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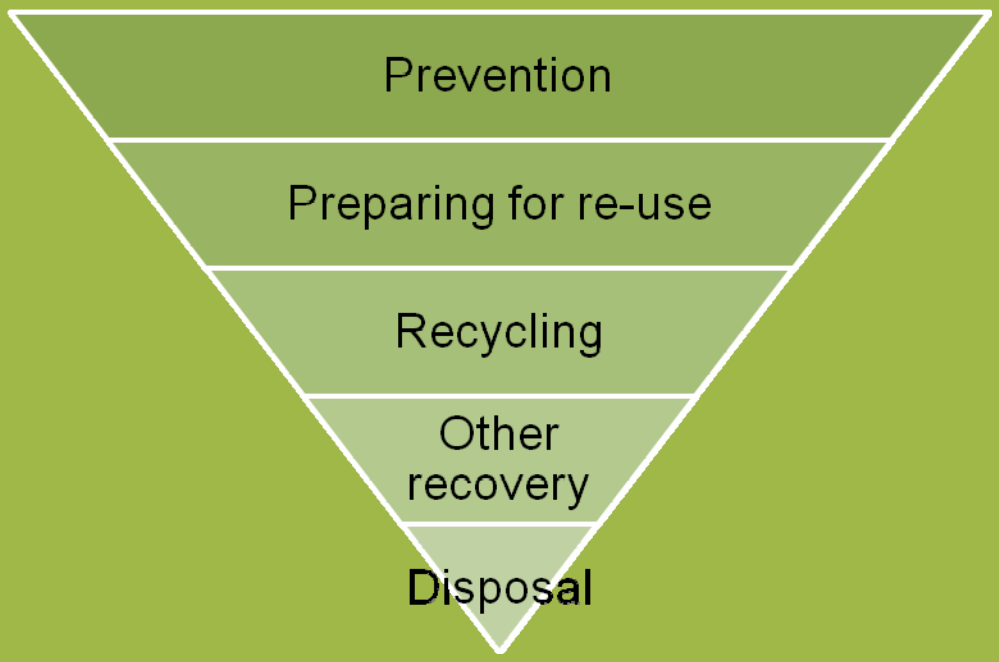
Guidance on applying the Waste Hierarchy



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defra
Department for Environment Food and Rural Affairs

This guidance is produced under regulation 15(1) of the Waste (England and Wales) Regulations 2011 and any person subject to the regulation 12 duty must have regard to it.

The Waste (England and Wales) Regulations 2011 came into force on 29 March 2011. The regulation 12 duty comes into force six months after this date.

Any enquiries regarding this document/publication should be sent to us at:

c/o Waste Hierarchy Guidance
Producer Responsibility Unit
Area 6D Ergon House
c/o 17 Smith Square
London SW1P 3JR

Or email it to *wfdu@defra.gsi.gov.uk* (with 'Waste Hierarchy Guidance' in the subject line, please).

What is this document and who should read it?

This guidance is for any business or public body which generates, handles or treats waste.

It sets out:

