copy of the paperwork for at least **three years**.

Hazardous waste is a complicated area – it includes acids, alkalis, solvent-based materials (e.g. paints and adhesives), oils, chemicals, pesticides, asbestos, and other toxic and flammable materials. If you think you may have a hazardous material, talk to your supplier, your waste disposal company or the Environment Agency.

(Relevant legislation: Waste (England and Wales) Regulations 2011 and the Waste (Miscellaneous Provisions) (Wales) Regulations 2011)

Step 7

Do you handle large quantities of packaging?

If you handle more than **50 tonnes/year** of packaging and you have an annual turnover of more than **£2 million**, then you have to comply with the **Producer Responsibility Obligations (Packaging Waste) Regulations 2007**.

These are too complicated to explain briefly here, but if you do meet the criteria above you can find out more by contacting your local regulator.

(Relevant legislation: Producer Responsibility Obligations (Packaging Waste) Regulations 2007)

Step 8

Do any of your organisation's processes pollute the air?

Operators of gasification, liquefaction and refining activities will normally require an environmental permit to carry out any activities described in Chapter 1.2 of schedule 1 of the Environmental Permitting (England and Wales) Regulations 2007. The permit may be issued from the Environment Agency or a local authority.

(Relevant legislation: Environmental Permitting (England and Wales) Regulations 2007)

Step 9

Is your organisation a nuisance?

If your organisation makes excessive noise, smell, dust or smoke, then your neighbours may complain to the local authority, which can put an abatement order on you. The difficulty is that people have a different threshold of tolerance (e.g. to one person the barely audible humming of a machine and a pleasant smell of fish and chips can be a sleep-shattering rumble and a stink of rotten fish to another person).

Make a list of your noise, smell, dust and smoke, and think how you can eliminate them before they become a problem.

(Relevant legislation: Environmental Protection Act 1990)

Step 10

Are there any more areas of concern?

Other areas of concern are all to do with unusual situations or materials such as asbestos, chlorinated solvents or ozone-depleting refrigerant gases (CFCs).

To find out if you use something unusual, start with the safety data sheet and then talk to your supplier. Your trade association or trade magazine should be able to provide you with the information you need to make a decision.

3.2 Waste legislation

3.2.1 How is waste defined?

This isn't as easy to answer as it might appear and your definition of waste may not be how it is defined in law. A definition of waste is: any substance or object the holder discards, intends to discard or is required to discard.

Is it waste even though I can sell it?

Yes, it is waste if it is of no use to you.

Even if it is going to be recycled and returned to me?

Yes, it is waste because it is of no use to you until it has been through the recycling operation.

Even though it is a by-product of my business, such as scrap-metal off cuts?

Yes, it is waste because before it can be put into the furnace it is sorted, cleaned, cut or otherwise worked on.

What about wood shavings that I bag up and sell as animal bedding?

Take care! The Environment Agency has to make decisions on a case-by-case basis – you would need to show that it is part of your 'normal commercial cycle' or that it is a raw material that does not require further work before use. If you have a concern, contact the Environment Agency.

So, what about my redundant computers that I am giving to my local school?

No, they are not waste because they are still being used for their original purpose.

Why is the definition of waste important?

All commercial and industrial waste comes under the 'duty of care' requirements of the Environmental Protection Act 1990.

What is 'duty of care'?

Anyone who makes, stores, transports, treats, recycles or disposes of waste has a 'duty of care' to 'take all reasonable steps' to keep and dispose of the waste safely.

What do you have to do when generating or storing waste?

Make sure the waste is secure and can't escape. Consider the potential effects of wind, rain, floods, vandals, fire, etc. It is your duty of care to consider the consequences and take steps to avoid them.

What do I have to do if someone collects my waste?

When you pass waste on to someone else, you must ensure that they are a registered waste carrier. A list of registered waste carriers can be obtained from your local regulator. Licences or exemptions are also obtained from your local regulator. You should ask to see the disposal company's waste carrier number and its licence conditions.

What about the local charity and voluntary organisation that collect my fabric off cuts?

If they are carrying your waste, they must be able to show you their waste carrier licence from the relevant regulator.

What do I have to do if I want to transport my waste myself?

This is no problem if you transport your own waste and still carry out your duty of care for disposal of the waste **unless** you are defined as being in the building trade.

What is meant by 'building trade'?

This includes anyone who is involved in construction, demolition, improvement, repair or alteration to buildings – even work such as plumbing and carpet laying. These organisations must register as a carrier.

What happens if I have to pick up some old furniture when I deliver a new settee?

Your organisation can remove its own waste from the materials you brought on site without a licence. However, if you remove waste that belongs to anyone else then you need a licence.

What about waste transfer notes?

Whenever waste changes hands, both sides must have a record of the transfer – the waste transfer note. The waste transfer note gives a description of the waste, the quantity, who had the waste and who is taking it away. Your waste carrier normally provides transfer notes, but you can print your own. Your waste carrier may decide to reduce the paperwork and issue an annual waste transfer note. You must keep your copy of the transfer note for at least **two years**.

Does that complete my duty of care?

You must take reasonable care to ensure the waste carrier disposes of your waste at a disposal site that is authorised to take it. Always be suspicious of organisations or individuals that offer to remove your waste 'on the cheap'. Be extra careful with hazardous materials – disposing of these requires much more stringent controls.

Are there any exceptions to these duty-of-care requirements?

Household waste (i.e. waste that comes from domestic premises) is an exception. However, putting commercial or industrial waste in with the domestic waste is illegal.

Other exceptions are agricultural waste, and some wastes from mining and quarrying.

What is producer responsibility for waste?

Producer responsibility laws require organisations to reuse, recycle and recover other value from waste that comes from products they produce. Under these regulations, 'producers' are businesses who import, make or sell products that end up becoming waste packaging, waste batteries or waste electrical and electronic equipment when they are thrown away. If you are a producer, you will have to register directly with your local regulator or through a compliance scheme.

3.3 Hazardous wastes

3.3.1 What are hazardous wastes?

These are wastes that are harmful to human health or the environment.

The legal definition of a hazardous waste is extremely complicated (the revised Waste Framework Directive has brought changes to the Hazardous Waste Regulations).

If you have any concerns, contact your local regulator.

How do I know if I have hazardous waste?

Start with a common-sense definition

Would you be happy for adults, children or animals to eat, drink or handle the waste that your organisation generates? If you are not, then it is probably a hazardous waste.

Now look at your waste more closely

- Make a list of the hazardous materials that your organisation buys, uses or sells. If the materials have hazard symbols on the labels (e.g. flammable, corrosive, toxic) or have safety data sheets, you probably have hazardous waste.

  Materials considered to be hazardous include building wastes containing asbestos, engine oils, lead-acid batteries, acids, fluorescent lamps, materials containing volatile solvents (e.g. paints and adhesives), prescription medicines, pesticides, and other toxic and flammable materials.
- Check the safety data sheet. Unfortunately, the disposal instructions are often too general to be of use – if you have any concerns, contact your supplier.
- Talk to the organisation that removes your waste and ask for its advice.
- Contact the Environment Agency for advice.

But isn't there an official list somewhere?

Yes, there is – the European Waste Catalogue and Annex VI of the Classification, Labelling and Packaging Substances Regulation. However, these can be complicated to use. Therefore, it is probably quicker and more helpful to seek advice as outlined above. The Environment Agency has guidance on what is classed as hazardous waste.

How do I dispose of hazardous waste?

You must find a reputable waste carrier that is licensed to carry hazardous waste. In addition, insist that you see the company's licence to carry your type of waste. A list of hazardous waste carriers is available from the Environment Agency.

What paperwork do I need to complete?

If you produce or hold hazardous waste at any premises in England and Wales, you must register with your local regulator each year, unless the total quantity is less than 500kg each year. Premises in Scotland or Northern Ireland are not required to register.

If you move or receive hazardous waste, you need to record this and maintain a register of your records. The Environment Agency needs to know where each type of waste came from, its storage, who transported it and who disposed of it or recovered it.

When hazardous waste leaves your premises, a consignment note must be completed – a reputable waste carrier will make sure you get this right. You must keep your copy of the paperwork for three years. Guidance on keeping records can be obtained from the Environment Agency.

Are there any other considerations?

