

ENVIRONMENTAL MANAGEMENT FOR HOTELS

THE INDUSTRY GUIDE TO SUSTAINABLE OPERATION

4 WASTE

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This manual was published in 2014 when Sustainable Hospitality Alliance was known as International Tourism Partnership (ITP), part of Business in the Community (BITC).



On average, a hotel creates around **1kg of waste per guest per night**. The import of manufactured and packaged goods, particularly to smaller, more remote destinations with limited or no recycling facilities, creates significant waste disposal problems

4 WASTE

This section looks at the benefits of reducing, reusing and recycling waste – both to the environment and to your bottom line. It examines the different kinds of waste produced in a hotel, and how you can keep them out of landfill.

4.1 THE ISSUES

Despite a massive increase in recycling rates over recent years, consumer society continues to generate large quantities of waste. Waste tends to be a by-product of a more affluent lifestyle – people in less developed countries do not have the purchasing power to generate waste in the first place, and poverty forces them into reusing as much as they can for other purposes. With the very large populations and rapid economic development we are witnessing in countries such as China and India, it is inevitable that the problem of waste and its disposal will have an increasingly significant effect.



Poorly managed waste can pose a threat to health, the quality of our environment and places a burden on businesses and national economics. As a result, the management and minimisation of waste have moved up the agenda for any efficient commercial operation.

Most of the manufactured items we throw away have involved the use of natural resources (materials, energy and water) and some degree of pollution during their production. Cutting consumption reduces these impacts and cuts down on waste, as well as the time spent handling it. Often it is more resource-efficient to manufacture new products through recycling old ones, as in the case of aluminium cans or glass containers.

As landfill sites are being used up, they are becoming more and more expensive and will represent an ever greater percentage of operating cost in years to come. In the UK for example, the current standard rate of landfill tax for 'active' wastes (those that give off emissions) is GBP24 per tonne (compared with GBP10 per tonne before 2000). This will have doubled to GBP48 per tonne by 2010/11. In some countries it is not possible to landfill waste safely because the geology is unsuitable. Incineration, even with a waste-to-energy plant, can be less efficient than recycling.

4.2 WHY MANAGE WASTE AT YOUR HOTEL?

- a A waste management programme will help you **reduce the amount of waste you produce**, saving materials, resources and energy.
- b **You often pay twice for the waste you produce** – firstly in the form of packaging and secondly to dispose of it.
- c On average, a hotel creates around **1kg of waste per guest per night**. This soon mounts up if you multiply it by the number of guest nights each year, as does the cost to dispose of it.
- d **Your waste disposal costs are likely to increase** steadily due to diminishing landfill capacity and the cost of collections.
- e **Waste legislation** on business and households is becoming **increasingly stringent**, especially in the European Union.
- f **Many items of waste have a value** because they can be recycled into something else. You may be able to make money from your hotel's waste.
- g Often **at least 30 per cent of a hotel's solid waste stream can be sorted for recovery and recycling**. Hotels in the Scandic chain for example sort their waste into up to 22 separate categories!



4.3 WASTE MANAGEMENT – OBJECTIVES

If there is no arrangement for managing waste at your establishment, now is the time to set up a waste management programme. Your objectives should be to, wherever possible:

a REDUCE

The best way to improve waste management is to **create as little waste as possible** by not purchasing it to begin with.

b RECOVER

You need to set up systems to **collect and sort** the waste so that it can be reused or recycled.

c REUSE

Consideration will need to be given to where **certain items can be reused**, or whether they can be sold or donated to organisations outside the hotel that can reuse them.

d RECYCLE

Many hotels, restaurants and tourism establishments already have some system in place for sorting and collecting everyday waste items such as bottles, cans, cardboard and paper for reuse or recycling. Have you considered all the waste you generate and **what else might be recycled?** What happens to your used batteries, plastic bottles, wine corks, bathroom amenities or cooking oil for example?

4.4 WASTE MANAGEMENT – ACTIONS

4.4.1 Calculate your total waste volume and weight

- a** Calculate your total **annual waste volume** by multiplying the volume of your skips by the number of skips of the same capacity and the number of times the skip is removed each year – as shown in **FIGURE 4.1** below.

A	B	C	A × B × C
Volume of skip (litres)	Number of skips of this capacity	Number of times removed each year	Annual volume of waste (litres)
1,280	2	104	266,240
240	1	104	24,960
TOTAL VOLUME OF WASTE (add up the results to estimate waste volume):			291,200

FIGURE 4.1

Calculating waste volume

This example assumes a hotel with a restaurant with two 1,280 litre continental steel containers and one 240 litre domestic waste bin, each removed twice weekly.

SOURCE: WASTE COUNTS: A HANDBOOK FOR ACCOMMODATION OPERATORS. REPRODUCED WITH PERMISSION OF CESHI, DEPARTMENT OF HOSPITALITY, LEISURE & TOURISM MANAGEMENT, OXFORD BROOKES UNIVERSITY



- b Now estimate the **annual weight** of your waste by multiplying the estimate of volume by the factor that best correlates to your hotel type as shown in **FIGURE 4.2**. If the bins are not usually full before they are emptied, this should be factored in. For example, for a three-quarters full bin you need to multiply the total waste volume by 0.75. You should also consider obtaining smaller bins or whether you can reduce the frequency of your collections.

