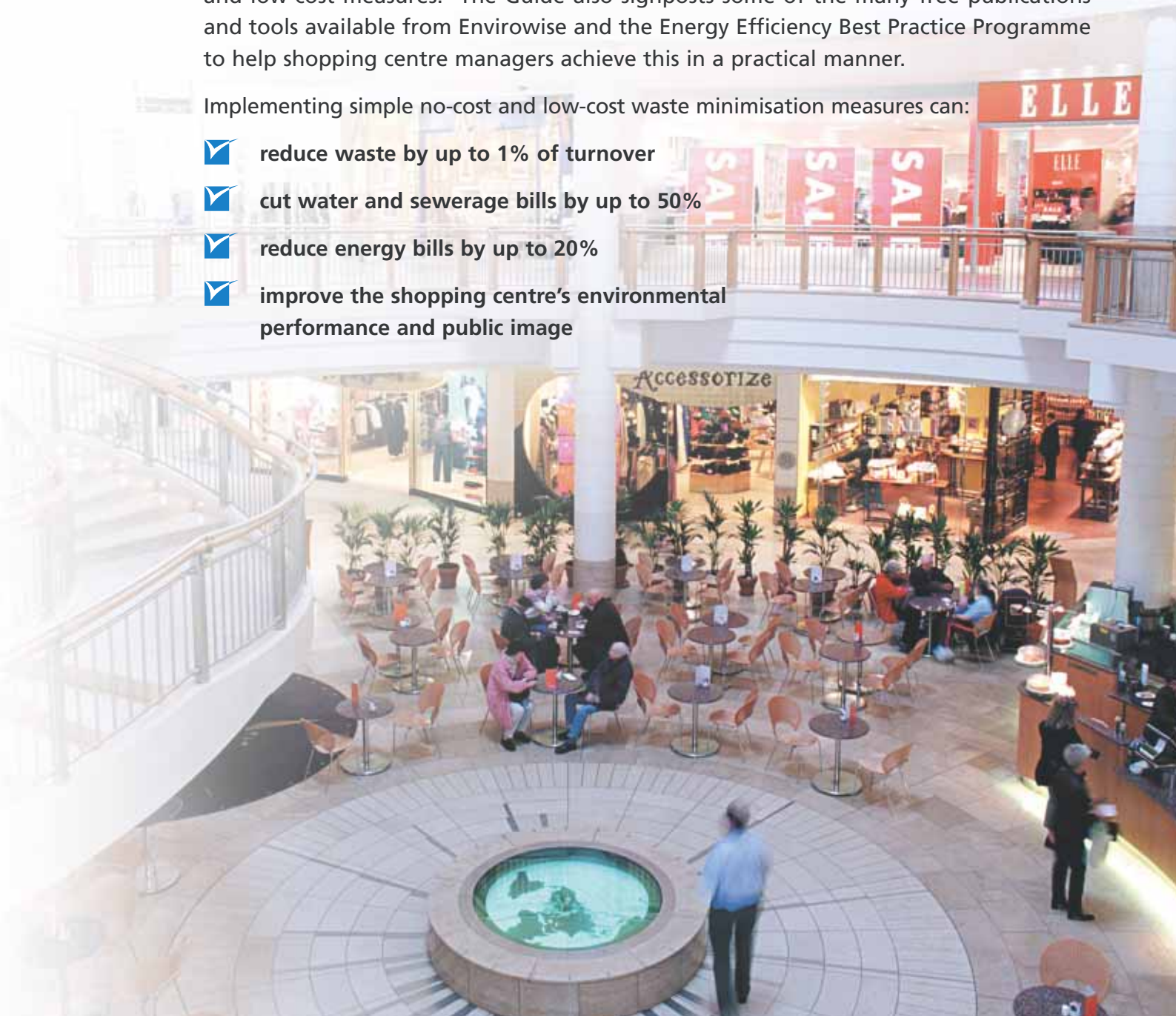


Reducing waste and utility use in managed shopping centres

Waste disposal, water and energy are all operating costs that shopping centre managers can take action to reduce through a systematic approach to waste minimisation. The potential savings to be made are significant. This Guide gives key tips to help shopping centre managers to reduce waste and utility use and increase profits through no-cost and low-cost measures. The Guide also signposts some of the many free publications and tools available from Envirowise and the Energy Efficiency Best Practice Programme to help shopping centre managers achieve this in a practical manner.