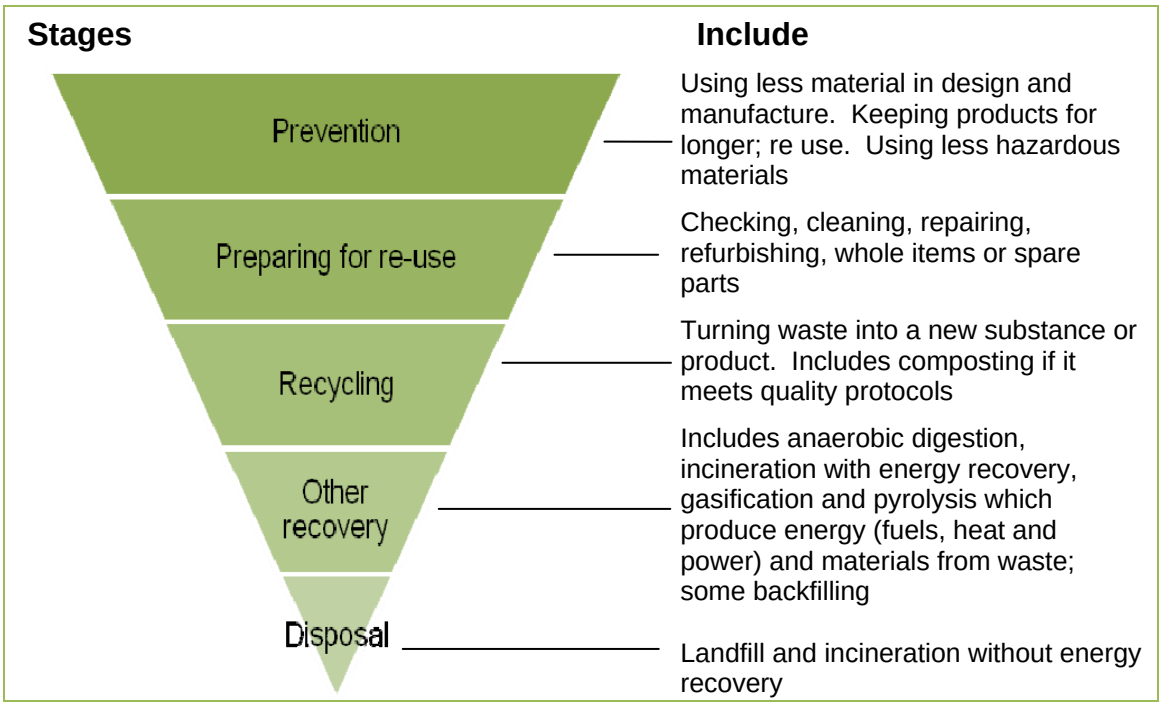
- what the waste hierarchy is (Section 1);
- how it works for a range of common materials and products (Section 2);
- what businesses and public bodies need to do (Section 3)
- key questions and ideas for dealing with waste in line with the hierarchy (Section 4).

The application of the hierarchy to ***hazardous waste*** will be set out in separate guidance to underpin the Strategy for Hazardous Waste Management in England. This guidance is being developed in close liaison with the hazardous waste sector and the Environment Agency.

Section 1 –The Waste Hierarchy

1.1 The *"waste hierarchy"* ranks waste management options according to what is best for the environment.

It gives top priority to preventing waste in the first place. When waste is created, it gives priority to preparing it for re-use, then recycling, then recovery, and last of all disposal (e.g. landfill).



ⓘ The waste hierarchy is set out at Article 4 of the revised Waste Framework (Directive 2008/98/EC). The definitions of each of the stages can be found in Article 3 of the Directive. Non-exhaustive lists of disposal and recovery operations can be found in Annexes I and II of the Directive, respectively.

Section 2 – What this means for common materials and products

2.1 The ***table on the next page*** illustrates how the hierarchy applies for a range of common materials and products. The list is not exhaustive, and could be expanded in future years.

If your business or public body produces or handles waste materials or products not listed overleaf, you still need to apply the waste hierarchy to these wastes. Specific guidance is available for a wider range of waste products and materials. For instance:

- if you are involved in the construction sector tailored guidance is available at *www.crwplatform.co.uk/conwaste* and *www.wrap.org.uk/construction*.
- If you deal with paint, you can find ideas on how to re-use your surplus at *http://www.communityrepaint.org.uk/*

The ranking of the various waste management options are based on ***current scientific research*** on how the options impact on the environment in terms of climate change, air quality, water quality and resource depletion. [1]

Defra, WRAP and the Environment Agency have produced an evidence paper entitled *Applying the Waste Hierarchy: Evidence Summary*. See *http://www.defra.gov.uk/publications/2011/06/15/pb13529-waste-hierarchy-summary./* It summarises the ***current scientific research*** on the environmental impacts of various waste management options for a range of materials and products.

The rankings in this guidance are based on the evidence paper. Over time, new technologies may emerge, and the comparative efficiency of waste management options may change. Likewise, new research is published all the time.

To take account of such changes, this guidance and the accompanying evidence paper will be reviewed and updated on an annual basis. For further details on this process see *Applying the Waste Hierarchy: Evidence Summary, section 7.*

[1] With a few exceptions (eg aggregates), emissions from transport of recyclable materials (including collection from the kerbside) are a very small fraction of the total impacts, and they are dwarfed by the benefits of recycling.