FIGURE 4.2

Estimating waste weight

Type of hotel	Total volume of waste (from Example 1)	Average weight of waste per litre	Total weight of waste (kg) per year
Bed and breakfast		0.079	
Hotel		0.050	
Hotel with restaurant	291,200	0.064	18,637
Pub		0.100	

SOURCE: WASTE COUNTS: A HANDBOOK FOR ACCOMMODATION OPERATORS. REPRODUCED WITH PERMISSION OF CESH, DEPARTMENT OF HOSPITALITY, LEISURE & TOURISM MANAGEMENT, OXFORD BROOKES UNIVERSITY

- c Once you have estimated your total annual waste by weight, you will have a starting figure against which to measure future reductions. Later on you will also be able to work out a benchmark for the amount of waste created per guest night. **SEE 4.4.5**

4.4.2 Identify where waste is created

- a Walk around the hotel and **compile a checklist** (**SEE APPENDIX 1**) to identify where in the hotel building and in its grounds that waste is created and whether it might be reduced, reused, recycled or replaced. It is usually the Food and Beverage and Housekeeping departments that produce the greatest percentage but waste is also generated in public areas, gardens and offices.
- b If you do not already keep a list of any substances you use that are **hazardous** or that need special handling (such as used oils and lubricants, chemicals or pesticides for example), these should now be listed in a separate register. **SEE SECTION 8**
- c Remember that **refurbishment** or **replacing old equipment** also creates waste.

4.4.3 Your action plan

- a Next, look closely within **each department** and list **all the items** you dispose of and **the method of disposal** together with an estimate of the **yearly quantities** involved and the **annual costs**. **SEE FIGURE 4.3 AND APPENDIX 2**
- b For **each item of waste**, ask yourself if you can:
- **REDUCE** the amount used – is it necessary or can you use it more efficiently? Can you persuade your supplier to change their production or packaging process?
 - **REUSE** all or some of it – if so for what purpose? If not, could the specification be changed, for instance by switching to reusable transit packaging?



- **RECYCLE** it – is someone willing to collect or buy the waste? If you are not generating sufficient quantities to make it worthwhile could you link up with other hotels and businesses in the area? Can the waste be sorted and stored on site pending collection?
- **REPLACE** it – If it is non-recyclable, are there alternatives that can be recycled?
- **MORE SAFELY DISPOSE** of the residual waste? Meeting legislation must be the first goal so check the law, especially on the disposal of hazardous wastes, and act promptly.

c Next, **work out what your financial savings will be** from:

- ordering less to start with
- reduced disposal costs
- revenue from the sale of waste materials.

d **Prioritise the plan** into actions that are easy to implement and will bring real benefits.

e Finally, **identify and train staff** to manage the process of sorting and collection. If properly run, a 'no waste' campaign will help to introduce a culture of waste minimisation into the business.

Waste item	Approx. annual quantity	Current disposal route	Current disposal costs	Reuse / recycle?	Action	Cost (USD)	Approx. annual savings (USD)
Glass beverage bottles	20 tonnes	Disposed to landfill	Part of main contract	✓	Switch to returnable where possible Recycle residual bottles	None	1,260
Packaging card	1 tonne	Disposed to landfill	Part of main contract	✓	Ask grocer to take back packaging and where possible purchase reusable packaging for supplier	200	70
Plastic laundry bags	50kg (0.05 tonne)	Disposed to landfill	Main contract	✓	Purchase replacement cotton bags or rattan baskets	300	10
TOTAL	21.05					500	1,340

FIGURE 4.3

Extract from a solid waste audit

1 METRIC TONNE = 0.984 IMPERIAL TONS
SEE SECTION 12.2 FOR FURTHER CONVERSIONS



4.4.4 Non-hazardous waste separation

- a Before embarking on a waste-separation programme, find out which material can be collected by **local waste and recycling contractors**. In countries where recycling programmes and waste management are relatively well advanced, waste may have to be separated into several categories.
- b Try to **implement recycling actions wherever practically possible**. Local conditions may limit what you can do. For example some countries lack the infrastructure for recycling elements of the waste stream such as plastic bottles.
- c Review how you can **eliminate or reduce use**. It is better for your bottom line to minimise the use of items so that you avoid having to separate them into waste streams and paying to dispose of them. For example:
 - Avoid the use of plastic straws.
 - Use containers with lids in preference to plastic wrap, cling film or foil.
 - Use refillable containers for soap, cleaners and foodstuffs.
 - Substitute reusable glass bottles for plastic ones.
 - Use cloth or canvas bags or baskets for laundry, shoe polish, etc. instead of plastic bags.
 - Use mugs in preference to paper cups, and paper cups rather than polystyrene.
 - Maximise the use of computers/electronic mail to reduce paper use. Ask yourself if you really need to print out the document.
 - Make and use your own compost, where feasible.
- d Implement **recycling at source** to make the sorting process more efficient – for example put divided waste bins with compartments for paper, cans and glass in guest rooms. Housekeeping trolleys should have similar compartments so that sorting can be carried out in situ.
- e Look at what can be **reused** in the hotel or by external organisations:
 - **Worn towels, sheets and tablecloths** can be re-used as cleaning cloths and dusters or turned into aprons.
 - Reuse computer and other **paper** as notepaper.
 - **Donate used and surplus items** to schools or charitable organisations instead of throwing them away, such as donating partially-used guest shampoo, conditioner and bath gel to homeless shelters and charities.
 - Reuse leftover **pads and pencils** from meeting rooms.
 - Use straw and shredded paper or other degradable material for **packaging**.
 - Use **cloth napkins** in preference to paper ones. If you do use paper ones, they can be composted after use unless they are badly soiled.
 - For Christmas and other festival decorations use **live, rooted trees** that can be replanted afterwards. If you cannot obtain a tree with roots, chip it for **composting**.
 - Avoid using waste disposal units that grind **kitchen waste** before putting it down the drain. They require a lot of water to work effectively and increase the burden on waste water treatment. They can also cause odours and attract rodents.



