

How to Develop a Waste Management and Disposal Strategy



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Introduction

The true cost of waste is not simply the cost of discarded materials - it encompasses inefficient use of raw materials, unnecessary use of energy and water, faulty products, waste disposal of by-products, waste treatment and wasted labour. The actual cost of such waste for UK companies is typically 4 - 5% of turnover, and can be as high as 10% [1].

In 2004 the UK produced about 335 million tonnes of waste (Figure 1). This includes 220 million tonnes of controlled wastes from households, commerce and industry (including construction and demolition wastes). Household wastes represent about 9 per cent of total waste produced in the UK [2]. Therefore there is a significant role for businesses to play in reducing the waste that we produce in the UK.

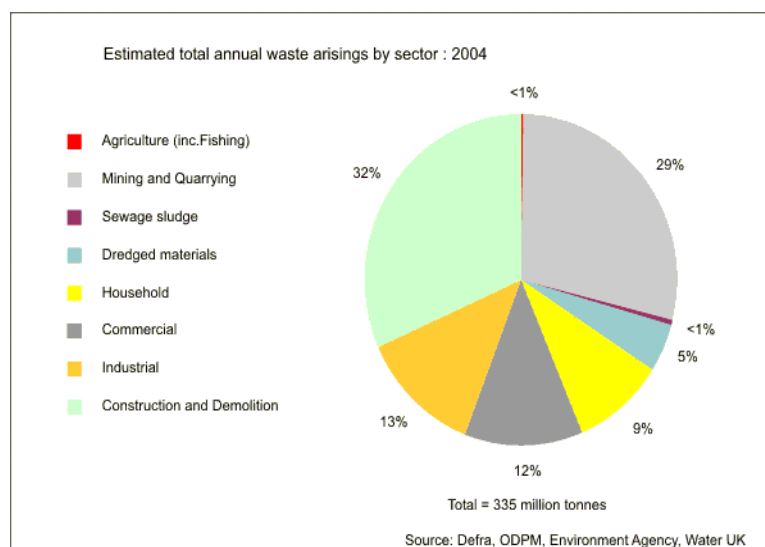


Figure 1: The amount and distribution of waste in 2004 (Source: DEFRA [2])

The European Union suggests that every year 2 billion tonnes of waste are produced in the Member States, and this figure is rising steadily. They suggest that the best solution to this rising mountain of waste is to prevent its initial production, reintroducing it into the product cycle by recycling components where there are ecologically and economically viable methods of doing so [3]. A growing body of national, European and international law now regulates the manner in which wastes are disposed of. These legislative constraints are enforced by social, fiscal and commercial pressures. This environmental legislation is making the reduction and management of waste streams an important issue even for organisations in the supply chain such as wholesalers and retailers, who merely 'pass through' materials that will ultimately become waste.

Waste management has become a complex area, legally, technically and commercially. Very few organisations can still rely on the waste collection services provided through local authori-

ties as a complete answer to their waste management obligations. Thus many firms need to identify and contract one or more reputable, licensed, specialist companies for the disposal of their waste, or discharging their legal obligations.

A key development in waste management is the focus on preventing the production of waste through waste minimisation and the re-use of waste materials through recycling. This links directly to procurement issues, where careful selection of materials, suppliers, process redesign for disassembly and reverse logistics can all reduce the amount of wastes produced or facilitate recycling and re-use.

This booklet focuses on the management of solid wastes and contained liquids in UK businesses. The guidance is also not primarily aimed at local authorities. This booklet is intended for guidance only and as part of a first stage in developing a waste management strategy for your organisation. Please note that the booklet offers guidance based on the current legal position, but this may vary depending on whether your organisation is based in England, Wales, Scotland or Northern Ireland. Readers are directed towards the resources available for them to identify their specific waste management requirements and should confirm their legal obligations with the relevant agencies.

Learning Outcomes

After reading this guidance information it is intended that you:

1. Have an awareness of the broad range of environmental issues that might impact your organisation
2. Have a broad understanding of the key aspects of waste management, especially the waste management options of reduction, reuse, recycling and disposal;
3. Can appreciate the financial and legislative importance of managing wastes in your business;
4. Can identify potential areas within your business that you maybe able to reduce your waste production;
5. Can develop a waste disposal strategy for your organisation; and
6. Are aware of the additional sources of guidance and support that are available to you.

Environmental Topics affecting Businesses

The website NetRegs provides an up-to-date summary on a variety of environmental topics and legislation of interest to UK organisations (Table 1). This list is a useful summary of a range of environmental topics that may affect your organisation.

This booklet deals specifically with waste management but you should:

- examine this list in table 1
- tick (✓) those of specific interest to your organisation; and
- visit NetRegs websites for more details on these topics at <http://www.netregs.gov.uk/netregs/275207/?version=1&lang=e>

Table 1: An overview of environmental issues that may impact your business [4].

<ul style="list-style-type: none">☐ Climate change levy and emissions trading: Guidance on the Climate Change Levy, Climate Change Agreements, UK Emissions Trading Scheme and EU Emissions Trading Scheme.☐ Contaminated land: Guidance on how you can identify contaminated land and who is responsible for cleaning it up.☐ Control of major accident hazards (COMAH): Guidance on legislation that aims to prevent major accidents and limit the consequences of any that do occur.☐ Duty of care - your waste responsibilities: Guidance on the Duty of Care, which applies to all businesses that produce waste.☐ End-of-life vehicles: Guidance for businesses and individuals who produce vehicles, own or operate vehicles or dismantle vehicles.☐ Energy efficiency: Guidance on reducing energy use.☐ Energy labelling and energy efficient design: Guidance on energy efficiency labelling for manufacturers and retailers of electrical appliances.☐ Environmental management systems: Guidance on environmental management systems.☐ Hazardous/special waste: Guidance on the storage, handling and disposal of waste that is hazardous or dangerous.☐ Import and export of waste: Guidance on the shipment of waste across national boundaries.☐ Landfill: Guidance on the Landfill Regulations for waste producers and landfill site owners.☐ Life Cycle Assessment and Integrated Product Policy: Guidance on Life Cycle Assessment, Life Cycle Thinking and Integrated Product Policy.☐ Local Air Pollution Control (LAPC) and Local Air Pollution Prevention and Control (LAPPC): Guidance on the LAPC and LAPPC pollution control regimes, which control emissions to air from industry. Industry is required to use the best available techniques.☐ Nature conservation: Guidance on species, habitat, landscape and built environment conservation - who are the regulators and how can it affect your business?☐ Noise, odour and other nuisances: Guidance on statutory nuisance, including noise, odour, dust, pests and artificial lighting.☐ Oil storage: Guidance on the storage of oil in tanks, intermediate bulk containers, oil drums and mobile bowsters.