2.2 *For most materials, the waste hierarchy ranking applies as described in Section 1.1.* But for the materials below, the evidence suggests that waste management options which are not in keeping with the waste hierarchy order are better for the environment:

- for *food*, current research shows that anaerobic digestion is environmentally better than composting and other recovery options; (the evidence on which this is based is summarised at *Applying the Waste Hierarchy: Evidence Summary, section 9*
- for garden waste and for mixtures of food waste, dry anaerobic digestion followed by composting[2] is environmentally better than composting alone
- for *lower grade wood* energy recovery options are more suitable than recycling. To determine the grade of wood you handle, please see Wood Recyclers Association grading structure for UK derived, non-virgin wood *Applying the Waste Hierarchy: Evidence Summary, section 19.*

[2] Anaerobic digestion on its own is unable to break down the woody material found in garden waste, however dry anaerobic digestion facilities usually include a post-digestion composting stage to achieve this breakdown

Paper and Card	Food	Garden Waste	Textiles	Wood	Glass	Metals	Plastics±	WEEE	Tyres	Residual 'black bag'
Prevention	Prevention	Prevention	Prevention	Prevention	Prevention	Prevention	Prevention	Prevention	Prevention	Prevention
Preparation for re-use	Preparation for re-use	Preparation for re-use	Preparation for re-use	Preparation for re-use	Preparation for re-use	Preparation for re-use	Preparation for re-use	Preparation for re-use	Re-treading	
Recycling	Anaerobic Digestion	Anaerobic Digestion (dry)[2]	Recycling	Recycling; energy recovery♦ (preferable to recycling for lower grade materials)	Recycling in a remelt process	Recycling	Closed loop recycling	Recycling (esp. suitable for metals and high quality plastic)	Recovery: use in road surfaces	Solid recovered fuel derived from MHT or MBT, where it replaces coal* Energy Recovery, all technologies (Heat Only) Energy Recovery, all technologies (CHP) Energy Recovery, all technologies (Electricity Only) MBT or MHT outputs used as fuel (but do not replace coal) or *
	Composting; other energy recovery technologies	Composting; other energy recovery technologies			Other recycling		Other recycling		Energy recovery in cement kilns	
Energy recovery♦ (esp. suitable for short fibres or contaminated materials)			Energy recovery♦				Energy recovery♦	Energy recovery♦ (esp. suitable for non-hazardous mixed plastic)	Energy recovery through pyrolysis	
					Energy recovery♦	Recycling after energy recovery			Other recovery (eg drainage fill & sea defences)	
									Gasification /incineration with EfW	
Disposal	Disposal	Disposal	Disposal	Disposal	Disposal	Disposal	Disposal	Disposal	Microwave treatment	Disposal

*the impact of CHP technology, which can improve the efficiency of each of these options, is not illustrated here

± the hierarchy may be different for some forms of bio-based plastics

♦'energy recovery' covers a range of technologies, some of which will be more environmentally beneficial than others. Future versions will differentiate between technologies as more scientific evidence becomes available.

*2009 AEA – Report to the Welsh Assembly Government: *Modelling of Impacts for Selected Residual Waste Plant Options using WRATE*

Section 3 – Your legal obligations

3.1 What does my business or organisation have to do by law?

(a) Does your business or public body (including local authorities on behalf of householders) ***produce or handle waste***? This includes importing, producing, carrying, keeping, treating or disposing of waste; dealers or brokers who have control of waste, and anyone responsible for the transfer of waste.

To check whether something is waste see the 'draft' Definition of Waste 2010 guidance visit *http://webarchive.nationalarchives.gov.uk/20100505154859/http:/www.defra.gov.uk/corporate/consult/waste-definition/index.htm*

To note: Defra will publish a revised version of the Definition of Waste Guidance later this year.

If yes, you need to take all such measures as are reasonable in the circumstances to apply the waste hierarchy to prevent waste, and to apply the hierarchy as a priority order when you transfer your waste to another person.

This duty will also apply to those who operate under waste exemptions from the Environmental Permitting Regime.