4.4.5 Monitoring and benchmarking progress

- a Monitor the results** of both your one-off actions and ongoing efforts. You will need to define key checks that are critical to the success of each action, and how often they need monitoring – perhaps daily or weekly at first, moving to monthly later on.
- b Benchmarking** can help identify opportunities for savings in your hotel and enable you to compare your performance against that of similar hotels. An example of a waste benchmark for a luxury hotel in Europe with reasonable recycling facilities might be between 0.6 and 1.2 kg of waste per guest per night. [SEE FIGURE 4.4](#)

To calculate simple **waste benchmarks**:

1. Calculate the volume (litres) or weight (kg) of non-hazardous waste sent to landfill over the last full calendar year.^[1] You can find this information on your waste disposal bills, from your waste contractor, or you may need to conduct your own survey ([SEE 4.4.1](#)). Exclude any materials that are separated on-site and recycled but include wastes that are not segregated on site but are recycled by a contractor at a later date.
2. Divide the total volume or weight by the number of guest nights spent at the hotel over the past calendar year.
3. Calculate your potential savings using the equation:

$$\text{YOUR BENCHMARK SCORE} - \text{INDUSTRY BENCHMARK} = \text{POTENTIAL SAVING}$$

Litres or kg per guest night

[FIGURE 4.4](#) shows waste benchmarks for luxury hotels.

Hotel profile	Parameter	Benchmark value for waste produced		
		EXCELLENT	SATISFACTORY	HIGH
Luxury serviced hotels	litres / guest night	< 3.0	< 5.0	< 7.0
	kg / guest night	< 0.6	< 1.2	< 2.0

FIGURE 4.4
Benchmark values for waste production in typical luxury hotels (all climate zones)^[2]

The results fall into three categories: excellent, satisfactory and high as defined here:

EXCELLENT	SATISFACTORY	HIGH
The best that typical hotels could expect to achieve.	The gap between the best that most hotels could expect to achieve and average performance.	The gap between the satisfactory level of performance and high waste production. A figure greater than this is excessive and illustrates poor waste management practices.

See [FIGURE 4.5](#) overleaf for the definition of a luxury hotel.

[1] It is recommended that you measure by weight (kg) for greatest accuracy.

[2] Data sourced from the International Tourism Partnership's environmental benchmarking tool, February 2008.

FIGURE
4.5

The luxury hotel

THE LUXURY HOTEL PROFILE ASSUMES A FOUR OR FIVE STAR FULLY-SERVICED^[3] HOTEL WITH THE FOLLOWING:

- ✓ 150 to 1000 rooms.
- ✓ An average of 55–100m² per room (including public space and back-of-house) with approximately 60 per cent of the total hotel area dedicated to guest bedrooms.
- ✓ Year-round opening, operating at 70 per cent occupancy.
- ✓ 1.2 guests per room.
- ✓ Covers: 2.5 per guest
- ✓ Air-conditioning and heating
- ✓ A laundry producing 6kg/laundry per occupied room (OCRM) per day.
- ✓ A health suite and pool of up to 150m² surface area.
- ✓ Gardens of up to 1,000m².
- ✓ 1 employee per room.

4.4.6 Tips for success

- a Recycling programmes require attention to detail to run successfully. As a rule, the **nearer to the origin** of waste that recovery occurs, **the less sorting and processing** will be needed before the material can be recycled.
- b Ensure that your staff **understand** the reasons for the programme and are motivated. Introduce a ‘no waste’ campaign and provide training for staff throughout the hotel.
- c Regular and clear **communication** is essential to maintaining interest.
- d **Incentivise** staff by allocating the money you save through recycling to a special staff fund. Introduce a prize each month or quarter for the best suggestion on how to reduce waste.
- e Don’t be afraid to seek **advice**. Consultants can help you carry out a waste audit and some only charge a percentage of the money they help you save. Expertise may also be available through your hotel association or local government initiative.
- f Work with your **suppliers** to review and reduce to a safe minimum the amount of packaging used. Consider, at all stages, using returnable and/or reusable (as opposed to disposable) packaging. [SEE SECTION 7](#)
- g **Join forces** with other hotels, restaurants and companies if your waste volume is too small to interest recycling agents or brokers to gain the benefits of scale. Find out if there is a waste minimisation club in your area by contacting your local government authority or hotel association. The internet will help you to track down waste reduction and recycling organisations.

[3] i.e. with premium services and facilities, regarded as a leading hotel in its region.



Using a compactor to crush glass into 'cullet' will save space, reduce the number of vehicle collections and reduce noise at collection times

- h** Don't start sorting and storing until you have identified and appointed a company to recover the sorted material.
- i** Reduce waste volume (e.g. cardboard by using a compactor and glass bottles with a crusher).
- j** Make sure your recycling bins are **clearly labelled** with what can and cannot go in to avoid confusion among staff.
- k** **Cleaner waste products usually obtain higher prices.** Paper rapidly loses its value when mixed with other waste or refuse, and newspapers must be free of other waste products (particularly food or organic waste) in order to be effectively recycled.
- l** **Compost** all your tea bags, coffee grounds, eggshells, raw fruit and vegetable peelings. The process requires and moisture and a variety of material. You can also include (in small quantities at a time) paper serviettes, scrunched up newspaper, grass clippings and leaves. Do not put disease-infected plants, weeds that have gone to seed or grass treated with weed killer into the composter.

4.4.7 Waste types by department/activity

FIGURE 4.6 over the following four pages gives an indication of the kinds of waste typically arising from departments within the hotel and also during refurbishment activities. Some waste items will inevitably be common to more than just one department in the hotel.

FIGURE
4.6

WASTE TYPES BY DEPARTMENT/ACTIVITY

FOOD AND BEVERAGE**Cooking oils**

Cooking oils are either liquid (e.g. refined and unrefined vegetable oils) or solid (e.g. lard, dripping and hydrogenated vegetable oils). Disposal is often not covered by special requirements or regulations although legislation (for example in the UK) demands that all commercial hot food premises be fitted with a mechanism to trap or separate grease, oil and other substances that can block drains. Regular dosing with enzymes can be helpful in breaking down any fats that do find their way down sinks.