- Hazardous waste must not be mixed or diluted with other waste, non-hazardous waste or anything else, unless you have an appropriate permit.
- Where possible, you must separate hazardous waste that has been mixed.
- If your waste is to be sent for treatment, it is your responsibility to make sure the site is permitted to receive it.
- Clinical waste can only be collected by a waste carrier that is registered to carry this type of waste.
- High-pressure gas canisters are not a hazardous waste unless they contain a hazardous material. However, if they explode in your skip, the carrier's lorry or on the landfill site, you are considered to be responsible.
- Domestic waste is excluded from the definition of hazardous waste, but it is illegal to combine commercial or industrial waste with domestic waste.

3.4 Water legislation

The use and disposal of water are governed by several different pieces of legislation. This section gives an overview of the relevant legislation and the steps you can take to comply with it.

3.4.1 Water in

Firstly, consider the water that comes into your premises.

- Most organisations use mains water supplied by a water company. If you use water that is abstracted from a borehole, river, stream or lake then you need an abstraction licence from the Environment Agency.

  (Relevant legislation: Water Resources Act 1991)
- If you are using abstracted water for drinking, cooking or food production, then it must meet health and hygiene standards. Contact your local council for advice.

  (Relevant legislation: Private Water Supplies Regulations 1991)
- If you are plumbing-in new installations or fittings, then you must use approved products to avoid waste and backflow contamination of the water supply. Contact a qualified plumber or reputable supplier.

  (Relevant legislation: Water Supply (Water Fittings) Regulations 1999)

3.4.2 Water out

Now consider the water that leaves your premises. The key to understanding the issues is to remember that there are two types of drain:

- **foul water drains** that take dirty water from toilets, washbasins, kitchen sinks, showers, etc to the water company's sewage treatment plant – these are the responsibility of the water company; and
- **surface water drains** that are used to remove rainwater from your premises and then discharge it into local rivers and streams – these are the responsibility of the Environment Agency.

If you dispose of any other liquids to the drain, then you must have a trade-effluent consent or enter into a trade-effluent agreement with the appropriate regulator – either the water company or the Environment Agency.

Why is this important?

Obtaining a consent is very important to prevent problems occurring at the sewage treatment works, pollution problems in rivers and streams, or contamination of drinking water.

It is obvious that some discharges will cause problems (e.g. paint, solvents, oil, hydraulic fluids, cutting fluids, waste chemicals, insecticides, herbicides).

The oil from one car oil-change can contaminate 5,000,000 litres of water and cover a 1.6 hectare lake.

With others, it is less obvious (e.g. steam condensate, compressor blow-down, vehicle washings, floor-washing waste, kitchen waste from maceraters).

Pollution can also be caused by dumping directly into a watercourse.

What do I do if I am concerned about effluent that is entering my drains?

- Check which drain the effluent is entering. You may have a drain plan on the architect's drawings of your premises. In many cases, doing a rough sketch of the drains around your site can be very useful – particularly in highlighting potential pollution areas.
- Check to see whether you already have a trade effluent consent from your water company or Environment Agency. If not, take steps to obtain one.
  - If you intend to discharge to a **foul drain**, you must obtain a consent or written permission from your water company. For advice, contact your local water company – the telephone number will be on your water bill.

    (Relevant legislation: Water Industry Act 1991)

– If you intend to discharge to the **surface water drain**, you must obtain a consent or written permission from the Environment Agency. There is a charge based on the level of effluent discharged.

(Relevant legislation - Water Industry Act 1991)

Can I pour it onto the weed patch at the back of the premises?

Absolutely not! You are liable to be prosecuted if you dispose of it there or anywhere else without the proper consent.

How else can I dispose of it?

Make sure that the material is collected by a reputable waste carrier that is licensed to remove that specific material. Avoid waste companies that offer to dispose of your waste cheaply as you will be held responsible if they 'fly tip' it.

What if there is an accidental spillage?

Minimise the amount that enters the drain using sand, earth or a spillage kit. Then contact either the water company (foul drain) or the Environment Agency (surface water drain) immediately.

- Environment Agency Emergency Hotline: 0800 80 70 60

What can I do to prevent a spillage happening?

- Think about those materials that might cause a problem and how spillages may occur during delivery, storage, use and collection.
- Consider whether vandals could cause a pollution incident at your premises. Courts may find you responsible and you could end up paying a fine and for the clean-up costs.
- Consider **bunding** to contain any possible spillages. This is a drip tray/walled area that will contain any spills within it. Bunding is compulsory for premises that store more than 200 litres of oil.

(Relevant legislation: Control of Pollution (Oil Storage) Regulations 2001)

3.5 Health and safety

Health and safety regulations apply to everyone at work - whether in an office, factory or working outdoors.

If you are an employer or are self-employed, then you have a legal duty to ensure, '**as far as is reasonably practicable**, the health, safety and welfare' of:

- yourself;
- anyone who is working for you;
- any visitors or contractors working at your premises; and
- anyone passing by or even an intruder.

If you are an employee, then you have the same duty to your fellow employees.

The key action you can take is to **assess the risk**, and then take **sensible actions** based on that assessment.

Don't panic! Below is an example of how you perform a risk assessment each time you cross the road.

What could go wrong?

– I could be hit by a car.

How likely is it?

– It is dark, wet and they are travelling fast – very likely.

What would the consequences be?

– I could get killed.

What preventive action should I take?

– Wait or go to a pedestrian crossing.

The only real difference between this example and a risk assessment at work is that a work risk assessment must be written down.

A good starting point might be to create a standard form with the following column headings:

- What is the hazard?
- What is the likelihood of it happening?
- How serious is the potential consequence?
- What action is required?

Make assessments under these headings for **substances**, **activities**, **noise and fire**.

3.5.1 Do you use any substances that are hazardous to health?

You do if you use products or chemicals with hazard symbols on the labels (e.g. flammable, corrosive, toxic) or that have safety data sheets. The COSHH Regulations state that you must carry out a risk assessment for any potentially dangerous substances.

The actions you may need to take include:

- replacing hazardous substances with less harmful substances;
- controlling and reducing employee exposure to hazardous substances; and
- providing training and protective equipment for employees.

3.5.2 Do you carry out activities that could be hazardous?

Under the Management of Health and Safety at Work Regulations 1999, you have a duty to carry out a risk assessment for every activity that might result in an injury. Actions you may need to take include:

- investigating alternative working methods;
- ensuring proper control over operations;
- finding ways to reduce any risk to employees;
- ensuring regular maintenance of equipment and machinery; and
- providing training and personal protective equipment for employees.

Don't forget to include **office activities** that are also subject to health and safety legislation. For example, working with computers (Health and Safety (Display Screen Equipment) Regulations 1992) and lifting and handling (Manual Handling Operations Regulations 1992).

Are your activities making too much **noise**? If you have to raise your voice to be heard, the noise levels may be unacceptably high, as identified in the Control of Noise at Work Regulations 2005.

It is very important to do a fire-risk assessment. Ask yourself:

- How could it start?
- Who would be affected?
- How could the risk be reduced?

Then, review your fire precautions, detection equipment and means of escape.

3.5.3 Do you have compressed air or other pressurised systems?

If so, there are extensive requirements in the Pressure Systems and Transportable Gas Containers Regulations 1989 for testing, maintenance and record keeping.

3.5.4 Other legal requirements regarding health and safety

- **Insurance** – employer's liability insurance is compulsory so as to compensate employees (and others) if an accident does occur.
- **Health and safety poster** – the health and safety law poster must be displayed at all times.
- **Health and safety policy** – all workplaces must have a written policy setting out how the organisation intends to organise and plan for safety at work.
- **Accidents** – all employers are obliged to report serious accidents at work to the Health & Safety Executive.
- **Electricity** – all portable electrical equipment (e.g. computers, kettles, extension leads) must be checked regularly by a competent person.
- **Asbestos** – asbestos problems must be identified and dealt with in the appropriate way.
- **Lead** – lead solder requires a similar approach to other substances governed by the COSHH Regulations.
- **First aid** – an employer must provide adequate and appropriate first aid equipment and facilities.
- **Safety signs** – where there are specific risks to employees, relevant, approved safety signs should be displayed.

For further advice on any health and safety matters, contact your local office of the Health and Safety Executive or visit its website (www.hse.gov.uk).

4 Management tools

4.1 Writing an environmental policy

An environmental policy is a clear statement of objectives that outlines an organisation's intention to minimise its impact on the environment. It demonstrates commitment and provides a starting point for action.