You will need to add a declaration on your Duty of Care Waste Transfer Notes and Hazardous Waste Consignment Notes confirming that you have complied with this duty. Here is some text you can use:

'*I confirm that I have fulfilled my duty to apply the waste hierarchy as required by regulation 12 of the Waste (England and Wales) Regulations 2011."*

ⓘ your duties are set out at in Regulations 12, 15 and 35 of the Waste (England and Wales) Regulations 2011.

In addition, if you produce, import, carry, keep, treat or dispose of waste, or as a broker control such waste, you have a legal **duty of care** to take all reasonable steps to keep your waste safe. If you give your waste to someone else, you must be sure they are authorised to take it and can deal with it or dispose of it safely. For further details visit *http://www.environment-agency.gov.uk/business/topics/waste/default.aspx*

(b) Are you operating a site that requires a permit under the Environmental Permitting Regulations (England and Wales) Regulations 2010?

In addition to the duties described at **(a)** above, a condition in **new or revised permits** will place a duty on the permit holder to apply the hierarchy. For example you could minimise process loss through improvements to the way your business operates and/or considering recycling options for any waste produced at the site.

If you are an existing permit holder, this new condition will apply when your permit comes up for review. For more details, see Environmental Permitting Guidance.

3.2 What does this mean in practice?

You can save money by applying good environmental practice:

- plan how you will apply the waste hierarchy
- monitor your performance regularly
- know what waste you are producing, and make efforts to produce less,
- sort and segregate the waste you do produce to help you or others recover value from it

Other factors will influence the decisions you make about waste generation and management, such as which options are technically feasible, which are economically viable, and which best protect natural resources or human health.[3]

These other factors are better considered on a case-by-case basis, according to the circumstances of your business or organisation. Whether and how they are relevant will depend for example on the geographical location, type and size of your business/organisation.

If you are making decisions on waste management which do not comply with the waste hierarchy because of these other factors, ***you must be able to justify them***. It is good practice to keep a record of your decisions.

Section 4 How do I apply the waste hierarchy?

4.1 This section sets out key questions which you need to work through, particularly when you negotiate waste management contracts.

You may find it helpful to work through the following questions to assess whether your business or organisation are applying the hierarchy. If you ***produce*** waste see Figure 1, if you ***handle*** waste see Figure 2.

[3] The qualifications to the waste hierarchy are set out in full in Article 4(2) of the revised Waste Framework Directive, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:312:0003:0030:EN:PDF.