Implementing simple no-cost and low-cost waste minimisation measures can:

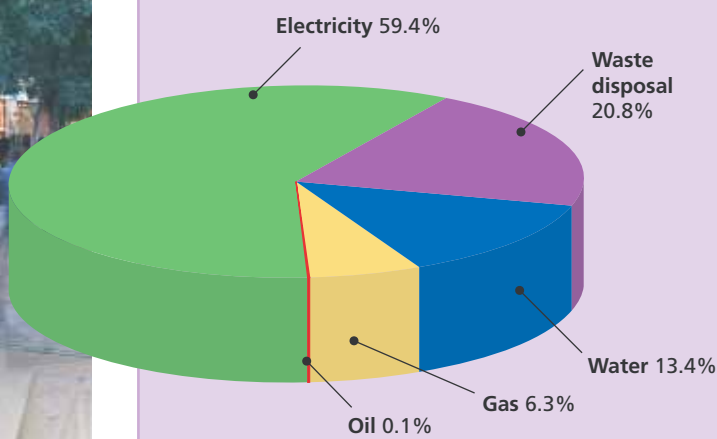
- ✓ reduce waste by up to 1% of turnover
- ✓ cut water and sewerage bills by up to 50%
- ✓ reduce energy bills by up to 20%
- ✓ improve the shopping centre's environmental performance and public image



Waste and utility use

There are some 1 500 shopping centres in the UK occupying around 21 million m² of floor space¹. These shopping centres generate large quantities of waste and consume significant amounts of water and energy each year. A survey carried out for Envirowise during 2001 found that electricity was the highest service cost for shopping centres and retail parks, followed by waste disposal and then water (see Fig 1).

Fig 1 Comparative costs of waste disposal and utilities at shopping centres



Reducing waste disposal, water and energy costs is an easy way to improve profitability in a competitive marketplace. The savings go straight to the bottom line. Taking action to reduce these costs will also improve the shopping centre's environmental performance and thus its reputation with its stakeholders (investors, customers, employees, etc).

This Guide describes the costs of waste disposal, water and energy in shopping centres and provides ideas for no-cost and low-cost ways in which managers of shopping centres and retail parks (both in and out of town) can take action to reduce the costs of:

- waste (see pages 2 - 4);
- water (see pages 4 - 5);
- energy (see pages 6 - 7).

Forms are provided to help you calculate key performance indicators for waste, water and energy in your shopping centre.

Detailed practical advice is available in a range of free publications and tools (see page 7) produced by Envirowise and the Energy Efficiency Best Practice Programme. To obtain your free copies or to discuss which are the most appropriate for your requirements, contact the Environment and Energy Helpline on freephone 0800 585794.

Other services available through the Environment and Energy Helpline include:

- free, confidential advice about how to reduce waste and utility costs;
- free site visits from an independent consultant.



Advice and publications on reducing waste and water costs can also be obtained from the Envirowise web site.

www.envirowise.gov.uk



Advice and publications on reducing energy costs can also be obtained from the Energy Efficiency Best Practice Programme web site.

www.energy-efficiency.gov.uk

Reducing packaging and other solid waste

Why reduce waste?

The cost of waste is typically 4% of turnover - in some companies it can be as high as 10%. Implementing waste minimisation measures can reduce these costs by a quarter - often with little or no investment cost. For a company making a margin of 10% on sales, a 1% reduction in costs equates to a 10% increase in profits.

How much can you save?

What was your turnover last year? £

Divide this figure by 100. £

This is the cost saving you could probably achieve by implementing a systematic waste minimisation programme. The money will go straight to your bottom line.

The retail sector as a whole produces an estimated 12 million tonnes of waste each year at a cost of some £360 million/year. In 2001, the sector had sales of £225 billion - waste minimisation could thus result in cost savings of approximately £2.25 billion/year across the sector as a whole. Although this is an estimate, it indicates there are opportunities to save significant sums of money. Most retail complexes now carry out some activities to reduce waste disposal to landfill, through cardboard recycling etc, but Envirowise studies have found that by reducing waste at source much more could be achieved.

¹ *The Shopping Centre Industry: Its Importance to the UK Economy*. British Council of Shopping Centres, 2001.