Oil and grease can pose a threat to vegetation and wildlife if allowed to enter water courses. Many countries provide a national oil collection network for caterers and restaurants. When cool, collect used cooking oil in a secure container, avoiding contamination with other liquids such as water. It can then be collected by a specialist company for cleaning and blending for use in animal feed, soap or cosmetics production and, increasingly, to make bio-fuels. Austria for example runs a scheme enabling kitchen fat to be collected and turned into bio diesel and biogas energy.

Fats and grease

See cooking oils.

Food waste

Treat the waste off restaurant plates as you would raw fish and meat waste (see below) or arrange for a local pig farmer to collect it (if national legislation permits this practice).

Raw fish and meat bones and trimmings from food preparation

Putrescible items should be bagged securely for collection and disposal by an authorised waste contractor. Check whether there is a commercial scheme in your area to collect food waste for processing into compost or biogas. Alternatively, consider purchasing an 'in vessel' composter which accelerates the composting of mixed food waste (including fish and meat). Such systems can cost less than GBP1 per week to operate and are suitable for hotels. Some establishments use commercial waste disposal units, but there are issues such as the additional energy, water and processing of sewage waste to consider.

Unused bread, pastries, sandwiches, salads etc.

Return to the supplier for recycling or safe disposal or contact your local environmental agency for advice.

Vegetable and fruit peelings, eggshells, used coffee grounds and tea bags

Dry lemon and orange peels for pot-pourri or candy them in sugar for use in baking. Soft fruits from fruit baskets can be used to make jam. Otherwise, all of these items can be composted for use in the hotel's gardens.

Aluminum cans and foil

To make one million tons of aluminium cans from virgin materials requires five million tons of bauxite ore and the energy equivalent of 32 million barrels of crude oil. Recycling them into new cans saves all the bauxite, more than 75 per cent of the energy and avoids approximately 75 per cent of the pollutants.^[4]

The aluminum industry has an established system of collection and reprocessing for used products and it is likely that recycling facilities already exist in your area. Your local authority should be able to advise.

Aluminium foil can be separated from steel cans with magnets, then shredded, delacquered and melted down to make various aluminium products, including cans. Foil that has been used for cooking and that is still relatively clean can also be recycled.

Corks

Natural cork bottle and jar stoppers can be recycled into insulation, tiles and pin boards among other products. Australia, Germany, Belgium and Switzerland have collection schemes. Check whether there is a local scheme on the internet. Even if not, it is worth collecting corks and giving them to staff, schools or local organisations for making into notice boards or other recycled craft products.

Synthetic corks can be recycled into items such as shoe soles and containers and some countries, such as the UK, are beginning to set up recycling facilities.

[4] Source: Worldwatch Institute

Fire extinguishers

Return to the supplier for recycling or safe disposal or contact your local environmental agency for advice.

Fridges and freezers

Refrigeration equipment containing ozone-depleting CFCs or HCFCs is treated as hazardous waste in many countries and is covered by legislation such as the EU's Council Regulation No 2037/2000 on Ozone Depleting Substances (ODS). These substances need to be removed from the equipment before it is scrapped. Your supplier or local environmental authority will be able to advise on the appropriate collection scheme.

Glass

Glass-making is energy intensive – recycling 100 per cent glass cullet saves 20–30 per cent of the energy used to make glass from scratch. The glass used for bottles and jars, tableware and flat glass is soda lime glass, whereas crystal tableware is made of lead glass. Information about recycling facilities for used glass containers should be available from your local authority or the internet. Depending on the end use it may be necessary to sort your waste glass containers by colour prior to collection for recycling. Where there is a market for crushed glass, you should consider using a compactor to crush the glass into 'cullet' before collection. This saves space, cuts down on the number of vehicle collections required and can be quieter if noise is an issue at collection time.

Ensure that light bulbs, crystal drinking glasses, porcelain, ceramics, corks or metal and plastic bottle tops are not put in with glass bottles or jars for recycling as this will spoil the cullet.

Some suppliers operate a deposit refund system for the reuse of beverage bottles. This saves the raw materials and energy used to manufacture new bottles, but it depends upon the transport energy involved in collection and the detergents, water and chemicals required to meet hygiene requirements as to whether there is an overall environmental benefit.

Packaging waste e.g. polystyrene (styrofoam), wooden pallets and cardboard boxes

Work with your supplier to find ways to reduce packaging, reuse or change to reusable or recyclable packaging where possible.

Plastics

Plastics generally divide into two groups: thermoplastics which can be remoulded many times when heated and thermosets which can only be used once. Many plastic bottles and other items display a symbol to show whether they can be recycled.

You should either be able to return unwanted plastic packaging to your supplier or arrange for it to be collected for recycling.

Soft-drink bottles, milk and water jugs and laundry-product bottles, all made of various resins, are sorted and converted into resin pellets. The pellets are then usually melted and moulded into a desired shape. Some of the products made from used resins include drainpipes, plastic bags, non-food containers, lids on non-food containers, insulation, flower pots, clothes pegs, automobile bumpers, rope, carpet backing and household appliances.

Shredded polyethylene terephthalate (PET) bottles can be processed to make fiberfill for quilts, pillows, sleeping bags and coat linings.

Steel cans or 'tins'

Because of the protective tin coating on the steel, these are de-tinned and fed into steel-making furnaces. The steel can be used to make new cans and almost any kind of consumer product, from refrigerators to cars. Tin cans make up only a small proportion of recycled steel – the main sources include old cars, appliances, farm equipment and industrial scrap.

White goods

These include appliances such as washing machines, fridges, freezers and cookers. In many cases your supplier will collect and arrange disposal and if not they should advise what route you should take. Some organisations accept donations of such goods for refurbishment and selling on or for donation to charities or individuals.

CONTINUED OVER...

WASTE TYPES BY DEPARTMENT/ACTIVITY

**GUEST ROOMS AND
GENERAL HOUSEKEEPING****Towels, robes and linens**

Reuse worn or damaged items for cleaning cloths and donate serviceable linens, robes and guest slippers to homeless shelters. Old hotel uniforms can be donated to the local theatre for costumes. Some hotels even turn worn bedcovers into mini blankets and pillows for the hotel's four legged guests!