Figure 1: Putting the hierarchy into practice if you produce waste

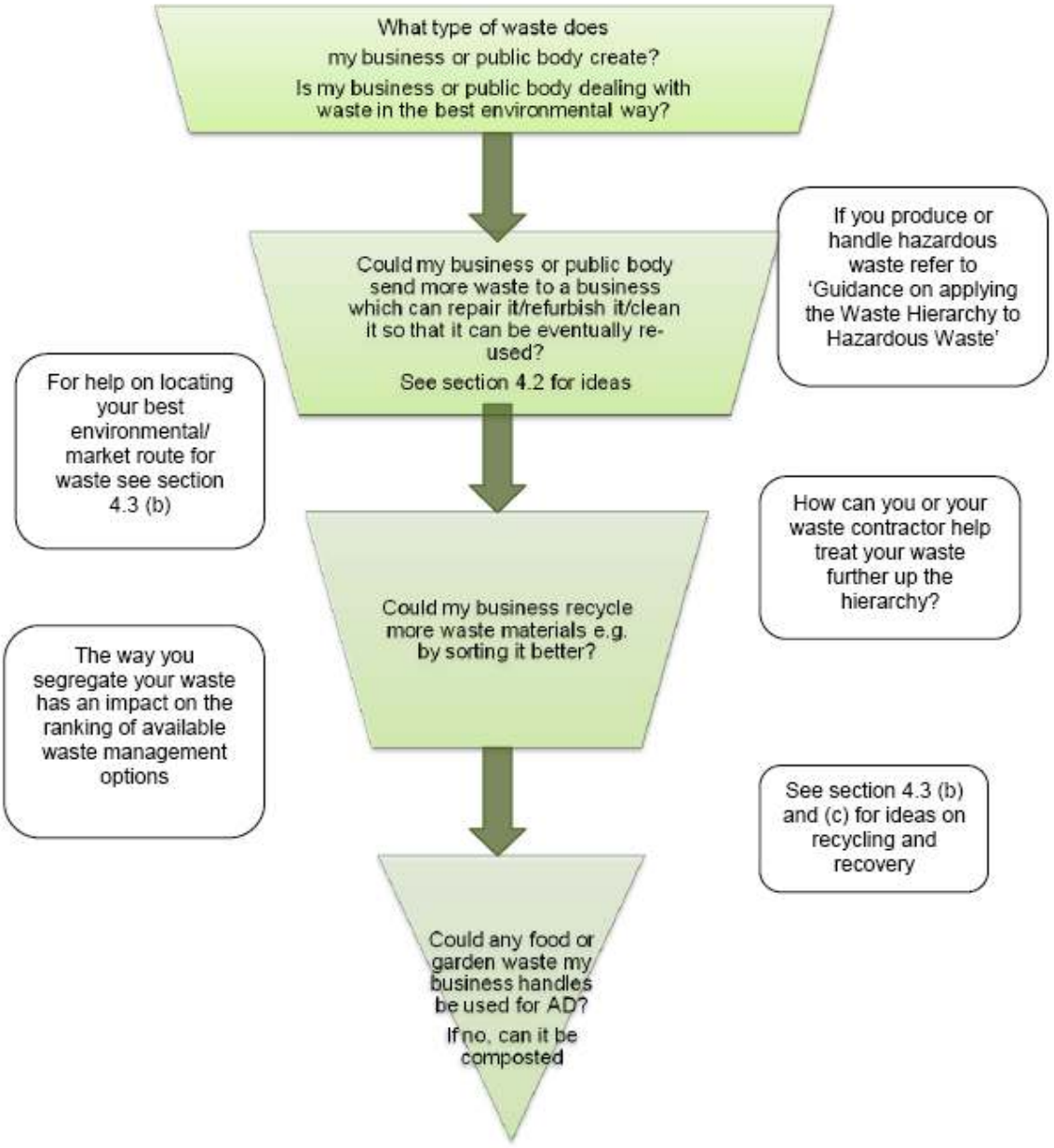
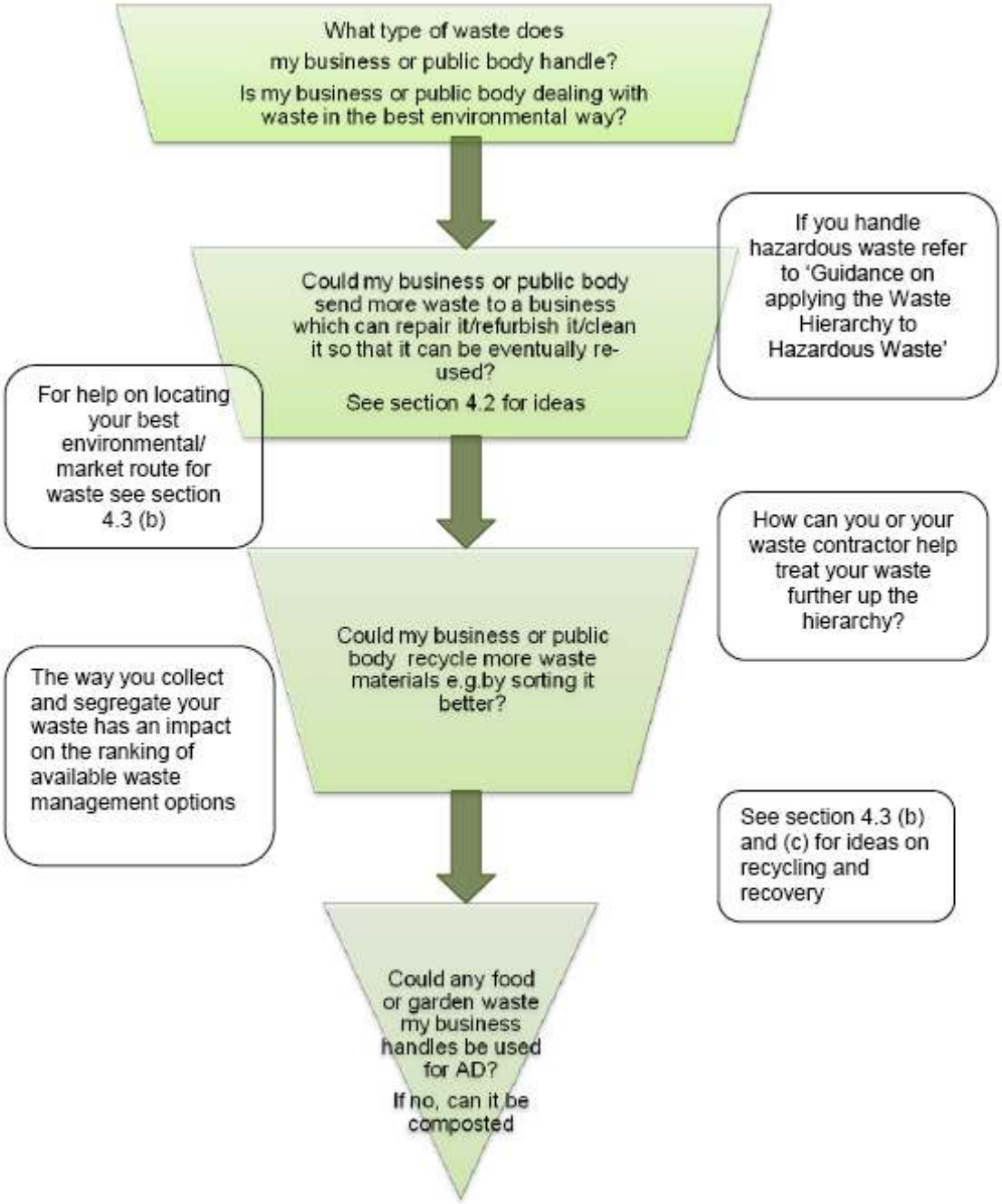