Taking action to minimise waste is not only good environmental practice but also good business practice. Reducing material consumption and waste generation while providing the same service reduces both environmental impact and costs - and improves profit margins. Waste disposal costs are expected to increase significantly in the future to accommodate planned increases in the landfill tax and measures to implement the EU landfill directive.

How much waste?

A survey carried out for Envirowise in 2000 found that shopping centres produce an average of 0.03 tonnes of waste per m² of retail floor space. This figure suggests that a total of some 560 000 tonnes of waste were produced in 2000 by UK shopping centres. Annual growth is around 20 800 tonnes/year of waste (3.7% annual growth). The survey found a wide variation in the amount of waste, with some centres producing significantly less waste per m² of floor space. These variations were related to some extent to the types of outlet in the shopping centres. For example, shopping centres with large supermarkets tended to produce more waste due to the faster movement of stock and the associated greater use of packaging.

Calculating your shopping centre's specific waste generation will establish a base-line against which to track improvements and cost savings. Use your

waste bills and Table 1 to help you. Specific waste generation can be measured either as the relationship between the floor space or letting area of your shopping centre and the weight of solid waste generated, or as the weight generated per visitor (footfall).

Reducing packaging waste

Packaging is a key waste stream for shopping centres and one with many opportunities to achieve cost savings and other benefits.

The Envirowise survey found that paper and cardboard account for the majority of waste produced by shopping centres. For example, a 40 unit shopping centre produces about 60 tonnes/month of cardboard waste, a 100 unit centre produces about 120 tonnes/month and a 150 unit centre produces about 250 tonnes/month.

Ways of reducing packaging waste include:

- elimination of unnecessary packaging;
- packaging redesign to reduce weight;
- use of re-usable, multi-trip packaging;
- packaging re-use;
- segregating packaging materials for recovery.



Table 1 Specific waste generation form

Category	Data	Units	
Solid waste landfilled	<input type="text"/>	tonnes/year	
Solid waste recycled	<input type="text"/>	tonnes/year	
Solid waste incinerated	<input type="text"/>	tonnes/year	
Packaging waste disposal	<input type="text"/>	tonnes/year	
Special waste	<input type="text"/>	tonnes/year	
Other waste	<input type="text"/>	tonnes/year	
Total waste	<input type="text"/>	tonnes/year	A
Floor space (letting area)	<input type="text"/>	m ²	B
Footfall	<input type="text"/>	annual number	C
Specific waste generation (floor space)	<input type="text"/>	tonnes/m ²	A/B
Specific waste generation (footfall)	<input type="text"/>	tonnes/visitor	A/C



Improved packaging leads to cost savings in the retail supply chain

Initially launched as a pilot scheme, a partnership approach between a distribution company (Securicor Omega Express), a book publisher (Macmillan Distribution Ltd) and a book retailer (Waterstone's) to design a custom-built, re-usable tote box as a replacement for cardboard cartons has resulted in significant cost and environmental benefits. The benefits of the new tote box, which are spread across the retail supply chain, include:

- elimination of the need for 21 720 cardboard cartons (initial trial saved £7 000/year and 15 tonnes/year of waste);
- an estimated 95% reduction in paper packaging used as in-fill;
- reduced damage to stock during transit;
- reduced cost of compliance with the packaging waste regulations.



Key tips for reducing waste

- Identify key inputs and outputs.
- Look for opportunities to prevent waste from occurring in the first place and then to reduce the amount of waste generated.
- Look for opportunities to re-use and recycle waste.
- Arrange for returns and unsold products to be sent back to suppliers.
- Separate wastes at source (particularly cardboard and polythene) in clearly labelled or colour-coded containers, and send for recycling.
- Re-use packaging materials such as bubble wrap, boxes, pallets and crates for regular deliveries.
- Contact the Environment and Energy Helpline on 0800 585794 for free advice and/or publications or visit the Envirowise web site (www.envirowise.gov.uk).

Reducing water use

Why reduce water consumption?

Water has traditionally been a cheap and plentiful resource for shopping centres, but this situation is changing and mains water costs are increasing. Reducing water use also means that less domestic sewage and trade effluent are produced (sewerage and trade effluent charges are also increasing to meet stricter environmental standards). Energy costs could also be higher than necessary if water is being heated and then wasted.