**Soaps, shampoos and other
bathroom amenities**

Donate to homeless charities, sell to a specialist company for making into candles and other products or switch to the use of dispensers and purchasing in bulk containers.

Cleaning chemicals

Store concentrated or diluted chemical wastes such as bleach temporarily in secure containers in a safe place prior to collection by the supplier or specialist contractor. Never pour them into drains. **SEE SECTION 8.4**

**Pharmaceutical preparations and
medication**

Unfinished medication left behind by guests should be put in a secure cabinet prior to disposal. Some hotels have an arrangement with a charity to collect them for distribution to countries where drugs are not affordable.

Newspapers and magazines

Install segregated bins in guest rooms and fit housekeeping trolleys with separate bins for collecting recyclable paper and other waste.

Televisions and telephones

Several countries operate facilities for recycling waste electronic items and, in Europe for example, these are covered by the Waste Electrical and Electronic (WEEE) Directive which came into force in 2007. **SEE APPENDIX 3**

Batteries

Batteries are either:

- **single use** (such as alkaline manganese or zinc oxide batteries used in personal stereos, torches and clocks; and silver oxide, zinc air, lithium, alkaline or mercuric oxide batteries used for watches, cameras and calculators)
- **rechargeable nickel cadmium (NiCd)**, nickel metal hydride (NiMH), lithium-ion and other technologies which are used for mobile phones, video cameras and power tools.

Use rechargeable or mercury-free batteries wherever possible. However, because they contain heavy metals which can bioaccumulate in plant and animal matter with detrimental effect, collected nickel cadmium batteries are categorised as special waste and must be managed by a certified waste handler. It may be that your supplier will take them back but they must not be put in with general waste going to landfill. There are numerous schemes for collecting and recovering the contents of batteries, particularly NiCd batteries, such as **REBAT** set up by the **British Battery Manufacturers Association** in the UK.

WASTE TYPES BY DEPARTMENT/ACTIVITY

OFFICE**Office equipment
(computers, printers, monitors etc.)**

Part exchange or give back to supplier or donate or sell to local schools, start-up businesses or charities. Some countries operate national electronics recycling initiatives.

Toner cartridges

Contact your supplier or search the internet for information on companies that organise collection for recycling.

Paper and card

Check with the contractor which types of used paper and card they will collect. Fine paper can be cleaned, re-pulped and mixed with varying percentages of virgin pulp and then used in the manufacture of boxboard, tissues, printing and writing paper, newsprint and liner board.

Not all waste paper is recyclable – 'post it' notes, paper coasters, sticky labels etc should not be put in the recycling bin with newspapers and magazines. Some areas run cardboard recycling schemes whereby waste cardboard boxes are shredded for use as animal bedding and then composted.

Reduce use by printing on both sides of paper. Set printers to print out in smaller fonts and edit documents on screen where possible. Send faxes from personal computers rather than a printed copy. Cut up old stationery and make into notepads or give it to a local school.

Engine oils

Do not pour used automobile engine or other equipment oil in the containers for used cooking oils or down the drains. Oils should be collected by a specialist contractor for reprocessing.

Tyres

Tyres contain rubber, fabric and steel wire and beads. As scrap they are bulky, and create a potential fire hazard. Since they contain environmentally toxic substances the disposal of tyres is subject to strict controls in many countries. However, there are many ways in which tyres can be recycled, either by being 'crumbed' to make products such as surfacing for playgrounds or as fuel in high temperature kilns. Contact your local authority for guidance on disposal.

Equipment (lawn-mowers etc.)

Ask your supplier whether they will purchase or take back equipment for disposal or offer it to a local organisation such as the local old people's home, school etc.

WASTE TYPES BY DEPARTMENT/ACTIVITY

GARAGE AND GARDEN

Trimming from hedge pruning

These can be added to your composter (in small batches) unless they are very woody, in which case they can be chipped for use on paths or flower beds.

Garden furniture

Offer for sale to staff, or sell or donate to local organisations.

Wood preservatives

See paints and solvents.

Pesticides

Avoid use of pesticides wherever possible. Store carefully and consult your supplier regarding disposal. **SEE SECTION 8.6**

Lighting

Although using longer-life, energy saving lamps (bulbs) reduces the number that need to be disposed of each year and saves energy, fluorescent tubes and compact fluorescent lamps (CFLs) contain mercury and should not be sent to landfill sites even though in some countries they are not classified as special waste. Some, such as Sweden and the UK, have introduced systems for recycling them into their constituent parts. Contact your local environmental or waste agency for advice. **SEE ALSO SECTION 8.5**

Paints, solvents etc.

Avoid use of solvent-based paints with a high Volatile Organic Compounds (VOC) content as there are now excellent water-based alternatives. Consult your supplier or local authority about the most appropriate methods of disposal and never pour unwanted products into drains. Use small containers for cleaning brushes with solvents. Paint thinners can be reused once the paint in suspension has settled. The reusable thinner can be drawn off the top into a clean container and reused several times before it ceases to be effective.

Asbestos

This constitutes hazardous waste and there are strict regulations in many countries governing how it is handled. Seek specialist advice from a reputable company for removal and disposal. **SEE SECTION 8.7**

WASTE TYPES BY DEPARTMENT/ACTIVITY

REFURBISHMENT

Carpets and other flooring material

Carpets can be reused by other schools, clubs and other organisations (although you need to check first whether it complies with fire regulations) and some carpet manufacturers will take back unwanted carpet for recycling. For all flooring materials it will depend on the material and the method of fixing as to whether it can be reused or recycled.

Furniture

Find out if there are any furniture recycling projects in your area that collect donated reusable items for refurbishment to pass on to low-income households, checking first that upholstered items conform to safety regulations. High quality items can be sold to staff or second-hand companies through auction houses or donated to local charities, schools and small businesses. Your local authority should be able to advise.