- ☐ **Ozone depleting substances:** Guidance on the production, transport, sale, recovery, recycling and destruction of substances that have an adverse impact on the ozone layer.
- ☐ **Packaging:** Guidance on the legislation relating to packaging waste.
- ☐ **Pesticides and biocides:** Guidelines for those who store, supply, advertise, sell or use pesticides, plant protection products or biocidal (pest control) products.
- ☐ **Pollution Prevention and Control permits:** Guidance on the requirements of the Pollution Prevention and Control (PPC), Integrated Pollution Control (IPC) and Local Air Pollution Control (LAPC) regulatory regimes.
- ☐ **Radioactive substances and wastes:** Guidance for keeping and using radioactive materials, and accumulating and disposing of radioactive wastes.
- ☐ **Recycling your business waste:** Guidance on how to recycle your business waste.
- ☐ **Restriction of hazardous substances in electrical and electronic equipment (RoHS):** Guidance on the regulations limiting the amounts of hazardous substances in electrical and electronic equipment.
- ☐ **Smoke, grit and dust pollution:** Guidance on the key requirements of clean air legislation.
- ☐ **Solvent emissions:** Guidance on legal requirements and good practice for using and storing organic solvents.
- ☐ **Trade effluent - discharges to sewers:** NetRegs guidance on the discharge of liquid wastes to public sewers.
- ☐ **Waste carriers, brokers and dealers:** Guidance on the registrations required for certain waste carriers, brokers and dealers by your environmental regulator.
- ☐ **Waste electrical and electronic equipment (WEEE):** Guidance on what to do with your waste electrical and electronic equipment (WEEE)
- ☐ **Waste incineration:** Guidance on the provisions of the Waste Incineration Regulations and other legislation related to the incineration of waste
- ☐ **Waste management licensing:** Guidance on the licences required to deposit, store, treat and dispose of waste.
- ☐ **Waste minimisation:** Guidance on minimising waste by reducing raw material use, making more from less and reducing the volume and hazard of emissions to air, land and water.
- ☐ **Water pollution:** Guidance on the legislation designed to prevent the pollution of surface waters and groundwater
- ☐ **Water use and efficiency:** Guidance for businesses that use, abstract or impound groundwater or surface water and using water more efficiently to save you money.

What are wastes?

Waste is a wide ranging term encompassing most unwanted materials, defined by the Environmental Protection Act 1990. Waste includes any scrap material, effluent or unwanted surplus substance or article that requires disposal because it is broken, worn out, contaminated or otherwise spoiled. [2]. Wastes are *'those substances or objects which fall out of the commercial cycle or chain of utility'* [5] for example glass bottles that are returned or reused in their original form are not waste, whilst glass bottles banked by the public and dispatched for

remoulding are waste 'until they have been recovered' [6].

The Department of the Environment identifies four broad categories of potential waste:

- Worn but functioning substances or objects that are still useable (albeit after repair) for the purpose they were made.
- Substances or objects that can be put to immediate use otherwise than by a specialised waste recovery establishment or undertaking e.g. ash from a power station used as a raw material in building blocks.
- Degenerated substances or objects that can be put to use only by establishments or undertakings specialised in waste recovery. These are always wastes even if transferred for recovery for value e.g. contaminated solvents or scrap. Such substances only cease to be waste when they have been recovered
- Substances or objects which the holder does not want and which he has to pay to have taken away. If substances or objects are consigned to the process of waste collection then they are waste but they may not be where they are fit for use in their present form by another identified person [5].

Thus organisations may dispose of items of considerable residual value, from production scrap materials to redundant plant and equipment, which may fall within the legal definitions of waste and their control regimes.

The Environment Agency is the legal body in England that controls certain types of waste – known as '**controlled wastes**'. These include household, industrial and commercial waste. Other wastes called '**non-controlled**' (agriculture, mines and quarries) are not currently regulated in the same way.

Certain wastes are classified as '**hazardous**' – this is a broad term for a wide range of substances that may have variable levels of risk. For instance, toxic substances that may cause cancer are classed as hazardous. Fluorescent tubes or cathode ray tubes in televisions are also classed as hazardous and pose little immediate threat but may cause long term damage over a period of time [7]. The Environment Agency identifies waste as any substance or object that has been discarded, is required to be discarded or is intended to be discarded. The word 'discarded' has a broad meaning and includes those things that are going to be recycled or recovered.

The framework detailed in Figure 2 gives the reader a general overview of the different types of wastes. (Please note that in some instances agricultural wastes can be considered as controlled wastes.)

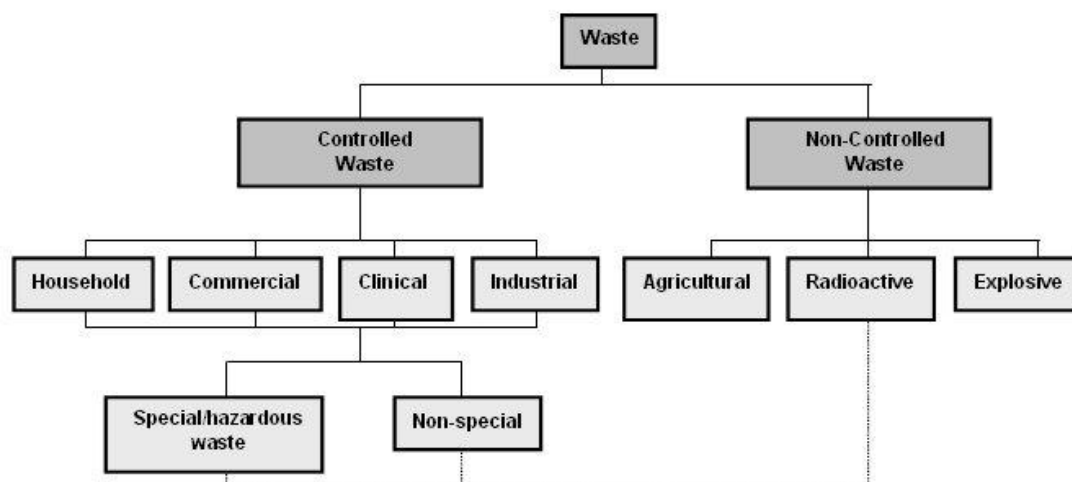


Figure 2: Waste Classification Framework (source: EAUC [8])

Definitions used in waste management information

This document and many of the websites you visit to formulate your waste management strategy will use the terminology detailed in table 1.