4.1.1 Do you need one?

The following may ask you for details of your environmental policy:

- local authority/government;
- larger organisations;
- customers;
- banks/insurance companies; and
- professional/trade associations.

Having a policy can also be a marketing advantage and may help you to gain business.

4.1.2 How do you write one?

1. Spend about five minutes thinking about what impact your organisation has on the environment.
2. From the list below, tick up to five areas you can control:
   - ☐ compliance with legislation;
   - ☐ use of resources;
   - ☐ waste;
   - ☐ transport;
   - ☐ energy use;
   - ☐ smell/noise;
   - ☐ water;
   - ☐ air;
   - ☐ staff environmental awareness;
   - ☐ building(s) and site management; and
   - ☐ buying/procuring policy.
3. Write down a simple statement for each (a maximum of two sentences) saying how you will manage/improve these areas.
4. Make it realistic and achievable.
5. Sign and date it. Then take steps to implement it – see the rest of this guide for further help.

4.1.3 Sample environmental policy

Environmental Policy Statement

We hereby make the following commitment to reduce our effect on the environment:

In all our activities, we will continuously work towards reducing our impacts on the environment.

To work towards this commitment, we will:

- meet all the regulatory and consent requirements relevant to our business;
- use raw materials carefully, considering relevant issues such as local purchasing;
- reduce our energy consumption through measures such as increased energy efficiency;
- create less waste by introducing resource efficiency measures; and
- manage our premises in an environmentally sensitive manner.

This will be achieved by raising employee awareness and incorporating environmental issues into the day-to-day running of our business.

Signed .....

Dated .....

Preventing waste in the first place should be your highest priority.

4.2 Action planning

When turning an environmental policy into action, it is best to keep things simple.

1. Look at all the key areas identified in your environmental policy.
2. Prioritise them and choose two that you are going to address this year.
3. List a maximum of three actions you will take to address each issue.
4. Make a table such as the one shown in Table 1. This identifies what the action is, who is going to be responsible for it and when they aim to have achieved it. The cost and saving columns are optional. Most environmental improvements are at no cost and often produce useful savings. It can be encouraging to communicate the actions throughout the organisation and report on progress regularly to keep people motivated.
5. Set dates to review progress and for an annual review of the actions.

4.3 Sustainable development and environmental management systems

4.3.1 Sustainable development

Sustainable development is development that doesn't damage the environment faster than it can repair itself. For businesses, this means looking at a wider perspective than just the economic one. The three focus areas are social, economic and environmental.

What can you do?

Think about where your raw materials come from.

- Are they local (reduces transport impact)?
- Are they renewable (e.g. wood)?

Do you manage the resources you use?

Look at the **waste** you create.

- Think about your processes and how you could do things differently to create less waste.
- All organisations should aim to prevent waste from the outset. However, if this is not possible, then consider reusing, recycling or recovering other value (e.g. energy).

The later in the process you address the issue of waste, the more it will cost your organisation because additional time and money will have been spent at each stage. This is why preventing waste in the first place should be your highest priority.

Consider how much **energy** (electricity, gas, diesel, etc) you use.

- Can you do things differently so that you use less energy?
- Can you use renewable energy instead, either directly by generating your own or indirectly by buying it locally, regionally or nationally?

Think about the **water** you use.

- Can you do things differently so that you use less water?
- Find out what is disposed of to the foul and surface drains apart from water.
- Can you change the way you do things so that you don't end up with effluent to dispose of?

Table 1: A completed table of actions

Action	Responsible	Target date	Cost	Saving
Fix leaking oil tank	John Smith	20 March 2012	£100	£1 of oil lost every day = £365/year
Fix dripping tap	John Smith	20 March 2012	£50 including labour	£400/year
Replace expired bulbs with energy efficient bulbs	Paul Davis	As bulbs need changing	£1-2 each	£3 per year per bulb
Replace old printer with double-sided printer	Janet Jones	1 September 2012	£700	Saving of £650/year
Date: 20 March 2012. **Review one year from now.**				

Do you have any emissions to air?

- Does your organisation use a chimney?
- Do you have fume cupboards?
- Do you have extractor fans?
- Do you use chemicals in any part of your process?

Does your organisation improve the quality of life of its stakeholders?

Your stakeholders could include employees, shareholders, customers, sub-contractors and local residents. Your actions affect all of these.

- Think about how you may improve their quality of life through actions such as better training of staff and improving the local environment.
- Do you consider the biodiversity of the area around your premises? This means the local habitats and how you might enhance them (e.g. building a pond, erecting nest boxes and creating a wildflower meadow on land held by your organisation). This could reduce costs for grass cutting, etc.

If you intend to manage your environmental impacts, you may want to set up an environmental management system, as described below.

4.3.2 Environmental management systems

Increasingly, organisations are recognising that the environment is a management issue and not just a matter of compliance. An environmental management system (EMS) is a systematic approach to managing your organisation's impacts on the environment. Having and following an EMS is voluntary, but organisations with an EMS have an explicit commitment to continual environmental improvement.

Setting up an EMS will provide your organisation with a framework through which its environmental performance can be controlled and improved.

An EMS:

- is a mechanism for defining environmental responsibilities for all staff, helping them to understand the environmental impact of their activities and their individual actions;
- ensures that all operations have procedures that minimise their impacts;
- records environmental performance against set targets;
- can be audited; and
- will help you identify opportunities to reduce waste and thus reduce your operating costs.

To implement an effective EMS, you need to have a good knowledge of your organisation's processes and practices, and understand its impacts on the environment. With this information, you will be able to easily identify how to improve efficiency, reduce costs and improve profits.

Although many organisations have already made significant improvements in their environmental performance, an EMS will ensure that improvements continue through ongoing development of the system, and using measuring and monitoring techniques to track progress. An EMS also ensures that environmental performance and other related issues are raised regularly with senior management and that the momentum for making improvements is maintained.

The following three strategies are available to organisations wishing to implement an EMS:

- develop their own in-house EMS;
- follow the guidelines of the International Standard ISO 14001, the EC's Eco-Management and Audit Scheme (EMAS) or the British Standard BS 8555 (designed specifically for SMEs), but do not pursue formal certification/verification to these standards; and
- pursue formal certification/verification to these standards.

All three strategies are voluntary, but differ in their scope and approach. The choice depends on what is right for your organisation. The WRAP Resource Efficiency Helpline (0808 100 2040) may be able to help you decide which approach is best for your circumstances.

5 Business sectors

Reducing waste and making the best use of resources not only benefits the environment, it also delivers advantages such as enhanced brand value, reduced costs and increased customer loyalty.

This section gives an overview of the business activities SMEs may be involved in and the environmental issues that they could face in their day-to-day activities. Sectors covered include retail, hotels, manufacturing and metal engineering, offices, vehicle repair garages, catering and food production, and printers. Your organisation may not fall directly under any of the particular categories outlined. However, do not let this deter you from having a look through the information provided as you will find there are issues that are still going to be relevant – particularly the section on offices. You will find information on good resource management, what waste reduction entails, water use and how to avoid wasting water, reducing the use of packaging, how to use heating and lighting more efficiently, solvent recovery and how to dispose of chemical waste.

5.1 Retailers

The retail sector produces a significant amount of waste – the most recent survey[3] indicates this to be over 9 million tonnes/year. The disposal costs alone of this waste are likely to be about £400 million. When the true cost of waste is factored in (e.g. lost time, materials, water, treatment and storage costs), the actual cost is likely to be over £2 billion.

Reducing waste and making the best use of resources not only benefits the environment, it also delivers advantages such as enhanced brand value, reduced costs and increased customer loyalty.

[3] Commercial and Industrial Waste Survey 2009

Lighting accounts for 20% of all electrical energy use.

5.1.1 Packaging waste

Have you considered reducing costs by auditing your packaging waste?

The best way to reduce packaging waste is to try and prevent it being produced in the first place.

- Ask suppliers to use reusable packaging and deliver your products in reusable packaging where possible.
- Avoid contaminating packaging with other materials, such as glue, and try to design it so that the components can easily be segregated for reuse or recycling.
- Reuse materials such as bubble wrap, boxes, pallets and crates for regular deliveries.

If your organisation handles over **50 tonnes of packaging annually** and has a turnover of over **£2 million/year**, then you need to comply with the Producer Responsibility Obligations (Packaging Waste) Regulations 2007 to recover a minimum percentage of the packaging you produce.