Ceramic or stone tiles

Tiles and ceramic bathroom fittings can be crushed and mixed with other materials to make paths or used as aggregate by the construction industry. Contact your local authority for information on possible avenues for disposal.



4.4.8 Terminology and techniques

B**BIODEGRADABLE**

A biodegradable material can be broken down or degraded by micro-organisms in nature. This leads to the release of heat, carbon dioxide, organic residues and methane.

C**COMPACTION**

Waste crushers and compactors can help reduce the cost of transporting waste for recycling or for landfill where this is charged by volume. Some units also bale and lift the compacted waste. When purchasing equipment, look for a high compaction ratio.

COMMINGLED WASTE

This is a term used to describe unsorted recyclable or general waste.

COMPOSTING

Organic matter such as vegetable and fruit peelings, egg shells, used tea and coffee bags, weeds or grass clippings are ideal materials for recycling back into the ground as compost. The greater the variety, the better the compost – too much soft material will become slimy and foul-smelling, while too much tough material can take too long to rot down. Never put raw fish or meat or cooked food waste in your composting bin or anything that will not decompose.

Compost bins can be purchased or made simply from wire mesh and lined with old carpet or cardboard for insulation. Open bins must be covered with carpet or plastic sacks to keep out the rain, positioned away from the building and made rodent-proof. In hot and/or dry climates, it is necessary to moisten the material occasionally with water so that it can decompose. The compost should be ready for use after 6–12 months, when it has turned dark brown and smells sweet and earthy.

A great variety of bins for hygienic, odourless composting are now available, including in-vessel units for mixed food waste, so it is worth researching the market. Some units are designed to be buried in the ground and are able to produce compost in just a few weeks.

CULLET

Crushed glass.

D**DUTY OF CARE**

A requirement that anyone dealing with waste, from production through storage to transportation, must take all reasonable steps to ensure that the waste is handled by licensed contractors and disposal sites and must prevent pollution or harm to anyone as a consequence of waste. In many countries this is enforceable by law and can result in fines.

H**HAZARDOUS OR SPECIAL WASTES**

Wastes which are hazardous to human health or the environment and consequently require special treatment or disposal. They must not be sent to landfill. These wastes include toxic, poisonous, corrosive, explosive, flammable, ecotoxic and infectious materials.

L**LANDFILL**

The process of burying waste in specially constructed pits or landfill sites. In most countries a landfill tax is imposed on waste disposal authorities and groups sending waste to landfill sites.

M**MATERIALS RECOVERY FACILITIES (MRFs)**

These are centralised recycling or reclamation facilities that further process source-separated recyclables or mixed waste (including tin cans, glass and plastics) for selling to materials reprocessors as 'commodity grade' materials.

V**VERMICOMPOSTING OR WORM-COMPOSTING**

A form of composting that uses earthworms (available from angling shops) to convert organic kitchen waste into compost. Compost can be used as a soil conditioner, fertiliser, mulch or as an alternative to peat.

W**WASTE EXCHANGES**

Materials or waste exchanges list different companies' wastes so that they are made available for use by other companies either through purchase or free collection.



4.5

EXAMPLE: SETTING UP A PAPER RECYCLING PROGRAMME

This example of how to set up a white office paper recycling programme provides a useful basis for considering the recycling of other waste streams.

4.5.1 Determining recycling potential

You need to be **regularly generating** recyclable materials, be prepared to develop a **system** to collect, sort, package and transport them, and have a **market** – i.e. a processor interested in collecting (and possibly buying) the material – before you can start.

Although almost all paper is recyclable, most successful programmes concentrate on the recovery of only one or two 'grades' of paper:

- white paper (A4 and other bond, photocopying, ink jet and laser paper for example)
- mixed paper (other kinds of office paper, magazines and newspapers).

High quality white paper is in high demand in Continental Europe and elsewhere and most of the UK's white paper collected by paper brokers is sold to Germany or Holland. It can be used by mills as a virgin pulp substitute, reducing demand for trees throughout the world. Mixed paper is taken to a special facility where it is recycled back into high-grade copier paper, and sold back to consumers.

Market prices tend to be higher for white paper than for mixed paper as mixing grades reduces the value to that of the lowest grade in the mix. Even a few sheets of the lower grade are sufficient to downgrade the entire batch. Brokers may be unwilling to pick up lower grades unless there is a reasonable volume of higher grade.

Most paper brokers insist on a certain quantity before they will collect, so you will need to have space to store it between pick-ups. Some will collect unseparated white and mixed paper but there is usually a charge so it is better to separate it at source. If your hotel is too small to run a paper recycling programme on its own, you might consider forming a joint venture with neighbouring hotels and businesses.

4.5.2 Estimating quantities

A conventional hotel office generates about **14 kg of waste paper per employee per month**, and around one third of this (4.6 kg) is high grade recyclable paper that can be conveniently recovered. Studies have shown that a staff participation rate of around 65 per cent is normal, so you should multiply the maximum available quantity by $(65 \div 100)$ to get a more realistic figure.

If this indicates a quantity of paper worth recycling, you should then carry out a more comprehensive waste review. **APPENDIX 4** includes a sample waste paper record form to help you design your own.

4.5.3 Appointing a recycling co-ordinator

The recycling co-ordinator needs to have some **organisational** and **management skills** and experience and, in particular, strong in-hotel communication skills. He or she needs to be brought into the planning process as early as possible so they have ownership of the venture.