Table 2: Definitions of common terms. Source: adapted from [2] and [8]

Agricultural waste	Agricultural waste therefore includes a range of waste streams that originate from agricultural or horticultural establishments, for example, agricultural plastics and packaging waste, empty pesticide containers, clinical waste, tyres, old machinery and oil. Certain wastes, derived from agricultural premises, are subject to strict control under the Animal By-Products Regulations (for example, carcasses and some bedding materials) and/or may be subject to control under Clinical Waste, Special Waste or Radioactive Waste legislation [8]
Civic amenity waste	A sub-group of household waste, normally delivered by the public direct to sites provided by the local authority. Consists generally of bulky items such as beds, cookers and garden waste as well as recyclables.
Clinical waste	Any waste consisting wholly or partly of human or animal tissue, blood or other body fluids, excretions, drugs or other pharmaceutical products, swabs or dressings, or syringes, needles or other sharp instruments, being waste which, unless rendered safe, may prove hazardous to any person coming into contact with it; and any waste arising from medical, nursing, dental, veterinary, pharmaceutical or similar practices, investigation, treatment, care, teaching or research, or the collection of blood for transfusion, being waste which may cause infection to any person coming into contact with it. [8]
Controlled	Household, industrial, commercial and clinical waste that requires a waste management license for treatment, transfer and disposal. The main exempted category

waste	ries comprise mine, quarry and farm wastes. Other legislation and procedures control radioactive and explosive wastes.
Commercial waste	Waste arising from any premises which are used wholly or mainly for trade, business, sport recreation or entertainment, excluding municipal and industrial waste.
Composting	An aerobic, biological process in which organic wastes, such as garden and kitchen waste are converted into a stable granular material which can be applied to land to improve soil structure and enrich the nutrient content of the soil.
Household waste	Includes waste from household collection rounds (waste within Schedule 1 of the Controlled Waste Regulations 1992), waste from services such as street sweeping, bulky waste collection, hazardous household waste collection, litter collections, household clinical waste collection and separate garden waste collection (waste within Schedule 2 of the Controlled Waste Regulations 1992), waste from civic amenity sites and wastes separately collected for recycling or composting through bring/drop off schemes, kerbside schemes and at civic amenity sites.
Industrial waste	Waste from any factory and from any premises occupied by an industry (excluding mines and quarries).
Landfill sites	Any areas of land in which waste is deposited.
Municipal waste	This includes household waste and any other wastes collected by a Waste Collection Authority, or its agents, such as municipal parks and gardens waste, beach cleansing waste, commercial or industrial waste and waste resulting from the clearance of fly-tipped materials.
Radioactive waste	Radioactive waste is defined in the Radioactive Substances Act 1993 as any waste which: consists wholly or partly of substance which would otherwise be classified as a radioactive material (these are listed in Schedule 1 of the Act with associated threshold values); or any substance contaminated by a radioactive material or radioactive waste. It should be noted that some radioactive waste may also be classified as hazardous/special waste.
Recycling	Involves the reprocessing of wastes, either into the same product or a different one. Many non-hazardous industrial wastes such as paper, glass, cardboard, plastics and scrap metals can be recycled. Special wastes such as solvents can also be recycled by specialist companies, or by in-house equipment.
Special / Hazardous waste	<p>Special Waste is defined by the Control of Pollution (Special Wastes) Regulations 1980 as any controlled waste that contains any of the substances listed in Schedule 1 to the regulations, or is dangerous to life, or has a combustion flashpoint of 21°C or less, or is a medical product as defined by the Medicines Act 1968 [2]</p> <p>Special/Hazardous Wastes are controlled waste that, because of their properties, requires special treatment and control. There is no easy definition of special/hazardous waste as account needs to be taken of the properties of each substance which may or may not be a function of its concentration. The Hazardous</p>

Waste Directive contains a list of substances considered to be hazardous. In the European Waste Catalogue, hazardous wastes are marked with an asterisk. In England and Wales the term 'Special Waste' has been replaced by 'Hazardous Waste'. In Scotland 'Special Waste' and 'Hazardous Waste' now mean the same thing and are termed Special Waste. [8]

Treatment	Involves the chemical or biological processing of certain types of waste for the purpose of rendering them harmless, reducing volumes before landfilling, or re-cycling certain wastes.
Unitary Authority (UA)	A local authority which has the responsibilities of both waste collection and waste disposal authorities.
Waste Collection Authority	WCA- A local authority charged with the collection of waste from each household in its area on a regular basis. Can also collect, if requested, commercial and industrial wastes from the private sector.
Waste Disposal Authority	WDA- A local authority charged with providing disposal sites to which it directs the Waste Collection Authorities for the disposal of their controlled wastes, and for providing Civic Amenity facilities.

Managing waste - Reduce, Reuse, Recycle or Dispose?

'every substance extracted from the earth's crust, or harvested from the forest, a fishery, from agriculture is a potential waste...it soon becomes an actual waste in almost all cases with a delay of a few weeks to a few years at most..... materials consumed by the economic industrial system do not disappear .. they are merely transformed to less useful forms'[9]

WasteWatch estimates that for each tonne of household waste, five tonnes of waste are produced in manufacturing and 20 tonnes in the raw materials extraction phase. The Environment Agency estimated that 90% of all resources we consume are either thrown away as 'waste' or discarded into the environment as effluent or air emissions [10]. The focus on resources consumed is an important element in the drive for eco-efficiency. Therefore there has been a move towards viewing waste as not only the traditional municipal and controlled wastes, but also as resources that can be recycled, recovered or reused.

The priority in which wastes should be managed is detailed in the waste hierarchy (Figure 3) as explored in most waste management publications and promoted in the UK waste management strategy.

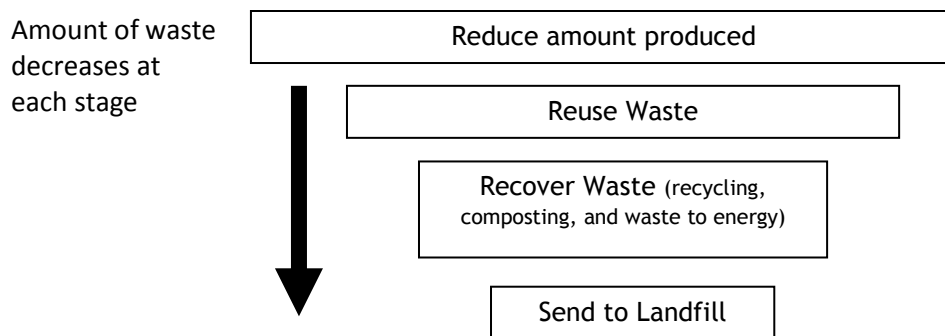


Figure 3: The Waste Management Hierarchy

This hierarchy stresses the need to firstly reduce the amount of waste created, then re-use wastes, then recover (via recycling, composting or waste-to-energy facilities) and finally, as a last resort to dispose of waste to landfill.

The most successful way to manage waste is not to produce it in the first place and this is the driving force behind the idea of **waste minimisation**.