5.1.2 Transport and distribution

Whether you have your own distribution network or rely on a third party:

- ensure that your transport policies are reviewed regularly, that vehicles are maintained in good order and that drivers receive training in efficient driving (driving at between 50mph and 55mph instead of 70mph will reduce fuel consumption by about 30%);
- try to source your supplies locally and, when delivering, consider whether a commercial carrier could deliver the goods more efficiently and at lower cost; and
- see if you can reduce the number of journeys made by maximising loads and effective route planning (25% of lorries on the road are empty).

5.1.3 Resource efficiency

Here are some ideas that have already worked for a range of organisations in the retail sector:

- set budgets and benchmarks for key materials, utilities and waste management costs;
- arrange for returns and unsold products to be sent back to suppliers;
- follow the principles of the waste hierarchy (i.e. prevent, reuse, recycle or obtain other value);
- make sure that heating, boiler, air-conditioning and lighting systems are correctly programmed and maintained; and
- fit water saving devices in toilets, washrooms and kitchens/canteens.

5.1.4 Staff motivation

The success of any measures you undertake to cut costs and reduce your environmental impact will depend greatly on the commitment of those involved. Ways to motivate staff include:

- develop reward schemes to encourage improved resource efficiency and waste reduction;
- appoint a resource efficiency champion to co-ordinate your cost-saving efforts;
- train all staff in good practice by including relevant issues in induction briefings and carry out refresher training every year.

The greatest savings can only be achieved with the full commitment of staff throughout the organisation. By ensuring that your employees are able to participate and feel some degree of ownership for cost-saving initiatives, you will maximise the effectiveness of the programme.

5.1.5 Energy

Are you using lighting efficiently?

Lighting accounts for 20% of all electrical energy use. The easiest ways of making savings in this area are to switch off unnecessary lighting and to encourage a 'switch-off' culture among employees.

Labelling or colour-coding switches is an excellent way of promoting this. A simple system is:

Red = Don't turn it off.
Orange = Specified personnel can turn it off when it is not in use.
Green = Anyone can turn it off when it is not in use.

A number of other techniques can be used to ensure that the lighting is at its most efficient:

- **localised switching** allows lighting to be customised to best suit the time of day or area;
- **time switching** saves energy by switching lights on/off automatically according to the time of day;
- **daylight linking by on/off or dimming control** varies the level of light throughout the day in response to the amount of natural light available; and
- **occupancy controlled switching** is suitable for stockrooms and ancillary areas because lights are turned off when the room is unoccupied.

If you are planning to refurbish or put up new buildings, consider these factors for maximum efficiency in the new lighting system:

- maximise the availability of natural light;
- tailor light levels for different areas such as aisles and checkouts;
- ease of maintenance and monitoring;
- user-friendly controls for time-of-day variations;
- adequate electrical connectors for future flexibility;
- incorporating safety and security requirements; and
- the legal obligations of the Building Regulations (amended in 2010).

Are your refrigerators running efficiently?

Refrigeration costs for retailers can be substantial and, for food retailers, refrigeration is the primary use of energy.

Simple measures can be taken to greatly increase efficiency and realistically reduce energy consumption by between 15% and 20%. Consider the following:

- maintain your equipment – clean filters and grilles regularly and repair damaged insulation;
- do not overstock as it could block air ducts – train staff in how it should be done;
- on open-type units, use night blinds or PVC strip curtains;
- do not stock cabinets with produce that is above the desired display temperature. Cabinets are not designed to cool produce – only maintain its temperature;
- check that the unit is not running at a temperature lower than necessary;
- make sure cabinets are not placed in hot areas with inadequate ventilation; and
- education is important – prepare simple and clear instruction sheets.

The success of any initiative depends on management commitment and employee involvement and training.

5.2 Hotels

Is your hotel wasting money and resources through inefficiency? This section is designed to help hotels cut costs and reduce their environmental impacts.

5.2.1 Guest involvement

Inform guests of how they can help to save resources using a guest information pack. In addition to information on local facilities and attractions, promote your environmental initiatives and encourage guests to:

- only have their towels, linen and bathroom toiletries changed daily if required. Either provide door handle signs for guests to use if they require something to be replaced or ask them to put towels into the bath if they wish them to be changed;
- turn down the heating/cooling system rather than open a window; and
- switch off lights and other appliances when the room is unoccupied.

5.2.2 Staff involvement

The success of any initiative depends on management commitment and employee involvement and training.

- Try to generate a general 'switch-off' culture in the hotel. From lighting to ovens, make sure they are turned off when not in use.
- Conduct an 'energy and waste tour' of the hotel, inspecting the entire premises and identifying resource-saving practices or investments.
- Once identified, make sure that employees put these practices into action. Designate a member of staff to be responsible for equipment and good practice checks at various times throughout the day.
- Draw up a room assignment plan and try to assign guests to adjoining rooms to centralise occupancy, thus reducing space heating and lighting costs.
- Instruct housekeepers to use natural light where possible when preparing guest rooms.
- Ensure staff close curtains and switch off appliances, such as towel heaters, when rooms are unoccupied.
- Turn off televisions completely (i.e. not left in standby mode) when rooms are empty.

5.2.3 Water

- Various technologies now exist to save water in guest rooms and lavatories. Tap aerators and flow restrictors are low-cost solutions and can reduce water use by up to 70%. Where suitable, fit older 9-litre WC cisterns with volume adjusters, which will reduce the amount of water per flush by up to 2 litres.
- Check taps regularly in all bathrooms. A dripping tap will waste at least 5,500 litres of water per year. If hot water taps are leaking, you are paying to heat the water, as well as for the water itself and the disposal costs.
- Restrict the watering of grounds to mornings and evenings to minimise losses through evaporation.

5.2.4 Laundry

- Operate all equipment at full capacity and use the minimum required temperature.
- Dry laundry in a steady stream, as opposed to a stop-start schedule throughout the day, to make use of residual heat.
- To prevent water pollution, consider using phosphate-free detergents.

5.2.5 Purchasing

- Where possible, source your materials locally. This will significantly reduce transportation costs and damage to the environment.
- Select suppliers that will provide goods in returnable packaging.
- Use refillable bath soap, shampoo and hand rinse lotion dispensers for guest rooms to eliminate bar soap and packaging waste.

5.2.6 Recycling

- Segregate your waste and provide areas where guests can dispose of waste in designated bins for recycling.
- Speak to your waste removal company to find out which materials should be separated and whether it can supply specific bins for each.

Heating and cooling with air-conditioning is very expensive and simple measures can lead to significant cost savings.

5.2.7 Lighting

Are you making the best use of natural light in the hotel?

Natural light is free and creates a pleasant environment. Encourage the use of natural light by:

- placing workstations near windows and skylights;
- keeping windows clean and unobstructed; and
- installing blinds so that glare and solar heat gain can be eliminated if necessary.

Are you using artificial lighting efficiently?

Measures that can be taken to improve the efficiency of artificial lighting include:

- replace expired tungsten filament light bulbs with compact fluorescent lamps (CFLs), which use around 25% of the energy for the same light output and they last much longer;
- ensure light fittings are kept clean because dirty diffusers can reduce light output by 50%;
- encourage staff to always turn off lights when no longer needed. Colour coding switches (so that they know which ones they can safely switch off) can help this process; and
- look at the feasibility of fitting external lighting systems with daylight detectors.

The Carbon Trust offers leases, loans and other financing options from £1,000 for energy saving equipment.

5.2.8 Heating and air-conditioning

Are you heating and cooling your hotel efficiently?

Heating and cooling with air-conditioning is very expensive and simple measures can lead to significant cost savings.

- Close windows and doors when the heating or air-conditioning is on. Staff should also close curtains or blinds to stop heat escaping in winter and prevent solar heat gain in summer.
- Check your roof spaces for adequate insulation. About 25% of a building's heat can escape through the roof if it is not insulated. Insulating your roof can reduce this loss by up to 90% – 250mm (10 inches) thickness should be sufficient.
- Adjustable controls in rooms allow guests to set heating/cooling as they require it.
- Install double glazing – 50% of heat loss is through windows.
- Changing to a condensing boiler can improve efficiency by up to 20% compared with older boilers. The Enhanced Capital Allowance (ECA) scheme offers tax savings when investing in energy efficient equipment. Visit the website (http://etl.decc.gov.uk/) for more information.
- When rooms are seasonally unoccupied, ensure that thermostats are adjusted to prevent damp problems.
- Regularly service air-conditioning and heating units to keep them working safely and efficiently.
- Turning down the thermostat by just 1°C can reduce heating costs by up to 10%.
- Consider other ways of cooling such as ceiling fans or improved ventilation.