4.5.4 Designing the recovery system

Hotels vary in their configuration and in the ways they operate, so it is unlikely that any one paper-recovery system will work for every location. Usually the paper broker can advise on the best system and will provide the containers you need:

- a **Focus** on high-volume, high-value paper generation.
- b **Store** the paper waste at a central point, from which the broker can conveniently collect it. Usually this is at the hotel loading or receiving bay. There must be sufficient space to store containers between pick-ups, and access to the containers must be clear and safe. Ensure that the area does not present a fire hazard. Space must also be available for a compactor/baler, if required.
- c There are two basic **methods of separation and collection**:
 - **Source separation** where storage containers are provided in office areas (particularly where computer printers or photocopiers are located). Each is marked with a description of the type of paper to be placed in it so that staff can separate their paper before discarding it into the special containers. These containers are then emptied by cleaners or other designated employees and the recyclable paper transferred to the central collection point.
 - **Contract separation** which places the onus on cleaners (staff or contract) to separate recyclable paper from the other waste. Using carts equipped with two waste compartments, cleaning staff pick through each waste basket as they empty it, placing recyclable paper in one compartment and rubbish in the other. As the bags are filled, they can be transported to the storage area.

You will need to discuss any proposed programme in advance with the housekeeping department, night cleaners and employees who will be expected to participate. The more convenient the system is for them, the greater the level of success.

It is essential to follow fire and other safety regulations. This means ensuring protection from fire at the intermediate and final storage points, keeping all aisles and fire routes clear, and providing appropriate equipment for the compacting, lifting and transportation of collected materials.

4.5.5 Justifying the programme benefits and cost

Carry out a **cost/benefit analysis** on whether it will pay you to use a broker. Even if it is not likely to generate sufficient income to justify the effort, it is still better to recycle your paper without being paid for it than to pay for it to go to landfill. In helping to alleviate waste-disposal problems and reducing consumption and pollution, you will have the satisfaction of knowing you have done the right thing.

A sample cost-benefit analysis sheet can be found in **APPENDIX 5** to help you. The analysis includes start-up costs, annual operating costs, annual operating benefits, total net annual benefits, return on investment and the payback period.

4.5.6 Selecting a paper broker

Services vary from broker to broker, but generally speaking, the more that has to be provided by the broker (containers, compactors, balers, etc.), the lower will be the price they pay you for the paper. You will need to **strike a balance** between the broker's services and how complex the system is to operate for your staff. Taking fewer services from the broker will improve the price paid for the paper, but the increase in work for staff may make your recycling programme harder to implement successfully.

Before the broker makes a commitment, they will want to review the quality of your recyclables. The prices paid, the length of agreement and the conditions of the contract all need to be carefully considered.



4.6 MORE INFORMATION

4.6.1 Contacts

1. **Basel Convention**
www.basel.int
2. **British Battery Manufacturers Association**
www.bbma.co.uk
3. **Centre for Environmental Studies in the Hospitality Industry**
www.business.brookes.ac.uk/research/groups/ceshi.asp
4. **Chartered Institution of Wastes Management (CIWM)**
www.ciwm.co.uk
5. **National Centre for Electronics Recycling**
www.electronicrecycling.org
6. **Global Recycling Network**
www.grn.com
7. **Grassroots Recycling Network (GRRN)**
www.grrn.org
8. **Institute of Hospitality**
www.instituteofhospitality.org
9. **International Solid Waste Association**
www.iswa.org/web/guest/home
10. **Portugese Cork Association - Cork recycling**
www.realcork.org/artigo.php?art=31
11. **Recyclingappeal.com**
www.recyclingappeal.com
12. **UK Environment Agency**
www.environment-agency.gov.uk
13. **United Nations Environment Programme (UNEP-DTIE)**
www.unepie.org
14. **US Environmental Protection Agency, Waste**
www.epa.gov/osw
15. **Waste Watch**
www.wastewatch.org.uk
16. **Waste and Resources Action Programme (WRAP)**
www.wrap.org.uk
17. **Worldwatch Institute**
www.worldwatch.org

4.6.2 Resources

1. **Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators**
<http://ec.europa.eu/environment/waste/batteries/index.htm>
2. **EU legislation affecting waste**
http://wasteonline.brix.fatbeehive.com/resources/Wasteguide/mn_legislation_european_euaffected.html
3. **How to make compost**
www.hdra.org.uk
4. **Make it – sell it – recycle it: New rules for the disposal of electrical & electronic equipment**
www.berr.gov.uk/files/file41319.pdf
5. **Netregs**
www.netregs.gov.uk
6. **Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC and 2003/108/EC**
www.netregs.org.uk/library_of_topics/waste/weee.aspx



APPENDIX 1

Hotel waste checklist

You can adapt this form for your own hotel. The purpose is to help evaluate the environmental impact of frequently used products in your hotel and to assist in determining the best method of disposal.

Product used	Reduce	Reuse	Recycle	Replace
Aerosols				
Air conditioner				
Aluminium appliances				
Batteries				
Bedding				
Bleach				
Bleach bottles				
Brochures				
Cans (aluminium)				
Cans (tin)				
Card				
Carpet remnants				
Cleanser				
Clothing				
Computer paper				
Cooking oil				
Corrugated boxes				
Detergent boxes				
Dishes				
Disposable nappies				
Disposable pens				
Dry cleaner				
Electrical equipment (e.g. hairdryers, vacuum cleaners, irons, kitchen equipment etc.)				
Electronic equipment (computers, TVs, mobile phones etc.) (SEE APPENDIX 3)				
Facial tissues				
Fertilisers				
Fine paper				
Food (meat waste)				
Food (non-meat waste)				
Food packaging				
Furniture				
Glass bottles				
Laundry bags				
Leaves/grass clippings				
Light bulbs				
Magazines and books				
Matches				
Mattresses				
Menus				
Metal items				
Mirrors				
Motor oil				
Newspapers				
Office equipment				
Oil (kitchen)				
Oil (engine)				
Oven cleaner				
Packaging				
Paints and solvents				
Paper cups				
Paper towels				
Pencils				
Pens				
Pesticides/herbicides				
Photocopying paper				
Plastic bags				
Plastic bottles				
Plastic buckets				
Plastic shower curtains				
Pots and pans				
Printed matter				
Room booklets				
Shampoo				
Shoe bags				
Stationery				
Styrofoam				
Tissue paper				
Toxic and hazardous materials (SEE SECTION 8)				
Window envelopes				
Wood				

Sample waste audit table

Hotel Department:



APPENDIX 3

Waste Electrical and Electronic Equipment (WEEE) Directive
2002/96/EC and 2003/108/EC

Whether for reasons of obsolescence, investment in more energy-efficient appliances, refurbishment or simply wanting to offer guests the latest gadgets, hotels dispose of a large amount of waste electrical and electronic items each year. Because of the burden this places on landfill space and the hazardous nature of some of the materials that these products contain, legislation on disposal is becoming increasingly stringent.