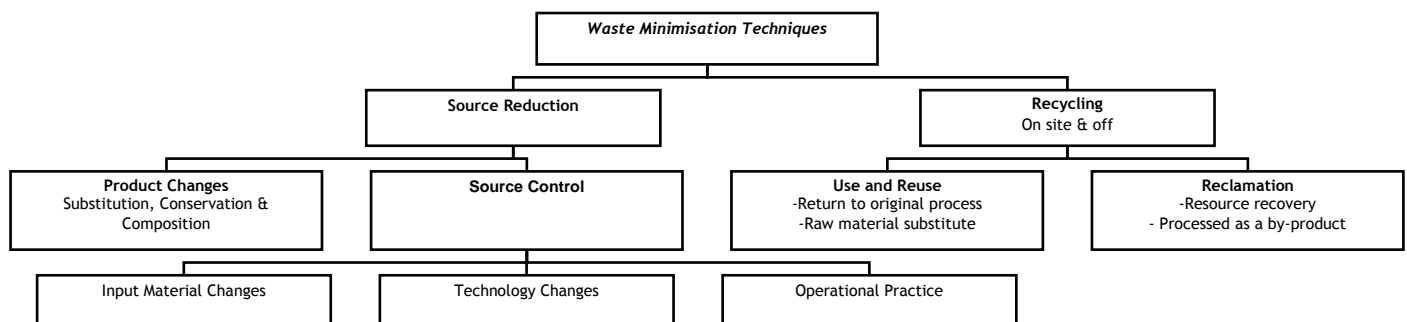


Figure 4: Waste Minimisation Techniques [11]

Materials that are re-used are recovered and then used again in their original form and thus require a controlled process of recovery where contamination and damage can be minimised. An important element of a reuse strategy must be design for disassembly and therefore eco-design of products takes centre stage, along with the recovery procedure.

The return of products to the original manufacturer '**product takeback**' to be disassembled is an important element of reverse logistics. Examples of this include the takeback of Kodak's disposable camera; Canon's toner cartridges and Xerox's photocopy machines [12]

Another example of recycling is that of '**waste exchange**' where the firm producing the waste, who would normally have to pay to have it disposed of, sells or gives it away to another organisation, which subsequently uses it in their own production processes.

Waste management, minimisation, energy efficiency, source reduction and waste exchange can be grouped under the heading of 'eco-efficiency'. Eco-efficiency is a catch-all term that appears to have been adopted to express the application of the 'produce more from less' or 'use less resources to produce the same amount' philosophies. The UK Government's Advisory Committee for Business and the Environment state that eco-efficiency (along with environmental management systems and standards) are a necessary requirement in achieving 'sustainable consumption' [13].

A wide range of support materials have been produced to help organisations to understand and manage their wastes. This booklet draws upon many of these and readers are urged to view these resources directly and to contact the specific agencies that are in place to support you. A list of these are presented in Appendix 1 and 2

- Look at the list of useful documents in Appendix 1.
- Order and download those of specific interest to your organisation

Selected Waste Management Legislation that may affect your organisation

The Duty of Care

The keeper of any waste material owes a duty of care, which means they are required to take 'all reasonable steps' to keep waste safe while it is under their control. If they give waste to somebody else, they are required to assure themselves that the recipients are authorised to transport, recycle, and/or dispose of this waste safely. This duty of care applies to anybody who produces or imports, keeps or stores, transports, treats, recycles or disposes of waste, and it also applies to brokers or other 'middlemen' involved in arranging these activities. If you are a householder and passing your waste on to someone other than the local refuse collection services you are also now bound by duty of care. You can check who is authorised by contacting the Environment Agency [14].

Understand your Duty of Care by examining the free summary leaflet produced by DEFRA available at:
<http://www.defra.gov.uk/environment/waste/legislation/pdf/dutyofcare-summary.pdf>

You can purchase detailed practical guidance on Duty of Care from The Stationary Office by calling 0870 600 5522 – *Waste Management, The Duty of Care, A code of Practice* (ISBN 0-11-753210-X)

The European Waste Catalogue (EWC)

The European Waste Catalogue (EWC) is a hierarchical list of waste descriptions established by Commission Decision 2000/532/EC. The EWC classifies waste materials and categorises them according to what they are and how they were produced [15]. The descriptions and codes within the EWC are a suitable part of the description of your waste so as to comply with your duty of care [8].

The EWC is referred to in a number of EU Directives and Commission Decisions regarding waste management. The UK and other member states are fulfilling their requirement to integrate the catalogue into their domestic legislation. One example of this in the UK is the requirement to make a reference to a EWC code on all Duty of Care Transfer Notes [15].

Visit The European Waste catalogue and look at the types of wastes included
http://europa.eu.int/eur-lex/en/consleg/pdf/2000/en_2000D0532_do_001.pdf

The Waste Electrical and Electronic Equipment Regulations 2006 ("the WEEE Regulations") implement the majority of the provisions of the European Parliament and Council Directive on Waste Electrical and Electronic Equipment ("the WEEE Directive") and the subsequent European Parliament and Council Directive that amended the WEEE Directive [16].

The broad aim of the WEEE Directive is to address the environmental impacts of electrical and electronic equipment when it reaches the end of its life and to encourage its separate collection, subsequent treatment, re-use, recovery, recycling and environmentally sound disposal. The WEEE Directive is a wide-ranging piece of European environmental legislation. It is one of a small number of European Directives which implement the principle of "extended producer responsibility". Under this principle, producers are required to take financial responsibility for the environmental impact of products they place on the market, especially when those products become waste. The WEEE Directive applies this principle in relation to electrical and electronic equipment (EEE) [16].

The WEEE Regulations apply to businesses that manufacture, import, re-brand, distribute, sell, store, treat, dismantle, recycle, dispose, and use electrical and electronic equipment (EEE). There are no exemptions for SMEs under the WEEE Directive, and hence the WEEE Regulations apply to all businesses regardless of size.

The WEEE Regulations came into force in January 2007 and aim to reduce the amount of this type of waste going to landfill, and increase its recovery and recycling rates. There are requirements associated with separate collection, disposal and recycling; standards for its treatment at authorised facilities; and collection, recycling and recovery targets. Producers must have joined a compliance scheme by 15 March 2007 and to mark electrical and electronic equipment (EEE) by 1 April 2007. Full responsibility for treating and recycling household WEEE began on 1 July 2007 [16]

Does this affect my organisation?

If you use, manufacture, import, re-brand, distribute, sell, store, treat, dismantle, recycle, or dispose of electrical and electronic equipment (EEE) then the WEEE legislation potentially affects your organisation

Examine the detailed guidance on the WEEE regulations by downloading the free Guidance notes
<http://www.dti.gov.uk/innovation/sustainability/weee/page30269.html>

Packaging Directive - The Producer Responsibility Obligations (Packaging Waste) Regulations 2005

NetRegs indicates that around 10 million tonnes of packaging waste is produced in the UK each year and most of this is disposed of in landfill sites. The European Commission has set targets for member states to recover and recycle packaging waste. By 31 December 2008, at least 60% of the UK's packaging waste must be recovered, and 55-80% must be recycled [17, 18].

If your business handles more than 50 tonnes of packaging in a year and has a turnover of more than £2 million, you must comply with the Producer Responsibility Obligations. These obligations require you to:

- register with your environmental regulator; and
- recycle and recover certain amounts of packaging waste.