5.2.9 Kitchens

Are your cooking procedures and equipment working efficiently?

Hotel kitchens use a substantial amount of energy and offer many opportunities to reduce waste.

- Use the correct size of pan for the hob and the correct size of oven for different dishes.
- Do not preheat cookers for longer than is necessary. Some kitchens turn on the ovens at the start of every day, regardless of when they are to be used.
- When purchasing new kitchen equipment, consider induction cooking equipment. Induction hobs cost more to buy, but can be up to 50% more efficient than conventional electric hobs.
- Consider heat exchangers to recover lost heat from cooking (and refrigeration) appliances. These can be used, among other things, to preheat hot water systems.
- Keep kitchen equipment well maintained and serviced.

5.2.10 Catering waste

- Catering waste must not be fed to farm animals.
- Catering waste must be disposed of correctly through:
  - licensed landfill sites;
  - approved composting plants;
  - approved biogas plants;
  - incineration plants; and
  - approved rendering plants.
- Waste cooking oils should be stored properly so that none is allowed to spill and it should only be collected by an authorised collector. It should not be:
  - poured down the drain;
  - disposed of at a household recycling centre;
  - used as an ingredient in animal feed; or
  - sent to landfill.
- If you have a garden or suitable area, consider composting raw vegetable and food scraps (e.g. peelings, eggshells and tea bags).

5.3 Manufacturing and metal engineering

5.3.1 What are your environmental issues?

For most small manufacturing companies, there are four key issues.

1. **Reducing waste and increasing profit.**
   Waste reduction is not just important for the environment, but is a major cost-saving area that should be made a priority.
2. **Complying with legislation.**
   The vast majority of environmental legal problems arise from waste disposal and spillages. If you use hazardous chemicals or processes, this is where you need to concentrate your efforts.
3. **The impact on employees, neighbours, the community and the environment.**
   In many cases, you have a legal obligation as well as a desire to protect others from litter, smells, dust and noise produced by your organisation.
4. **Customer concerns.**
   Find out if your customers are concerned about the environment – are they looking for environmentally aware suppliers and resource-saving products?

5.3.2 What can you do to address these issues?

You should be able to do this in four simple steps, using just one sheet of paper.

1. Write down, step-by-step, the process flow in your organisation from raw material delivery through to packing and dispatch.
   At each process step, record the main raw materials used, noting large energy or water consumption and any potential problem materials that might be hazardous. While you are doing this, it will become clear which waste materials are being generated – write these down next to the process step.

You have now carried out a simple waste mapping exercise and can probably already see some waste creation points where savings can be made. To find out more about waste mapping, see WRAP's 'Waste Mapping: Your Route to More Profit' available at www.wrap.org.uk

2. Look at the waste map that you have drawn and circle the materials and wastes that are major costs or potential environmental concerns. Bear in mind the following:
   - hazardous materials and hazardous waste inevitably carry health, safety and environmental risks, and are subject to legislation;
   - waste must always be disposed of responsibly and legally;
   - organisations need to minimise resource use (materials, energy and water), thus benefiting their bottom line as well as the environment;
   - waste does not add any value to a product or service – consider how much it costs to generate and dispose of it;

- many organisations have made savings of up to £1,000 for each employee through simple changes and these savings go straight to the bottom line; and
- consider whether your materials and wastes could cause problems for your employees and neighbours in terms of litter, fumes, health concerns, etc.

3. Put values against the materials and wastes you have circled. What do they cost? How much do they weigh? How many bins or other containers are used? Multiply the daily, weekly or monthly figure to give a yearly figure. It is likely that some of the figures may surprise you.

   Ask yourself questions about your processes.

   - How much raw material goes into the product and how much ends up on the floor or in the skip?
   - How much cutting fluid is used?
   - What is the cost of leaving the lights and machinery on?
   - Why are the effluent charges so high?
   - Why do we spend that much on packaging tape?
   - How much is special delivery costing?

4. Now prioritise a few of the major problems. You can't solve all of them straight away, so choose the ones with the biggest savings or environmental improvement. Set yourself a target date for completion.

   If you are stuck for ideas, contact the WRAP Resource Efficiency Helpline on 0800 100 2040, which may be able to provide you with details of an organisation that has already solved a similar problem or can put you in contact with an expert who can help.

5.3.3 How can you make sure that you comply with legislation?

In addition to referring to Section 3 of this guide, look at your waste map and highlight all the problem materials (e.g. chemicals, oils, cutting fluids, cleaning materials) that you use or have on site. If they are hazardous, then you can find a lot of information on safety data sheets that suppliers must provide.

- If you put hazardous materials down the drain, you must have a licence from your water company (or the Environment Agency if it goes to a storm drain or watercourse).
- When a hazardous material becomes a waste, you will probably need to dispose of it as a hazardous waste.
- Think hard about the possible accidents where the hazardous material could enter a drain or contaminate a watercourse (e.g. oil seeping out of swarf in a skip). Decide how to prevent this happening – remember that an oil spill resulting from, for example, vandals breaking the sight glass on your diesel tank, could lead to you being prosecuted and having to pay the clean-up costs.
- Remember that you have a duty of care to dispose of waste correctly – use a licensed waste carrier and make sure you get a waste transfer note from them. General waste should be segregated where there is a recycling opportunity.

5.3.4 What about customer concerns?

Customers and consumers are increasingly concerned about the environmental performance of suppliers. To see it from their perspective, add to your waste map the additional steps of transport, customer or consumer use and final disposal. Add in the raw materials and waste at each step. Now stand back and look at it from the customer or consumer's viewpoint. Are they concerned about the type of raw materials you use (e.g. lead solder)? Do they require the type of packaging used? Have you considered consumer energy use? Will your product eventually end up in a landfill or can it be reused or recycled?

Simple measures can significantly reduce office waste and generate worthwhile cost savings.

5.4 Offices

This section outlines ways in which people working in offices can cut costs and reduce their impact on the environment through simple measures to promote efficient use of resources.

5.4.1 Waste

Are you throwing away items that could be reused, recycled or used for other value (e.g. energy)?

Simple measures can significantly reduce office waste and generate worthwhile cost savings.

- Use both sides of paper to reduce usage by up to 50%. Ensure that all printers are set to double-sided format as default. Question whether you need to print draft copies at all. If this is unavoidable, print four pages to an A4 sheet and then recycle. Put reminder posters near printers and photocopiers.
- Consider introducing specialist software that monitors printer and photocopier use. This software can also be used to allocate allowances to individuals or departments, with the aim of making people think more carefully about what they need to print.
- Reuse envelopes for internal mail and reuse other packaging material to cut the cost of buying and disposing of these items (e.g. use paper boxes to store documents).
- Post information on a central notice-board to greatly reduce the need for copying.
- Segregate unavoidable waste (e.g. printer cartridges) and recycle it. Some recyclers offer free collection and cash for used toner cartridges.

Are you paying for excessive water use?

A good-practice office building should be using no more than 6.5m^3 (6,500 litres) of water per person per year (or 25 litres per staff member per day). Where an office has a canteen – that cooks meals from raw ingredients, then the water use associated with the preparation, cooking and cleaning will increase to around 40 litres per staff member per day. Water use can be reduced by installing:

- cistern volume adjustors – bags or plastic bottles that reduce toilet flush volume;
- taps with infrared hand sensors or self-closing taps;
- flow restrictors on taps; and
- urinal flush controls/waterless urinals.

Are you producing excessive waste in the canteen?

Look at areas where you may be able to implement simple measures.

- Provide reusable cutlery and crockery.
- Replace bottled water with water coolers that are attached to the water supply, this will reduce service charges incurred from the use of bottles, transportation and packaging.
- Ensure that vending machines allow the use of china mugs rather than plastic vending cups.
- Avoid purchasing disposable catering products (e.g. individual milk containers, sugar sachets and paper plates).

5.4.2 Energy

Are you managing your electricity use effectively?