For example, **The EU Waste Electrical and Electronic Equipment (WEEE) Directive** is one of a series of 'producer responsibility' Directives that makes EU producers of new equipment pay for the recycling and/or safe treatment and disposal of the products they put on the market when they eventually come to be thrown away.

WHO IS AFFECTED?

The Waste Electrical and Electronic Equipment (WEEE) legislation introduces new responsibilities for businesses and other non-household users of electrical and electronic equipment (EEE). These include businesses (such as hotels), schools, hospitals, and government agencies when they dispose of their electrical waste. These organisations will need to ensure that all separately collected WEEE is treated and recycled. Whether the business or the producer of the EEE pays for this depends on the circumstances.

Any business that manufactures, brands or imports electrical or electronic products is known as a 'producer' and is affected. Businesses using and selling electrical items or storing, treating or dismantling WEEE are affected. Shifting the burden of payment for the treatment, recycling and disposal of WEEE from end-users to producers will have a significant impact on purchasing and disposal arrangements for business users:

- If you bought equipment **before 13 August 2005, and are replacing it** with new equipment fulfilling the same function, then **the producer of the new equipment** is responsible for the collection, treatment and recycling of the old equipment, regardless of whether they were the original manufacturer.
- If you bought the equipment **before 13 August 2005 and do not replace it**, then **you** are responsible for financing and arranging treatment in accordance with the WEEE Regulations and existing waste management legislation, including the Duty of Care and the Hazardous Waste Regulations.
- If you bought electrical equipment **after 13 August 2005**, then the **producer of that equipment** is responsible for its collection, treatment and recycling when you dispose of it.
- If you lease or rent equipment, the producer is usually responsible for its disposal.
- The regulations allow producers and business users to agree '**alternative arrangements**', whereby the business user agrees to take on some or all of the future costs of the end-of-life treatment of the equipment he buys. This is a commercial decision that you will need to make and is likely to form part of the normal negotiating processes for supply contracts in the future.

COLLECTION ARRANGEMENTS

- WEEE from business users may be collected by the obligated producer or the compliance scheme working on its behalf.
- WEEE may either be collected directly from your premises or you may be asked to take the WEEE to a local collection facility (which should be easily accessible to you).

CONTINUED/...



APPENDIX 3

.../continued

ACTIONS TO TAKE

- Think about the environmental consequences before replacing equipment. **Do you really need to buy a new product?** Could you upgrade your existing equipment or could be you buy a refurbished product instead? If you have working equipment that you no longer need, think about passing it on to others instead of throwing it away.
- **Take account of the WEEE Regulations** when entering into commercial negotiations and procurement decisions concerning EEE.
- **If you are buying electrical products** from a distributor or other intermediary, make sure you obtain the **producer registration number** for the equipment being supplied so that you know who to contact to arrange disposal at the end of its life. Suppliers of EEE should always be able to provide this on behalf of producers.
- If the producer is responsible for WEEE disposal, establish whether it is the producer or the producer's compliance scheme who will be arranging for disposal, and whether collection will be from your premises or a local collection facility.
- Be aware of your responsibilities under other waste management legislation, such as the **Duty of Care** and the **Hazardous Waste Regulations**.

MORE INFORMATION

Further information is available from:

Department for Business Enterprise and Regulatory Reform (BERR)
www.berr.gov.uk/sectors/sustainability/weee/page30269.html

Environment Agency
www.environment-agency.gov.uk/weee



APPENDIX 4

Waste paper record

Department where generated	Type of waste paper	Estimated quantity	Temporary storage
Accounting			
Business centre			
Computer			
Engineering			
Executive office			
Front office			
Guest rooms			
Housekeeping			
Kitchen			
Mail Room			
Management Information Systems (MIS)			
Photocopy room			
Sales office			
Stewarding			

TYPES OF PAPER

NOTE: You will need to check with the paper broker as to exactly how they categorise different waste paper types and what is acceptable.

A White paper

White ledger, white bond, white photocopy and laser paper, deposit slips, letter-sized computer paper.

B Mixed paper

Coloured ledger: coloured bond, photocopy paper, cheques, carbonless forms, envelopes, manilla file folders, magazines, newspapers.

CONSOLIDATION

White paper

A

Mixed paper

B

TOTAL A + B

.....



APPENDIX 5

Cost and benefit analysis

START-UP COSTS

Equipment (bins, etc.).....

Promotional materials.....

Additional transportation costs.....

TOTAL..... **A**

ANNUAL OPERATING COSTS

Equipment repair/replacement.....

Additional janitorial expense.....

Co-ordinator's time.....

Promotional materials.....

TOTAL..... **B**

ANNUAL OPERATING BENEFITS

Intangible benefits (list).....

Anticipated revenue.....

Decreased disposal cost.....

TOTAL..... **C**

NET ANNUAL BENEFITS = **C** - **B** = **D**

(Total annual operating benefits **C**
less total annual operating costs **B**)

RETURN ON INVESTMENT = **D** ÷ **A** =

(Total net annual benefits **D**
divided by total start-up costs **A**)

PAYBACK PERIOD = **A** ÷ **D** = YEARS

(Total start-up costs **A** divided by
total net annual benefits **D**)