If your business produces packed products, or places packaging or packaged goods on the market, you must comply with the Essential Requirements Regulations. These regulations require you to:

- minimise the packaging used;
- ensure packaging can be reused or recycled ; and
- ensure packaging does not contain high levels of certain heavy metals.

How do I comply?

You need to: register with your environmental regulator, and show that you have met your recycling and recovery targets. You can choose one of the following methods to comply. Whichever method you choose, you must keep records for at least four years to prove compliance [18].

1. Compliance Schemes- You may join a registered compliance scheme, which carries out your obligations for you.

2. Individual Route- You may calculate your own recycling and recovery requirements, and register individually with your environmental regulator.

3. Small producers- If you are a small producer (ie a business handling more than 50 tonnes of packaging per year, and with a turnover between £2 million and £5 million), you may wish to follow the allocation method. You will not have to determine how much packaging you handle, and your obligations depend on your turnover.

Download and read *The Producer Responsibility Obligations (Packaging Waste) Regulations 2005* Summary Leaflet available from DEFRA from <http://www.defra.gov.uk/environment/waste/topics/packaging/pdf/packagewaste06.pdf>

Decide on your method of compliance if these Regulations affect your organisation

Landfill Directive

The Landfill Directive has been progressively implemented since 2001. Most recent changes include:

- More biodegradable household waste is being diverted from landfill
- You cannot dispose of hazardous and non-hazardous waste together
- Hazardous waste must meet strict conditions before it is landfilled
- Liquid wastes are banned from landfill*
- Waste must be treated before it can be landfilled*.

*applies to non-hazardous waste from October 30 2007 [19].

- The co-disposal of hazardous waste and non-hazardous waste in landfill sites has been banned since July 2004. You must now dispose of each type of hazardous waste at a landfill site that is authorised to accept it: if the licence or permit allows it, if certain waste acceptance criteria (WAC) can be met and if the landfill operator is prepared to accept it.

- Your hazardous waste must be pre-treated before it can be landfilled. The treatment should take into account the limit values set by the landfill site's WAC. If after treatment the limit values of the landfill's WAC are exceeded, you will need to treat the waste further before it will be accepted for disposal at landfill. The Environment Agency has published detailed guidance on landfill acceptance requirements and problematic waste streams [19].

The **Landfill Tax** is a surcharge paid by businesses and local authorities on waste disposed of using a landfill site. This tax is paid on top of normal landfill charges at two rates:

- lower rate - £2 per tonne for inactive waste such as rocks and soil (increasing to £2.50 per tonne from April 2008).
- standard rate - £24 per tonne in the 2007/08 tax year, and increasing by £8 per tonne each year from April 2008 until at least 2010/11 [20].

The **Landfill Tax Credit Scheme** (LTCS) encourages and enables landfill operators (LOs) to support a wide range of environmental projects by giving them a 90 per cent tax credit against their donations to Environmental Bodies (EBs). These donations are capped at 6.0 per cent of the LO's landfill tax liability [21].

Future legislation

You should examine the NetRegs site on a regular basis but also keep an eye on publications such as DEFRA's free magazine - *Energy, Resource, Environmental and Sustainable Management*. Trade publications often flag up issues of future concern for their members and this is a good way to prepare for what may be on the horizon. There are two future directives that are examined here: the EU Batteries Directive and the Industry and Water Framework Directive

EU Batteries Directive - who does it affect?

The proposal will affect manufacturers and importers of batteries and businesses that sell batteries and accumulators in the EU as a single unit or within an item that requires a battery to form part of all of its function (eg. a car or computer). If you fall into one of these groups,

you will have new responsibilities to finance the recovery, treatment and disposal of batteries at the end of their life. It will also affect third parties involved in collecting, treating and recycling of batteries as well as businesses who throw away waste batteries, some of which are classified as hazardous waste. The public will also benefit from greater access to recycling facilities [22]

Industry and the Water Framework Directive

The Water Framework Directive will have implications for all sectors whose business activities directly or indirectly affect the water environment. These include the water industry, agriculture, the development and construction industry and all businesses that have discharge consents, trade effluent licences or abstraction licences. The Water Framework Directive will also be relevant to those local authorities, other agencies (particularly the Environment Agency, British Waterways, Natural England and the Countryside Council for Wales) and environment groups with a role in the management of the water environment [23].

Register for your free copy of Energy, Resource, Environmental and Sustainable Management from DEFRA

Quantifying and classifying the waste streams

Before deciding how to deal with wastes, let alone contract for waste management services, it is essential to identify and wherever possible quantify the types of waste arising. Typically, these will differ greatly in their economic consequences, their preferred disposal routes, their potential for waste reduction, recycling or re-use, and hence the requirements placed on a contractor or partner. From this initial view it will be possible to develop individual strategies to reduce the amount of waste generated in each category and to arrange to keep waste streams separated where appropriate, to minimise the costs/maximise the returns on the disposal of uncontaminated wastes and to be free to determine the most appropriate disposal route in each case.

Each operation will differ, but some general categories would include:

General refuse – such as the contents of office litter bins. Advantage can be taken of many small-scale or local recovery/recycling programmes: for example, many vending machine operators will recover polystyrene cups; there are schemes (through suppliers or via charities) to recover and re-use printer cartridges. Where possible use should be made of these but this may require the active commitment of staff.

Paper and paper products. All organisations produce large amounts of scrap paper, which can be recycled. It is also possible to encourage the use of 'both sides of the paper', to cut usage. Paper for recycling must be kept clean and dry; it can pose a fire hazard so consideration needs to be given to safety; and different prices are available for different grades: offcuts from an in-house print plant, for example, may need to be kept separate from the daily newspapers. Again, the degree to which this is possible depends on staff attitudes and the space available.

Production scrap. Most firms generating significant amounts of scrap and offcut materials in metal, plastic, will already have arrangements for collection and recycling. Clearly

there are always possibilities for improving production methods to reduce the volume of scrap generated; but there are also advantages, as in other categories, in keeping scrap clean, dry, and unmixed.

Building/construction waste. Disposal of this will usually be the responsibility of the contractor. However, attention needs to be given to the possibility of hazards (especially asbestos), opportunities for recovery (such as door panels, floor boards, fireplaces which all may have some value) and the possibility of reusing materials such as rubble as hard-core elsewhere on site.

Special wastes. Every operation generates some waste that could be classed as special. Admittedly, someone throwing a half-used bottle of Tippex, or a dead battery, into the general waste stream is unlikely to attract the attention of the Environment Agency, but as a matter of principle firms should attempt to recover as much of this as possible and treat it as Special Waste. Conversely, it is important not to let people dump general waste into Special Waste containers - hospitals, for example, have been found to be paying well over the odds for the controlled high temperature incineration of clinical waste when a substantial proportion of the waste has in fact been coffee cups and newspapers.