Minimising the unnecessary use of water is one of the easiest ways of achieving cost savings. Companies that adopt a systematic approach to water reduction typically achieve a 20 - 50% decrease in the amount of water used - and the volume of wastewater generated.

How much water?

A survey of water use in UK shopping centres and retail parks was carried out by Envirowise in 2001. The 29 shopping centres that responded to the survey used a total of 258 147 m³/year of water, at a cost of over £273 500/year. This figure equates to the amount of water used by more than 223 million visitors. The average cost of water for these shopping centres was about £9 500/year, equivalent to 54 pence/m² of letting area or 0.1 pence per visitor. The survey found that most shopping centres were being charged between £1.00/m³ and £1.80/m³ for mains water and its subsequent disposal as domestic sewage; the average was £1.30/m³.

Shopping centres vary considerably in the volume of water used per unit of letting area and per footfall. In the survey, specific water consumption ranged from around 17 litres/m² to 2 000 litres/m², with an average of 500 litres/m². In terms of footfall, this figure ranged from around 0.1 litre/visitor to 10 litres/visitor, with the average of 1 litre/visitor. The large difference in specific water consumption from worst to best case figures could account for thousands of pounds of potential savings every year for shopping centres.

Calculating your shopping centre's specific water consumption will establish a base-line against which to track improvements and cost savings. Use your water bills (or the difference between two meter readings over a period of a month) and Table 2 to help you. Specific water consumption can be measured either as the relationship between the floor space of your shopping centre and the volume of water used, or as the volume used per visitor (footfall).

Table 2 Specific water consumption form

Category	Data	Units
Water consumption	<input type="text"/>	m ³ /year D
Water consumption	<input type="text"/>	litres/year D x 1 000 = E
Floor space (letting area)	<input type="text"/>	m ² B
Footfall	<input type="text"/>	annual number C
Specific water consumption (floor space)	<input type="text"/>	litres/m ² E/B
Specific water consumption (footfall)	<input type="text"/>	litres/visitor E/C

Areas to investigate

The volume of water used in any shopping centre can vary considerably depending on the time of year and how equipment is operated. Potential areas of waste include:

- staff and customer toilets and washrooms;
- surface cleaning;
- vehicle cleaning;
- leaking pipes;
- water tank flushing;
- hoses;
- kitchens and restaurants;
- fire sprinkler systems and hoses;
- water features;
- watering of plants and grassed areas.

The benefits of water meters

Water meters allow you to:

- measure your actual water consumption accurately and thus manage water use better;
- allocate water use between letting and service areas;
- detect serious leaks by highlighting discrepancies between water use calculated from meter readings of incoming water and wastewater (after allowing for losses, eg evaporation from water features).

As a general rule, the more meters at a site, the lower its specific water consumption due to the more effective management of water use and its costs. Could your shopping centre benefit from installing more meters?

Simple water-saving measures

Fitting simple water-saving devices in washrooms and toilets can reduce water use by up to 40%. These include:

- percussion (push) or infrared taps;
- timers;
- flow regulators;
- cistern volume adjusters;
- passive infrared (PIR) detection in urinals.

Key tips for reducing water use

- Install sub-meters to allow greater control of water use.
- Identify key inputs and outputs. Look for opportunities to prevent unnecessary use of water and to reduce the amount of water used.
- Switch off water supply when not needed.
- Check for leaks regularly.
- Fit water-saving devices in toilets and washrooms.
- Contact the Environment and Energy Helpline on **0800 585794** for free advice and/or publications or visit the Envirowise web site (www.envirowise.gov.uk).



Reducing energy consumption

Why reduce energy?

Lighting, heating, ventilation and air-conditioning are the main uses of energy in shopping centres. Lighting accounts for more than two-thirds of the energy used in a typical shopping centre. In addition, all the energy used for lighting is converted into heat and so increases the need for ventilation or cooling.

Energy is a significant operating cost for shopping centres, but simple no-cost and low-cost measures can achieve savings of up to 20%. Energy efficiency measures are an easy way of making your centre more attractive to tenants and increasing profits without having to increase sales.

How much energy?

Calculating your shopping centre's specific energy consumption will establish a base-line against which to track improvements and cost savings. Use your energy bills (or the difference between two meter readings over a period of a month) and Table 3 to help you. For example, department stores typically spend £20.4/m² on electricity and £2.8/m² on fossil fuels but, with good practice, these would fall to £16.9/m² and £1.9/m² respectively².