Figure 2: Putting the hierarchy into practice if you handle waste



4.2 How can my business/public body prevent any of this waste? Avoiding waste saves money.

- reduce food waste. See http://wastehierarchy.wrap.org.uk
- if your business or public body designs, manufactures or distributes goods, could you use less input material and/or less hazardous material in design and manufacture? Could your surplus materials be someone else's resource? Are you using the right amount of packaging for shipping? Could you design products to last longer or be repaired more easily? Are your products subject to legal eco-design requirements, and do they *comply? See* http://wastehierarchy.wrap.org.uk
- sell/donate/swap unwanted items (textiles, furniture, electrical and electronic equipment, toys or leisure equipment etc)
- retain and use electrical and electronic equipment, textiles or furniture for longer. Could you refurbish or repair them instead of buying new ones?[4]
- hire or lease rather than purchase electrical and electronic equipment, textiles or furniture. Buy or re-use second-hand and vintage items. See http://wastehierarchy.wrap.org.uk
- maximise the life of tyres through transport and logistics practices. Tyres can be re-used if they are still in good enough condition. For example, tyres which still have enough tread can be re-fitted on vehicles if they have been inspected and marked appropriately.
- re-use carrier bags, refill water containers from the tap rather than buy bottled water, and use durable rather than disposable cutlery and containers. Ask your suppliers to use re-useable packaging, and do so yourself with your customers
- If you are in the construction sector, tailored guidance is available at www.crwplatform.co.uk/conwaste *and* www.wrap.org.uk/construction

4.3 What do I currently do with my waste?

Is there anything that I or my waste contractor(s) can do to make my waste - or more of my waste - suitable for use in a better environmental option than the one(s) I am using now?

(a) Could it be prepared for re-use? (e.g. by sorting, cleaning)

In this document (as in the legislation), when we speak about '*re-use*', we mean using again a substance, product or material before it becomes waste.

'*Preparing for re-use'* relates to checking, cleaning or repairing activities which allow a waste substance, product or material to be re-used without any other pre-processing. For example industrial machinery, clothes, electronic and electrical equipment and furniture can be repaired or refurbished and then sold on. See http://wastehierarchy.wrap.org.uk for more ideas.