There may be other categories. The important point is to identify what types of waste you are generating, discover ways of reducing the volumes (and particularly tonnages - merely keeping wastes dry may have a significant impact on tonnage-based charges) and as far as possible keep waste streams destined for different disposal routes separate.

Developing a Waste Management Strategy

A very good starting point is to use one of the Envirowise publications that have process flow sheets, manuals and training material to facilitate in the development of your waste management strategy. You can choose one that is generic such as *GG414 Measuring to manage: the key to reducing waste costs* or one that is sector specific such as *GG377 Resource efficiency: cut costs in plastics processing* (which also contains CD software to assist you.)

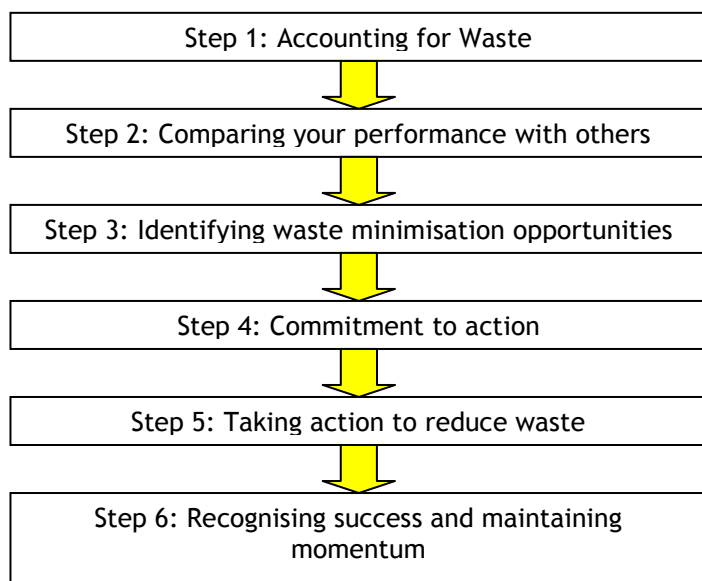


Figure 5: The 6 steps to reducing waste costs (Envirowise GG414)

This next section examines each of these 6 stages and is based on the material presented in the Envirowise publication GG414 'Measuring to manage: the key to reducing waste costs' [1]

Step 1: Accounting for waste

The initial step is to identify how much waste your company is generating and the costs involved

- Order the Envirowise video - *A Fresh Pair of Eyes: Identifying Waste Minimisation Opportunities* (V217).
- Order *WasteWise - Increased Profits at Your Fingertips* (IT313), which is an interactive waste minimisation CD-ROM from Envirowise about reducing waste to save money.
- Undertake a simple walk around waste audit – looking at each key area and identifying what wastes exist
- Examine your utility and other receipts to estimate the costs of waste

There is also a free one day Fast Track visit where an advisor from Envirowise will visit to help you get started

A similar facility is often available from your local 'green' business club – look at your local telephone directory or contact your local Business Link for details

Step 2: Comparing your performance

Use industry guides (such as the Benchmarking guides from Envirowise), trade association guidance and best practice examples to compare your performance with others in your sector. Look at the environmental reports published by others in your sector (many are on-line at www.corporateregister.com).

Step 3: Identify Waste Minimisation Opportunities

Walk around the site looking for areas where waste is being generated and talk to key personnel, especially those who operate each stage of the process. From this practical information, develop a rough plan of ideas to take to senior management

Order the following Envirowise Publications:

- Cutting Costs by Reducing Waste: A self-help guide for growing businesses (GG38C).
- Waste Mapping: Your route to more profit (ET219)
- Waste Minimisation Interactive Tools (WMIT) (IT96)

Step 4: Commitment to Action

When you have made your rough plan, you are ready to present your case to senior management. Convince them of the potential cost benefits of reducing waste and obtain their commitment to providing the necessary resources for implementing a waste minimisation

Action Plan. Start building a team and holding brainstorming sessions with staff to generate ideas for ways to improve performance and competitiveness.

Order the following Envirowise publications:

- Waste Minimisation Pays: Five business reasons for reducing waste (GG125).
- Saving Money through Waste Minimisation: Teams and Champions (GG27)

Step 5: Taking action to reduce waste

Take your rough plan and turn it into an Action Plan. Start by identifying obvious areas of waste reduction where immediate and substantial savings can be achieved by implementing no-cost and low-cost measures

Order the following Envirowise Publications:

- Finding Hidden Profit - 200 Tips for Reducing Waste (ET30);
- Cutting Costs by Reducing Waste: A self-help guide for growing businesses (GG38C)

Also look for sector specific guides on particular themes, e.g. water, packaging, solvents, or specific concerns of your industry. Use meters to obtain accurate data and ensure that they are checked regularly. Implement good housekeeping measures, including a checklist, for every area

Step 6: Recognising Success and Maintaining Momentum

Return to your original assessment and consider your achievements. Feed these back to staff and senior management. You now have the basis for continuous improvement and can review your progress at regular intervals.

Top 10 Tips for Managing your wastes and Developing your waste strategy

1. Understand the legal implications of the waste produced in your organisation by identifying the specific legislation that affects you
2. Look at your general environmental issues – what role does waste play in these?
3. Quantify and identify your waste. Where does it arise and how much does it cost? Undertake a walk around audit and look at your bills. Using the waste hierarchy identify what currently happens to the waste as it arises
4. Identify a waste management champion or team to drive things forward
5. Produce an action plan for reducing your wastes
6. Get commitment from senior management for the action plan
7. Identify the possible disposal options where you cannot reduce or recycle
8. Select your waste carriers carefully and make sure your Duty of Care responsibilities are met
9. Monitor and review your achievements
10. Communicate your successes to your staff, senior managers and outside your organisation to interested stakeholders

CIPS Positions

1. CIPS recognises that waste management strategy starts with, and has to be integral to developing the specification, evaluation and purchasing decision.
2. CIPS recognises that managing waste is an increasingly high priority activity at a global, European, national and local level to achieving sustainable development goals.
3. CIPS recognises that good sustained management of waste adds value to the total procurement process.
4. CIPS acknowledges that waste is generated in most supply chain activity and that people working in supply chains seek to eliminate waste.
5. CIPS encourages purchasing and supply management professionals to work with suppliers to design out waste, especially at the design stage; for example, improving quality assurance to minimise the quantity of faulty products produced, or to reduce unnecessary packaging.
6. CIPS recognises there are legal and social requirements concerning the generation, storage and disposal of waste. Non adherence can have a negative reputational impact, and, in the private sector, impact shareholder value.
7. CIPS recognises that waste management related legislation within the European Union will increasingly impact those working in the purchasing and supply chain profession – a sound knowledge of this legislation is required.
8. CIPS is of the opinion that purchasing and supply management professionals should develop their expertise to manage waste (or work closely with suitable third parties), to meet all legal requirements as a minimum, within upstream and downstream elements of the supply chain, wherever they are/operate within the world. They should aspire to develop innovative solutions for future challenges and opportunities in managing waste. .
9. CIPS encourages purchasing and supply management professionals to proactively work with colleagues in the organisation to address the opportunities and challenges generated in managing waste.
10. CIPS encourages the use of tools such as the Waste Management Hierarchy to promote the strategic and integrated management of waste and reduce the amount of landfill, by reducing consumption, reusing products and recycling.