Simple energy-saving measures

There are many simple no-cost and low-cost ways of reducing energy consumption. Table 4 gives ten ways of achieving immediate savings. Most of these measures will cost nothing and some will reduce your maintenance costs as well.

Table 3 Specific energy consumption form

Category	Data	Units	
Electricity	<input type="text"/>	kWh/year	F
Gas	<input type="text"/>	kWh/year*	
Oil	<input type="text"/>	kWh/year*	
Other fossil fuel	<input type="text"/>	kWh/year*	
Total fossil fuel	<input type="text"/>	kWh/year	G
Floor space (letting area)	<input type="text"/>	m ²	B
Specific energy consumption (electricity)	<input type="text"/>	kWh/m ²	F/B
Specific energy consumption (fossil fuel)	<input type="text"/>	kWh/m ²	G/B

* Ask the Environment and Energy Helpline on 0800 585794 about conversion factors for different fuels.

Table 4 Ten ways to save energy in shopping centres

Energy efficiency measure	Potential savings
Switch off non-essential lighting outside office hours.	10% of lighting costs
Check lighting levels in back-of-house areas.	5% of lighting costs
Replace tungsten lamps with more energy efficient compact fluorescent lamps.	75% of lighting costs
Install photocell controls to switch off lights on bright days and install detectors in infrequently used areas.	20% of lighting costs
Run escalators only during opening hours or use motion-activated escalators.	15% of escalator power costs
Switch off external and car park lights when there is adequate daylight.	60% of outside lighting costs
Operate heating and air conditioning to reflect need.	20% of heating and cooling costs
Reduce the need for air conditioning by opening rooflights and running the ventilation system overnight.	20% of cooling costs
Reduce heating thermostat settings by 1°C.	10% of heating and cooling costs
Avoid operating heating and cooling systems at the same time.	10% of heating costs

² *Business Guide to Energy Costs in Buildings (EMPOCKET)*. Energy Efficiency Best Practice Programme, 1996. Assumes electricity cost of 7.1 pence/kWh and fossil fuel cost of 1.4 pence/kWh.

Cost savings with energy efficient lamps

A 1960s shopping centre was originally lit with 250 tungsten spotlights each with four 100 W lamps, giving a total lighting load of 100 kW. Annual electricity consumption for the lamps was 364 000 kWh. In 1995, the lights were replaced by 40 new fittings with metal halide lamps, each consuming 400 W. The lighting load thus fell to 16 kW/fitting and annual consumption to 58 240 kWh. The project cost £6 000, but electricity costs fell by £15 000/year and maximum demand costs fell by £12 000/year, giving a payback period of less than three months. Maintenance costs have also fallen significantly because the new lamps need replacing less often.

Key tips for improving energy efficiency

- Switch off equipment when it is not needed and ensure thermostats are set correctly.
- Install sub-meters to allow improved energy management.
- Install energy efficient lighting.
- Maintain heating, ventilation and air conditioning systems regularly.
- Consider centralised services.
- Contact the Environment and Energy Helpline on **0800 585794** for free advice and/or publications or visit the web site (www.energy-efficiency.gov.uk).



FREE useful publications

Order your free copies by phoning the Environment and Energy Helpline on freephone 0800 585794. Alternatively, visit www.envirowise.gov.uk to obtain copies of the waste and water publications, and www.energy-efficiency.gov.uk for the energy publications.