- Effectively measuring energy use is the first step to controlling it and then reducing it.
- Your electricity provider is obliged to advise you of the most favourable tariff for your pattern of use, so make sure that you're on it.
- A 'switch-off' culture is vital to improve efficiency and can save up to 15%. Ensure employees know which equipment or lights they can turn off by labelling the switches.

Are you paying for extra lighting that is not needed?

Using natural light rather than artificial light saves resources and creates a better working environment. Make maximum use of this free resource by:

- ensuring that windows are clean and not obscured by office furniture;
- positioning workstations to take best advantage of natural light; and
- using window blinds in the summer to prevent excessive solar heat gain and glare.

In addition to using natural light, increase the efficiency of your artificial office lighting by:

- making sure lights are switched off when not in use;
- using occupancy controlled lights in areas such as lavatories and store rooms;
- fitting pull switches to enable staff to light up their area only when they need to; and
- replacing expired tungsten filament light bulbs with compact fluorescent lamps (CFL), which use around 25% of the energy for the same light output and last much longer.

The Carbon Trust offers leases, loans and other financing options from £1,000 upwards for energy saving equipment.

Are you using your office equipment efficiently?

- Purchase equipment with the EU ENERGY STAR® standard or similar.
- Make sure the energy saving features are enabled.
- Ensure that non-essential equipment is switched off completely at night.
- Ensure appliances, such as refrigerators, are rated as energy efficient.
- Remember that boiling the kettle with twice the water you need uses twice the energy.

Do you really need air-conditioning to cool your office?

Air-conditioning is expensive and many people prefer a naturally ventilated office. You could perhaps create a better working environment and save money by switching off the air-conditioning system. Consider the following:

- if refurbishing, think about building cooling systems that save energy by using the building's fabric to cool the office;
- if air-conditioning is unavoidable, use variable speed fans and pumps to save energy by increasing control;
- set air-conditioning to come on only when the temperature exceeds 24°C; and
- turn off heating and cooling in unoccupied rooms, making sure they are well ventilated to prevent condensation and mould forming.

Are you wasting money on heating?

- Check boilers and thermostats – a serviced boiler can save up to 10% on heating costs.
- Install instant water heaters where possible, otherwise reduce the temperature of stored hot water (to a minimum of 60°C to avoid Legionella bacteria breeding).
- Use timers and temperature control sensors to control output.
- Turning down a thermostat by just 1°C can reduce heating costs by up to 10%.

All organisations have a duty of care to store and dispose of wastes in a responsible way.

5.5 Vehicle repair garages

This section summarises the key areas where vehicle repair garages have an impact on the environment. It also contains practical advice on how to reduce this impact and save money.

5.5.1 Environmental policy

There are increasing demands from customers and legislation that all organisations reduce their impact on the environment. Therefore, your garage is coming under more environmental scrutiny than ever before. You can respond to this by writing a customised environmental policy (see Section 4.1). This will clarify the areas where you can make the best improvements and show your customers and workforce that you are committed to improving your environmental performance.

5.5.2 Chemicals and waste

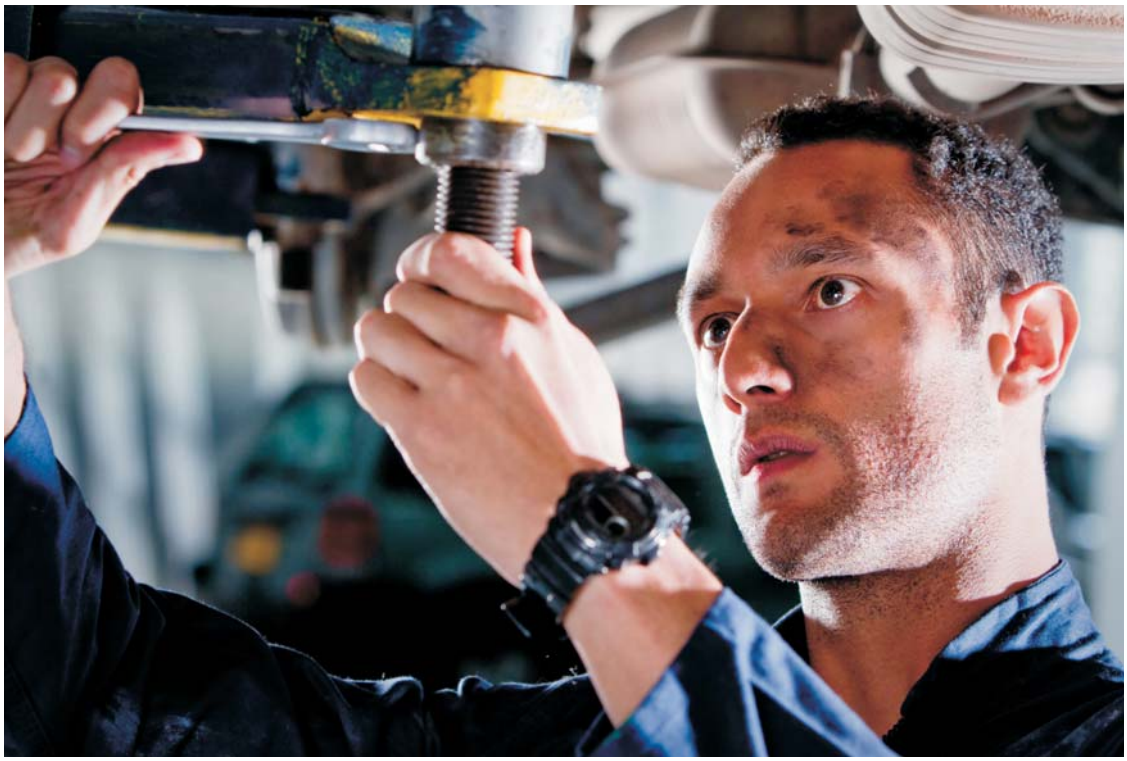
Are you allowing chemicals to enter the drain?

- Install an oil separator to prevent oil discharging into surface water drains. Once installed, separators must be regularly maintained and cleaned to keep them working effectively. It may be useful to keep a log of the maintenance schedule.
- Uncontaminated rainwater from the roof should enter the system downstream of the separator into sealed direct drain points, rather than open grates. Do not allow waste chemicals to enter storm drains – these flow directly into rivers and waterways.
- Make sure that any discharges from parts or vehicle cleaning, compressors and wash basins go straight into the foul sewer (once your water company has granted authorisation for the quantity and concentration).

Are you disposing of your waste legally?

All organisations have a duty of care to store and dispose of wastes in a responsible way. This means ensuring waste does not escape and that a licensed company removes it and supplies a waste transfer note (this should be kept on record for at least **two years**).

- **Hazardous wastes** produced during vehicle repair include waste oil, solvents and oil filters. These must not be discharged into foul sewers and should be removed by a licensed carrier. The paperwork for special wastes should be kept on file for at least **three years**.



- Oil accounts for a quarter of all pollution incidents. Waste lubricating oils must be collected, separated and stored in a bunded tank (i.e. one with a wall or tray to collect leakages). They must be disposed of or recycled by a licensed carrier. For more information on dealing with oil, see the Environment Agency's guidance on the Oil Storage Regulations.
- The risk of **chemical** spills and the cost of disposal can be reduced by minimising their use. For example, radiator fluid coolants contain ethylene glycol and corrosion inhibitors, and must not be discharged to sewer. When repairing a cooling system, uncontaminated coolant can be collected and used to refill the system. This saves the cost of disposal and buying new coolant. Solvents can be reused even when dirty (up to 15% suspended solids), so don't dispose of them after the first use. Providing solvent spray bottles for operators to use instead of solvent-soaked rags can also reduce losses through evaporation.
- **Batteries** that contain acid should be stored in a special battery bin or bunded compound, ensuring that they are intact and upright. Battery cases can be recycled and sold to authorised dealers.
- **Tyres** should never be burnt on site – dispose of them through an authorised incinerator or tyre recycler. Under an Environment Agency S2 exemption, no more than 10 tonnes of tyres can be stored at one time.[4]

5.5.3 Energy

Have you consulted your electricity provider about saving money?

- It is worth comparing the tariffs of electricity supply companies. Figures suggest that this can save up to 20%.
- Your current electricity provider is obliged to advise you of the most favourable tariff for your pattern of use – make sure that you're on it!
- If you are on a maximum demand tariff, improving your power factor can reduce the maximum demand of your installation, which will reduce charges. It will also reduce energy consumption by reducing current in cables and equipment.