Conclusion

Waste management is crucial to reducing your organisations impact upon the environment. It is also a fundamental requirement in achieving efficient cost savings and a better financial return for your business.

This guidance note is designed to provide an overview of some of the main areas you may consider when developing your own waste management strategy and to identify sources of detailed support and guidance. Every organisation is different and therefore one guidance note cannot answer every question for all. However the support agencies presented in this document such as Envirowise, NetRegs, DEFRA and many others have invested significantly in resources that you can access that answer questions focused on your individual requirements.

It should be noted that this document draws extensively upon the materials such agencies

provide freely online and in hard copy and readers should look at these original sources.

It is clear that the political and legal environment is placing increasing importance upon managing wastes. The national targets for waste reduction, the increasing costs of disposal, the decrease in landfill space and the focus on producer responsibility seen in the end of life legislation for WEEE, all suggest that companies should be pro-active in developing a waste management strategy that can address current and upcoming environmental issues.

Purchasing and supplying management professionals have a major role to play in reducing the amount of wastes that we produce. From asking suppliers to reduce their packaging, through to design for disassembly and re-use, CIPS members face the challenge of considering the issue of how their purchasing decisions can affect the materials that would historically have been consigned to the waste stream.

References

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- [4] <http://www.netregs.gov.uk/netregs/275207/?version=1&lang=e> accessed 10/5/07
- [5] HMSO (1994) Circular 11/94 Department of the Environment HMSO pp. 41-42).
- [6] EIB (1995) What is waste? Environmental Information Bulletin August 1995 p15-16
- [7] <http://www.environment-agency.gov.uk/subjects/waste/1031954/?> accessed on 1/5/07
- [8] Environmental Association for Universities and Colleges Waste Management Guide <http://www.eaucwasteguide.org.uk/> accessed 20/5/07
- [9] Ayres, R.U and L.W. Ayres, (1996) Industrial ecology - towards closing the materials cycle Cheltenham: Edward Elgar p.1
- [10] Waste Watch (1998) Waste Today An Overview of waste management in the UK. WasteWatch: London
- [11] EPA (1988) Waste Minimisation Opportunity Assessment Manual. United States Environmental Protection Agency, Hazardous Waste Engineering Research Laboratory, Cincinnati EPA/625/7-88/003
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- [13] ACBE (1998) Eighth Progress Report to and Response from the Deputy Prime Minister and the Secretary of State for Trade and Industry, Advisory Committee for Business and the Environment, HMSO, London
- [14] <http://www.defra.gov.uk/environment/waste/legislation/pdf/dutyofcare-summary.pdf>
- [15] accessed 20/5/07 http://www.environment-agency.gov.uk/business/1745440/444663/landfill/1693182/355572/?version=1&lang=_e
- [16] WEEE Guidance Notes <http://www.dti.gov.uk/files/file37923.pdf> accessed 21/5/07
- [17] accessed 18/5/07 <http://www.defra.gov.uk/environment/waste/topics/packaging/pdf/packagewaste06.pdf>
- [18] http://www.netregs.gov.uk/netregs/275207/275453/1427998/1428051/?lang=_e accessed 21/5/07
- [19] <http://www.netregs.gov.uk/netregs/275207/276386/925078/1507154/> accessed 21/5/07
- [20] accessed 21/5/07 <http://www.businesslink.gov.uk/bdotg/action/detail?type=RESOURCES&itemId=1074404201>
- [21] <http://www.ltc.org.uk/howitworks/default.asp> accessed 21/5/07
- [22] accessed 21/5/07 <http://www.environment-agency.gov.uk/business/1745440/444663/1751005/>

[23] accessed 21/5/07 http://www.environment-agency.gov.uk/business/1745440/444663/955573/1622216/1662857/?version=1&lang=_e

[24] accessed 5/5/07

http://www.netregs.gov.uk/netregs/legislation/287972/652894/658423/?version=1&lang=_e

[25] accessed 20/5/07 <http://europa.eu/scadplus/leg/en/s15002.htm>

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Defra e-digest environmental statistics website:
<http://www.defra.gov.uk/environment/statistics/>

Appendix 1: Check list for ordering additional support material

Publications to download for reference

Title	viewed
Duty of Care summary leaflet http://www.defra.gov.uk/environment/waste/legislation/pdf/dutyofcare-summary.pdf	
Guidance : Hazardous Waste : Interpretation of the definition and classification of hazardous waste (Second Edition) This document provides technical guidance for classifying hazardous waste. The document is intended to be a reference document for all legislation where reference is made to hazardous waste and its management, and provides guidance in the assessment of waste to all involved in the production, management, and control of hazardous waste. Available from http://www.sepa.org.uk/guidance/waste/hazardous/index.htm	
WEEE Regulations Examine the detailed guidance on the WEEE regulations by downloading the free Guidance notes http://www.dti.gov.uk/files/file37923.pdf	
Environmental Tax Obligations and Breaks – from Business Link http://www.businesslink.gov.uk/bdotg/action/layer?topicId=1074403838	
Energy, Resource, Environmental and Sustainable Management – Register for your free magazine at www.eaem.co.uk	
Treatment of non hazardous wastes- guidance document on the Landfill Directive requirement to treat non-hazardous wastes being sent to landfill. Available from Environment Agency at http://publications.environment-agency.gov.uk/pdf/GEHO0207BLWJ-e-e.pdf?lang=_e	
Environment Agency issues guidance on forthcoming changes under Landfill Directive http://www.environment-agency.gov.uk/news/1695221?version=1&lang=_e	
The Producer Responsibility Obligations (packaging Waste) Regulations 2005 Summary Leaflet available from DEFRA http://www.defra.gov.uk/environment/waste/topics/packaging/pdf/packagewaste06.pdf	
The European Waste Catalogue http://europa.eu.int/eur-lex/en/consleg/pdf/2000/en_2000D0532_do_001.pdf	

Selected Publications to order from Envirowise

Title	Ordered	Received
EN504 Introduction to the waste hierarchy		
EN505 Re-use waste and improve your bottom line		
EN507 Waste management advice for the commercial sector		
EN508 Getting the most from your waste management contractor		
EN509 No-cost and low-cost waste initiatives for businesses		
ET219 Waste Mapping: Your route to more profit		
ET250 Unpack those hidden savings: 120 tips on reducing packaging use and costs		

ET30 Finding Hidden Profit - 200 Tips for Reducing Waste

GG106 Cutting costs by reducing wastes: running a workshop to stimulate action

GG125 Waste Minimisation- Five business reasons for reducing waste: everything you need to present your case

GG125 Waste Minimisation Pays: Five business reasons for reducing waste

GG25 Saving money through waste minimisation: raw materials use

GG27 Saving Money through Waste Minimisation: Teams and Champions

GG377 Resource efficiency: cut costs in plastics processing

GG38C Cutting costs by reducing wastes a self-help guide for growing businesses

GG414 Measuring to manage: the key to reducing waste costs

IT96 Waste Minimisation Interactive Tools (WMIT)

Free from <http://www.wetbpp.gov.uk>

Notes – Other documents to acquire

Title	Location	Ordered
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Appendix 2: Further Information, Guidance and Support

National/International Agencies

The Environment Agency (England and Wales) - <http://www.environment-agency.gov.uk/>.