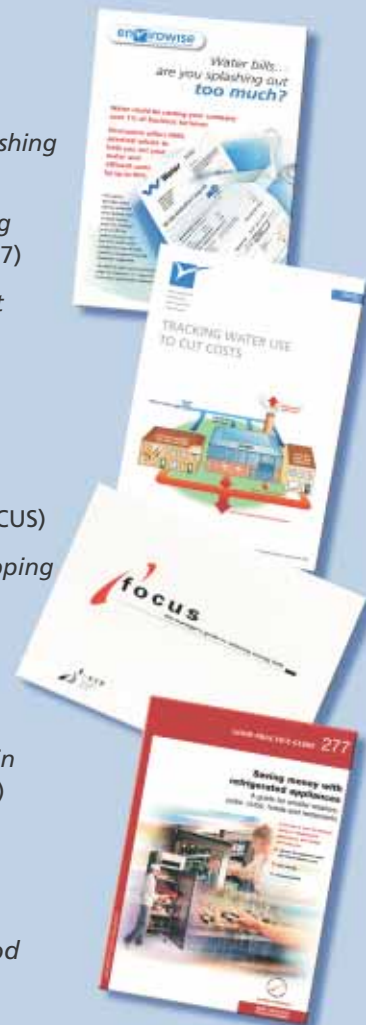
Reducing waste

- *Savings in Store* (EN276)
- *Increasing Profits by Reducing Waste in Managed Shopping Centres* (GG324)
- *Profiting from Waste Reduction in Retail Stores* (GG325)
- *Finding Hidden Profit - 200 Tips for Reducing Waste* (ET30)
- *WasteWise: Increased Profits at your Fingertips* (IT313) - an interactive waste minimisation CD-ROM
- *Cost and Environmental Benefits from Supply Chain Partnerships: Mentor Guide* (GG317)
- *Cost and Environmental Benefits from Supply Chain Partnerships: Supplier Guide* (GG318)
- *Unpack those Hidden Savings - 120 Tips on Reducing Packaging Use and Costs* (ET250)
- *Cutting Costs and Waste by Reducing Packaging Use* (GG140)
- *Choosing and Managing Re-usable Transit Packaging* (GG141)



Reducing water use

- *Water Bills... Are You Splashing Out Too Much?* (EN323)
- *Cost-effective Water Saving Devices and Practices* (GG67)
- *Tracking Water Use to Cut Costs* (GG152)



Reducing energy use

- *The Manager's Guide to Reducing Energy Bills* (FOCUS)
- *Energy Efficiency for Shopping Centres* (GPG134)
- *Introduction to Energy Efficiency in Shops* (EEB003)
- *Energy Efficient Lighting in the Retail Sector* (GPG210)
- *Saving Money with Refrigerated Appliances* (GPG277)
- *Energy Efficiency for Food Retailers* (GPG202)



Action Plan

- ✓ Find out your waste disposal, water and energy costs.
- ✓ Appoint a Champion to co-ordinate your cost-saving efforts.
- ✓ Use the calculator forms (see pages 3, 5 and 6) to work out your specific waste generation, specific water consumption and specific energy consumption. Repeat regularly to track your progress in reducing waste and utility use against this base-line.
- ✓ Record the amount of waste generated by the shopping centre each week.
- ✓ Monitor water and energy consumption. If necessary, install sub-meters.
- ✓ Set budgets and reduction targets for key materials, waste, water and energy. Review regularly and revise as necessary.
- ✓ Identify and evaluate opportunities to reduce waste, water and energy costs.
- ✓ Talk to the owners/operators/managers of individual units about ways of reducing waste, water and energy costs.
- ✓ Develop a reward scheme to encourage suggestions of how to reduce waste and utility use.
- ✓ Eliminate unnecessary packaging and use re-usable packaging where possible.
- ✓ Set up a waste segregation system and arrange for collection of the separate waste streams as appropriate.
- ✓ Implement programmes to recycle cardboard, paper, polythene and other plastic packaging, aluminium cans, metal, etc.
- ✓ Install low-cost water-saving devices in toilets and washrooms.
- ✓ Check regularly for water leaks.
- ✓ Implement an energy management programme.
- ✓ Install energy efficient lighting.
- ✓ Evaluate measures to use energy for lighting, refrigeration, ventilation, heating and cooling more efficiently.
- ✓ Train staff in good practices that reduce waste, water and energy costs. Include relevant issues in induction training and carry out refresher training every year.
- ✓ Maintain refrigeration and air conditioning systems regularly, and specify units and insulation materials with zero ozone depletion potential.
- ✓ Reduce noise nuisance by using quiet vehicles and implementing a delivery code of practice.
- ✓ Plan deliveries to minimise vehicle movements and to maximise loads and back-hauling.
- ✓ Contact the Environment and Energy Helpline on freephone 0800 585794 to:
 - order relevant Envirowise and Energy Efficiency Best Practice Programme publications;
 - seek advice;
 - request a free site visit to help identify cost savings for companies with fewer than 250 employees.

Remember: if you don't measure it, you can't manage it.