Are you using efficient lighting?

- Install energy efficient light bulbs and replace 38mm fluorescent tubes (T12 lamps) with the more efficient and longer lasting 26mm (T8 lamps) type. These will save up to 10% of energy consumption, while giving 10% more light.
- Fit individual workstations with compact fluorescent lamps to improve visibility and allow lighting to be tailored to individual needs.
- Clean diffusers regularly – dirty diffusers can reduce light output by 50%.
- Make sure roof lights and windows are not obstructed and are cleaned regularly.
- Ensure lights are switched off when rooms are unoccupied. Consider fitting occupancy sensors in areas that do not need to be constantly lit, such as stores.
- Good housekeeping can easily save you 15% of your lighting costs.

The Carbon Trust offers leases, loans and other financing options from £1,000 upwards for energy saving equipment.

Is your heating equipment efficient?

- Make sure your boiler is serviced regularly.
- Check your roof spaces for adequate insulation. About 25% of a building's heat can escape through the roof if it is not insulated. Insulating your roof can reduce this loss by up to 90% – 250mm (10 inches) thickness should be sufficient.
- Workshop doors are often opened to increase light levels and improve ventilation even when heaters are on. Install a fume extraction system and roof lights or portable compact fluorescent lights instead.
- If your boiler is due to be replaced, consider installing a condensing boiler. These can reduce costs by as much as 20% and emit much less carbon dioxide compared with lower efficiency boilers. The Enhanced Capital Allowance scheme offers tax savings when investing in energy efficient equipment. Visit http://etl.decc.gov.uk/ for more information.

[4] www.environment-agency.gov.uk/static/documents/Business/S2_exemption.pdf

Are you checking for compressed air leaks?

In some cases, as little as 8% of the total energy supplied to a compressor is converted into useful energy that can do work at the point of use. So it's very important to make sure that compressed air systems are operating as efficiently as possible and that compressed air is not wasted.

- Check the entire system and repair leaks regularly. This can produce cost savings of up to 30%. Losses through a 3mm diameter hole could cost over £1,000/year in wasted energy. Repairing air leaks also allows the compressor to work at a lower pressure.
- Make sure that your compressor is set to the right pressure. Regulating the air pressure to match the end-use can make significant savings. Compressors should not be set to a higher pressure than required. This will also reduce wear and maintenance costs.

Are your compressors located correctly?

You can reduce costs by moving your air inlets outside. For every 10°C reduction in inlet temperature, the compressor efficiency can be improved by 2.5%. Compressing air produces significant amounts of waste heat. This heat could be used for space heating in the workshop, further increasing the efficiency of your compressor.

Are you using excessive paint or solvents for vehicle refinishing?

- Plan your painting jobs to make sure that those using the same colour run sequentially.
- Plastic sheets often make good masking material because they are usually cheap and not too bulky to dispose of.
- Consider solvent recovery. This reduces purchasing, storing and disposal costs. Recovered solvent is ideal for washing spray guns.
- Spray-gun choice can affect efficiency. Consider high volume low pressure (HVLP) technology as transfer efficiency is at least 35% higher.
- Measure and record your paint and solvent use. This will keep you informed of excessive use.

Due to the nature of the industry, a large amount of waste is generated during food production. Reducing this waste can lead to huge savings.

5.6 Catering and food production

This section outlines the main areas in which food producers and caterers impact on the environment. It includes practical measures to minimise this impact and save money.

5.6.1 Waste

Due to the nature of the industry, a large amount of waste is generated during food production. Reducing this waste can lead to huge savings.

Could you reduce the amount of packaging that you use?

WRAP estimates that over 3.4 million tonnes of waste (typically food, glass, paper and card) is produced by hotels, pubs, restaurants and quick-service restaurants each year. Of this, almost 1.5 million tonnes is thrown away, mainly to landfill. The golden rule of reducing waste (and especially packaging) is to **prevent**, **reuse**, **recycle and recover other value (e.g. energy)**. Recovering other value is the least attractive option, but it does prevent packaging waste from going to landfill.

Consider some practical ideas to reduce your waste:

- where possible, ask suppliers to deliver your products in returnable packaging;
- avoid contaminating packaging with other materials like glue and try to design it to ensure that components can be easily segregated for reuse; and
- reuse materials such as bubble wrap, boxes, pallets and crates for regular deliveries.

Simple redesign of packaging can lead to huge savings in materials, handling and disposal costs. It can also help you to comply with the Producer Responsibility Obligations (Packaging Waste) Regulations 2007.

Would you benefit from 'pigging'?

If you need to flush product out of your pipework after production runs, you may benefit significantly from using 'pigs'. These are small rubber plugs that are propelled through pipework after production runs to recover product. They have the multiple advantages of reducing cleaning costs, waste generation, water use, maintenance costs, effluent concentration levels and, therefore, discharge disposal costs.

Is your catering waste being disposed of correctly?

- Catering waste must not be fed to farmed animals.
- Catering waste must be disposed of correctly through:
  - licensed landfill sites;
  - approved composting plants;
  - approved biogas plants;
  - incineration plants; and
  - approved rendering plants.
- Waste cooking oils should be stored properly so that none is allowed to spill and it should only be collected by an authorised collector. It should not be:
  - poured down the drain;
  - disposed of at a household recycling centre;
  - used as an ingredient in animal feed; or
  - sent to landfill.
- If you have a garden or suitable area, consider composting raw vegetable and food scraps (e.g peelings, eggshells and tea bags).

In the busyness of preparing food, it is easy for kitchens to become energy inefficient.

5.6.2 Water

Are you pouring money down the drain?

Many food producers and caterers use vast amounts of water in the product and while cleaning equipment. Simple and cost-effective methods for reducing water use include:

- timely repair of leaks;
- good housekeeping, including educating staff to turn off taps when not in use;
- advising your water company if you use water in your product (supply companies usually assume 95% of water supplied is discharged to the foul sewer and charge you accordingly);
- fitting meters to measure use and ensure early detection of leaks;
- control flow rates and consider flow restrictors;
- using 'dry cleaning' methods before using water (e.g. scrapers, squeegees and brushes);
- making sure cleaning cycles are not excessive (often the case if the same cycle is used for different containers or products); and
- improving product scheduling (aim to run similar products consecutively to minimise changeover cleaning).

Other water saving technologies that involve some investment include:

- steam trapping and condensate recovery;
- upgrading 'flow-through' systems to recirculating, reusing and recycling systems; and
- greater use of cleaning-in-place (CIP) technology.

5.6.3 Energy

Are you using efficient lighting?

- Install energy efficient light bulbs and replace 38mm fluorescent tubes (T12 lamps) with the more efficient and longer lasting 26mm (T8 lamps) type. These will save up to 10% of energy consumption, while giving 10% more light.
- Fit individual workstations with compact fluorescent lamps (CFLs) to improve visibility and allow lighting to be tailored to individual needs.
- Clean diffusers regularly – dirty diffusers can reduce light output by 50%.
- Make sure roof lights and windows are not obstructed and are cleaned regularly.
- Ensure lights are switched off when rooms are unoccupied. Consider fitting occupancy sensors in areas that do not need to be constantly lit, such as stores.
- Good housekeeping can easily save you 15% of your lighting costs.

The Carbon Trust offers leases, loans and other financing options from £1,000 upwards for energy saving equipment.

Are your cooking procedures and equipment working efficiently?

Kitchen equipment uses a substantial amount of energy and in the busyness of preparing food, it is easy for kitchens to become energy inefficient. This must be addressed and employees should be trained to consider their energy use.

- Try to instil a general switch-off culture in the kitchen. From lighting to oven use, make sure it is turned off when not in use.
- Use the correct size of pan for the hob and the correct size of oven for different dishes.
- Do not preheat cookers for longer than is necessary. Some kitchens turn on the ovens at the start of every day, regardless of when they are to be used.
- When purchasing new kitchen equipment, consider induction cooking equipment. Induction hobs cost more to buy, but can be up to 50% more efficient than conventional electric hobs.
- Consider heat exchangers to recover lost heat from cooking (and refrigeration) appliances. These can be used, among other things, to preheat hot water systems.
- Keep kitchen equipment well maintained and serviced.

5.6.4 Purchasing

Try to source your materials locally. This will significantly reduce transportation costs and the impact on the environment. Food bought locally, from local suppliers, will also help the local economy.