Scottish Environment Protection Agency <http://www.sepa.org.uk/>

Northern Ireland <http://www.ehsni.gov.uk/index.htm>

European legislation

Information on Environmental legislation in Member States is available from the Europa website at http://europa.eu/pol/env/index_en.htm

Useful Websites

Action Sustainability – BREW is funding the Sustainable Supply Chain Group SSCG plans to build capacity in sustainable procurement, working with key businesses to embed recommendations of the Sustainable Procurement National Action Plan into their strategies and within their supply chains. <http://www.actionsustainability.com/>

Business Resource Efficiency & Waste programme (BREW) Developed by DEFRA the programme uses funding from the Landfill Tax, to encourage and support resource efficiency. <http://www.defra.gov.uk/environment/waste/brew/>

Business Reuse Fund – The Royal Society of Wildlife Trusts is managing a competitive fund to support applications from community sector groups working with business waste. <http://www.rswt.org/waste>

Carbon Trust - can help your business cut carbon emissions and capture the commercial potential of low carbon technologies. Contact the Carbon Trust via their helpline on 0800 085 2005 or email info@thecarbontrust.co.uk. <http://www.thecarbontrust.co.uk>

Department For Environment, Food & Rural Affairs (DEFRA)-created to drive forward the Government's programmes on the environment, food and rural affairs. They work for the essentials of life - food, air, land, water, people, animals and plants. Their remit is the pursuit of sustainable development - weaving together economic, social and environmental concerns. <http://www.defra.gov.uk/>

DTI Technology Programme - This DTI-led programme can help your business fulfil its potential for innovation. It provides grants for research and development into resource efficiency and for knowledge transfer networks. You can find more details on research calls and findings on their website. The DTI is now the UK Department for Business, Enterprise and Regulatory Reform (DBERR). <http://www.dti.gov.uk/innovation>

EAUC Waste Management Guide - A useful online guide from the Environmental Association for Universities and Colleges on managing waste, Also suitable for other types of organisations, especially service industries and for general guidance for all sectors <http://www.eaucwasteguide.org.uk/>

Environmental Data Information Exchange A valuable (and free) service is the headlines and summaries, with links to full articles, of environmental developments including waste

management issues in the UK, EU, US and elsewhere www.edie.net

Envirowise - offers your business free government-funded, independent, confidential advice and support on practical ways to increase profits, minimise waste and reduce environmental impact. They have a dedicated, free helpline, on-site visits delivered by a nationwide team of expert advisors, Information resources from case studies to best practice guides, Over 200 events a year, from intimate seminars to major exhibitions, and an informative website. Find out how Envirowise can help your business through their helpline on 0800 585 794, or <http://www.envirowise.gov.uk>.

Her Majesty's Stationery Office - HMSO delivers a wide range of services to the public, information industry and government relating to access and re-use of government information. <http://www.opsi.gov.uk/>

Industry Council for Electronic Equipment Recycling (ICER) - a cross-industry association focusing on waste electrical and electronic equipment <http://www.icer.org.uk/index.htm>

letsrecycle.com - independent dedicated website for businesses, local authorities and community groups involved in recycling and waste management. Online service delivers news and material prices plus key information for the business sector ranging from suppliers of plant, equipment, vehicles and services through to job vacancies, careers advice and tenders. <http://www.letsrecycle.com/index.jsp>

Market Transformation Programme (MTP) supports the development and implementation of UK Government policy on sustainable products. In particular, MTP underpins the product policy aspect of the framework for Sustainable Consumption and Production. MTP reduces the environmental impact of products across the product life cycle by: Collecting information; Building evidence; and Working with industry and other stakeholders. You can contact MTP on 0845 600 8951 or by email to info@mtprog.com. Visit their website at <http://www.mtprog.com/Index.aspx>

National Industrial Symbiosis Programme (NISP) – Part funded by DEFRA's BREW programme NISP may be able to help you use your waste materials as an input material for another industry or supply you with someone else's waste to use in your manufacturing processes. For more information and case studies see their website or email any questions to info@nisp.org.uk or tel: 0121 766 4560. <http://www.nisp.org.uk/>

NetRegs provides free environmental guidance for small businesses in the UK. We will help you to understand what you need to do to comply with environmental legislation and protect the environment. <http://www.netregs.gov.uk/netregs/>

Waste Matters - provided as part of the Business Resource Efficiency & Waste programme (BREW) to help and encourage BREW partners and stakeholders to share information and advice and debate current issues in waste enforcement. <http://www.wastematters.org.uk/>

WRAP - the Waste and Resources Action Programme. Funded by government to promote resource efficiency, the Waste Resources Action Programme's (WRAP) particular focus is on creating stable and efficient markets for recycled materials and products and removing the barriers to waste minimisation, re-use and recycling. <http://www.wrap.org.uk/>

Institutes and Associations

The Chartered Institution of Wastes Management (CIWM), is the professional body which represents over 6,000 waste management professionals - predominantly in the UK but also overseas. The CIWM sets the professional standards for individuals working in the waste management industry and has various grades of membership determined by education, qualification and experience. <http://www.iwm.co.uk/pm/1>

The Environmental Services Association is the UK's trade association for companies providing waste and secondary resource management and associated environmental services. <http://www.esauk.org/>

Sanitary Medical Disposal Services is a Trade Association for the sanitary, medical and clinical wastes' management industry <http://www.smdsa.com/>

The International Solid Waste Association (ISWA) - is an international, independent and non-profit making association, working in the public interest to promote and develop sustainable waste management worldwide. ISWA has members around the world and is the only worldwide association promoting sustainable and professional waste management. <http://www.iswa.org>

Building Research Establishment -Provide a complete range of consultancy, testing and commissioned research services covering all aspects of the built environment, and associated industries <http://www.bre.co.uk/>

Journals and Trade Publications

The ENDS Report is a subscription based monthly journal for environmental policy and business in the UK. It offers analytical coverage of the latest legislative developments, scientific research, official reports and environmental initiatives driving change and innovation in the public and private sectors. <http://www.endsreport.com/index.cfm>

Energy, Resource, Environmental and Sustainable Management - A free magazine available from DEFRA. www.eaem.co.uk

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