[4] 59% of office machinery and computers disposed of by businesses are re-usable without repair. 49% of audio-visual, photographic and computers, calculators etc of by households is re-usable without repair.

It is not always easy to make a distinction between what is waste and what is not. There is no definitive list; it depends on specific circumstances. To help, later this year Government will publish guidance on the legal definition of waste and its application. If you are unsure whether something is waste look at the 'draft' 2010 Definition of Waste consultation guidance document at *http://webarchive.nationalarchives.gov.uk/20100505154859/http:/www.defra.gov.uk/corporate/consult/waste-definition/index.htm*

(b) Could my waste/more of my waste be recycled?

A wide variety of materials can be recycled; you need to discuss your needs with companies or organisations who can provide this service. The ***NetRegs Waste Directory*** *(*http://www.wastedirectory.org.uk/*)* offers a search engine that allows businesses to find out where they can recycle different types of waste. Make sure any service you use is legally permitted to take the waste.

The way your waste is sorted can have a direct effect on how it can be recycled. It's worth discussing with your contractor how you can get the most value from your waste. See http://wastehierarchy.wrap.org.uk

(c) Is there anything else that could be extracted from my waste (energy or product)?

There are many different energy recovery technologies – including combustion with energy recovery, anaerobic digestion, processes including gasification and pyrolysis, advance biorefinery technologies. Some waste contractors will use energy recovery rather than landfill.

There are legal requirements on the treatment of food waste, as well as quality standards. Please visit:

- *http://www.defra.gov.uk/food-farm/byproducts/* for information on the legal rules;
- *http://www.wrap.org.uk/composting/production/download_pas_100.html* for the PAS 100 standard on compost;
- *http://www.organics-recycling.org.uk/index.php?option=com_docman&task=cat_view&gid=64&Itemid=86* for the PAS 110 standard on digestate;
- *http://www.environment-agency.gov.uk/business/topics/waste/114395.aspx* for Quality Protocols on compost and digestate.

Organisations who are considering using or investing in anaerobic digestion can find advice at http://www.biogas-info.co.uk/. Other information is available from *http://www.nnfcc.co.uk/energy-fuels*.

The European Recovered Fuel Organisation's webpages give detail of technologies and quality standards (*http://erfo.info/Quality.6.0.html*).

4.4 Other key sources of support

A simple summary of the benefits for all businesses of sustainable waste management, starting with waste prevention, can be found on the ***Business Link*** website[5]. This includes guidance tailored to individual business sectors.

For local authorities, WRAP's Waste Prevention Toolkit[6] offers interactive guidance on planning, developing, implementing or reviewing waste prevention plans.

The Environment Agency has developed ***WRATE***[7], a piece of software which allows businesses and public bodies to calculate the environmental impacts of their systems, including waste management impacts. This guidance reflects the key assumptions in WRATE, and we recommend that businesses and public bodies use WRATE to make decisions based on this guidance but more finely tailored to their circumstances.

The Environment Agency is also developing a set of tools (known as ***Resource Efficiency Appraisal Development*** (READ)) which businesses and organisations will be able to use to benchmark how well they manage resources such as materials, waste and packaging, and the biggest opportunities to improve. These tools are available on the Environment Agency and WRAP websites.
http://www.environment-agency.gov.uk/business/topics/performance/121909.aspx
http://wastehierarchy.wrap.org.uk/

The ***"Duty of Care" Code of Practice*** is a statutory document which explains how everyone, producers, carries, imports, who keeps, treats or disposes of controlled waste, or as brokers or, dealer controls such waste can meet the legal duty set out in section 34 of Environmental Act 1990 to manage and transfer that waste correctly to enable its safe recovery or disposal without harming the environment. All waste holders are still required to comply with the statutory duty of care, and in doing so, they should have regard to the Code of Practice.

5 http://www.businesslink.gov.uk/bdotg/action/detail?r.s=sc&r.l1=1079068363&r.lc=en&r.l3=1079427402&r.l2=1079363672&r.i=1079427949&type=RESOURCES&itemId=1079427453&r.t=RESOURCES

6 *www.wrap.org.uk/applications/waste_prevention_toolkit/restricted.rm*

7 *http://www.environment-agency.gov.uk/research/commercial/102922.aspx*