5.7 Printers

This section summarises the key areas of environmental impact in the printing industry, and includes simple measures to reduce this impact and increase profits.

5.7.1 Environmental policy

It is essential in the printing industry to have a well-considered and meaningful environmental policy (see Section 4). To succeed in this highly competitive market, it is important to respond to increasing customer demands for environmentally responsible products. Reducing waste and energy use is a strategy that will help to secure business, ensure legal compliance and maximise operating efficiency.

5.7.2 Substrate

Are you managing your substrate effectively?

It is estimated that the average substrate waste is 17%, within a range of 7% to 33%.

- Check your substrate on arrival and return it to the supplier if damaged. Substrate becomes more 'valuable' after every stage in the printing process.
- Make sure staff prepare the press properly to avoid wasting large amounts of ink and substrate.
- Computer-controlled, ink-fed systems linked to a scanner can reduce set-up times, and ink and paper waste.
- Offer customers the option to use chlorine-free paper. This can provide a finished product of equal quality, but is significantly better for the environment.

One large printing company decided to separate and sort damaged sheets into a variety of sizes. The damaged sheets were then trimmed and reused for make-ready, resulting in an estimated annual saving of £50,000.

Do you have an inventory control system?

Proper planning is vital to an efficient organisation, for example:

- ordering substrate in pre-cut rolls to ensure that trim waste is minimised; and
- sorting jobs to run from light to dark ink, to reduce downtime through press cleaning.

5.7.3 Solvents

Solvents can be very expensive to buy and dispose of. Don't sit back and let them disappear into the air! Solvent loss through evaporation can be minimised by ensuring that:

- containers are not left uncovered;
- containers are of sound construction; and
- chemicals are stored away from sources of heat.

Are you disposing of your solvents correctly?

- Pure solvents are always considered a hazardous waste and must not be disposed of with normal waste.
- Press washes have been developed that are water and citrus-based, and can replace commonly used solvents with less damaging chemicals, which results in cheaper disposal.
- Reclamation of solvents from the printing process is now possible using a condensation plant.
- Controlling the use of these substances is not just a matter of ensuring compliance with current regulations, but of keeping a step ahead of increasingly strict future legislation.

5.7.4 Inks

The overall cost of inks in printed products is typically between 1% and 10% of the finished product cost. However, the trend towards increased use of ink per product and the tightening of profit margins in the printing sector suggest that waste reduction in this area is important.

Are you managing your ink use effectively?

Make sure your inks are stored in the correct containers and areas. Ensuring employees are well trained in the correct ink procedures will save time, ink, substrate, and cleaning and disposal costs.

Could you improve on the type of ink you use?

Improved ink technology has led to the development of inks, such as ultraviolet-cured inks, that have less environmental impact.

5.7.5 Energy

Are you checking for compressed air leaks?

In some cases, as little as 8% of the total energy supplied to a compressor is converted into useful energy that can do work at the point of use. So it's very important to make sure that compressed air systems are operating as efficiently as possible and that compressed air is not wasted.

- Check the entire system and repair leaks regularly. This can result in cost savings of up to 30%. Losses through a 3mm diameter hole could cost over £1,000/year in wasted energy. Repairing air leaks also allows the compressor to work at a lower pressure.
- Make sure that your compressor is set to the right pressure. Regulating the air pressure to match the end-use can make significant savings. Compressors should not be set to a higher pressure than required. This will also reduce wear and save money on maintenance costs

Are your compressors located correctly?

You can reduce costs by moving your air inlets outside. For every 10°C reduction in inlet temperature, compressor efficiency can be improved by 2.5%. Compressing air produces significant amounts of waste heat. This could be used for space heating in the workshop, further increasing the efficiency of your compressor.

Are you using up-to-date accelerated drying equipment?

When drying equipment is due for replacement, consider newer, cleaner technologies that significantly reduce running costs and improve efficiency:

- infrared (IR) dryers with fast response times; and
- ultraviolet dryers with electrodeless bulbs (higher rate of cure for the same power).

Have you consulted your electricity provider about saving money?

- It is worth comparing the tariffs of electricity supply companies. Figures suggest that this can save up to 20%.
- Your current electricity provider is obliged to advise you of the most favourable tariff for your pattern of use – make sure that you're on it!
- If you are on a maximum demand tariff, improving your power factor can reduce the maximum demand of your installation, which will reduce charges. It will also reduce energy consumption by reducing current in cables and equipment.

Are you managing your electricity use effectively?

- Promote a 'switch-off' culture in your organisation (e.g. make sure employees switch off lights that are not needed and don't leave monitors on unnecessarily).
- Fitting energy efficient bulbs and replacing the motors in suction and compression equipment with high efficiency units can give an energy saving of between 2% and 4%.
- Energy monitoring and targeting will identify specific use and waste.
- Ensure buildings are well insulated.

5.7.6 Environmental legislation

Legal compliance

There are many areas in the printing industry where legislation applies.

Are you disposing of your waste legally?

- Never dispose of waste developer, fixer or associated rinse/wash water into drains, sinks, basins, toilets or onto the land unless you have received consent from the water supply company (foul drains) or your local regulator (surface water drains). If you do have a consent, then the water company will probably insist that any water will have to pass through a silver recovery unit prior to discharge.
- When disposing of cleaning materials contaminated with photochemicals, the resultant waste may be hazardous, depending on the properties of the chemicals used and the level of contamination. Further guidance can be obtained from the Environment Agency.

Are you storing your chemicals properly?

The law states that you must store all flammable liquids, including solvents, in a flammable liquids store to reduce the risk of fire. This will also reduce waste through evaporation.

A substance may be claimed by its manufacturer to be harmless, but this does not guarantee that it is harmless to the environment. If your solvent use is over **200 tonnes/year** or **150kg/hour**, you will be regulated under the Environmental Permitting Regulations Part A(2). If your solvent use is below this, you may still require a Part B permit. Part A(2) and Part B of the Environmental Permitting Regulations are regulated by your local authority. Consequently, by reducing solvent consumption to below these threshold values, certain regulatory requirements can be avoided.

6 Further information

Useful sources of information

WRAP guides and tools

- Saving Money Through Resource Efficiency: Reducing Water Use.
- Tracking Water Use to Cut Costs.
- Reducing Your Water Consumption.
- Resource Efficiency for Managers.
- Environmental Strategic Review Guide.
- Waste Mapping: Your Route to More Profit.
- Workforce Partnerships for Resource Efficiency.
- Green Office: A Guide to Running a More Cost-effective and Environmentally Sustainable Office.
- Self-assessment Review for Food and Drink Manufacturers.
- Resource Efficiency in the Hospitality and Food Service Sector.
- WRAP Waste Hierarchy guide.

Useful links

Regulators:

- **England and Wales**: telephone 03708 506506, or visit www.environment-agency.gov.uk
- **Scotland**: telephone 01786 457700, or visit www.sepa.org.uk
- **Northern Ireland:** telephone 028 9056 9371, or visit www.doeni.gov.uk

- The **Carbon Trust** helps business to cut carbon emissions. Visit the website at www.carbontrust.co.uk for more information or call 0800 085 2005.

- The **Energy Saving Trust** (www.energysavingtrust.org.uk) offers independent and impartial advice about how to save energy and money.

WRAP

WRAP (Waste & Resources Action Programme) works in England, Scotland, Wales and Northern Ireland to help businesses and individuals reap the benefits of reducing waste, develop sustainable products and use resources in an efficient way.

Since its creation WRAP has funded projects that will, over their lifetimes, deliver over 120 million tonnes of waste diverted from landfill and over 20 million tonnes of CO_2 equivalent greenhouse gases saved. Visit www.wrap.org.uk for more information on all of WRAP's services.

What support can you get from WRAP?

UK businesses could save £23 billion per year and help create and protect jobs by improving the way they use resources.

WRAP provides a range of free resource efficiency support for organisations including:

- WRAP Resource Efficiency Helpline on 0808 100 2040;
- online tools and guidance;
- online training initiatives;
- tailored business support for recycling companies;
- case studies; and
- guides.

Visit www.wrap.org.uk to find out more.

We hope that you have found this guide helpful on your route to greater resource efficiency. Don't forget that WRAP is here to help you to improve resource efficiency. Visit the website at www.wrap.org.uk or contact the WRAP Resource Efficiency Helpline on 0808 100 2040.

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April 2012