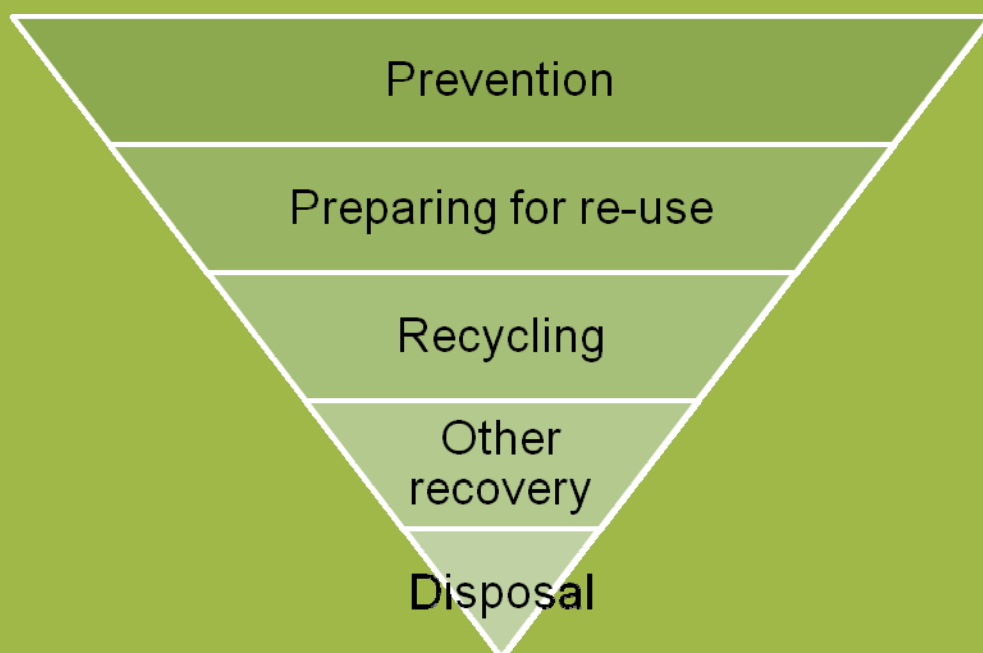


GUIDANCE ON APPLYING THE WASTE HIERARCHY



October 2011



Department of the
Environment

www.doeni.gov.uk

This guidance is produced under regulation 17(5) of the Waste Regulations (Northern Ireland) 2011 and any person subject to the regulation 17 duty must have regard to it.

The Waste Regulations (Northern Ireland) 2011 came into operation on 8 April 2011. The regulation 17 duty comes into operation six months after this date i.e. 8 October 2011.

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This document/publication is also available on our website at http://www.doeni.gov.uk/index/protect_the_environment/waste.htm

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

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Or email it to alison.simms@doeni.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:

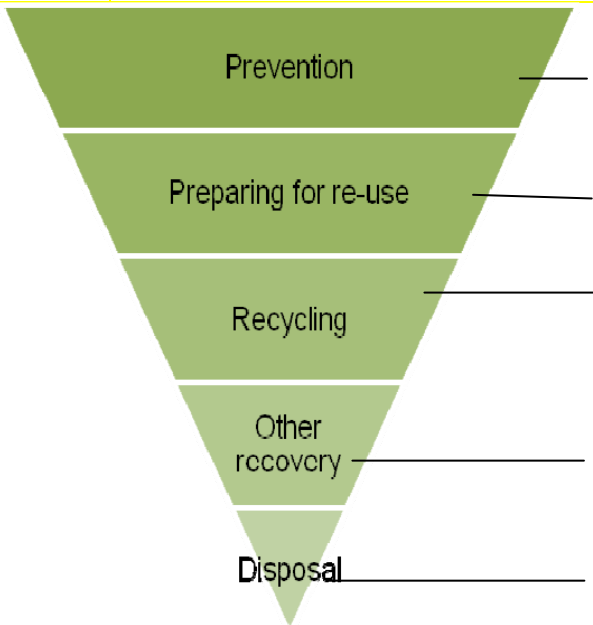
- what the waste hierarchy is (Section 1);
- how it works for a range of common materials and products (Section 2);
- what businesses and public bodies need to do (Section 3)
- key questions and ideas for dealing with waste in line with the hierarchy (Section 4).

The waste hierarchy applies to all waste including hazardous waste. Guidance on the specific application of the hierarchy to hazardous waste will be produced in due course. In the interim, the general principles outlined in this guidance should be applied to hazardous waste.

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 or incineration without energy recovery).

Stages	Include
 <p>Prevention</p>	Using less material in design and manufacture: Keeping products for longer: Re-using materials: Using less hazardous materials.
<p>Preparing for re-use</p>	Checking, cleaning, repairing, refurbishing, whole items or spare parts.
<p>Recycling</p>	Turning waste into a new substance or product, including compost if it meets quality protocols standards.
<p>Other recovery</p>	Includes anaerobic digestion, incineration with energy recovery, gasification and pyrolysis which produce energy (fuels, heat and power) and materials from waste; some backfilling operations.
<p>Disposal</p>	Landfill and incineration without energy

① 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.wrap.org.uk/construction, <http://www.constructingexcellence.org.uk/> and <http://www.bre.co.uk/>

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

DOE, WRAP and the Northern Ireland Environment Agency have produced an evidence paper entitled [Applying the Waste Hierarchy: Evidence 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 a regular basis. For further details on this process see section 7 of the abovementioned document [Applying the Waste Hierarchy: Evidence Summary](#).

(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 [www.http://rethinkwaste.org](http://rethinkwaste.org); the evidence on which this is based is summarised in section 9 of the document [Applying the Waste Hierarchy: Evidence Summary](#)
- for garden waste and for mixtures of food waste, dry anaerobic digestion followed by composting² 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 in section 19 of the document [Applying the Waste Hierarchy: Evidence Summary](#)

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	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 ♦ (esp. suitable for short fibres or contaminated materials)	Composting; other energy recovery technologies	Composting; other energy recovery technologies			Other recycling		Other recycling	Energy recovery in cement kilns	Energy recovery through pyrolysis	Energy Recovery, all technologies (Heat Only)
			Energy recovery ♦		Energy recovery ♦	Recycling after energy recovery	Energy recovery ♦	Energy recovery ♦ (esp. suitable for non-hazardous mixed plastic)	Other recovery (eg drainage fill & sea defences)	Energy Recovery, all technologies (CHP)
Disposal	Disposal	Disposal	Disposal	Disposal	Disposal	Disposal	Disposal	Disposal	Gasification/incineration with EfW	MBT or MHT outputs used as fuel (but do not replace coal) or *
									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 district councils on behalf of householders) **produce or handle waste**³? This includes importing, producing, collecting, carrying, keeping, treating or disposing of waste; brokers or dealers 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. This guidance applies to Northern Ireland.

If you answered yes to the question above, 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 Waste Management Licensing Regime.

You will need to add a declaration on your Duty of Care Transfer 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 17 of the Waste Regulations (Northern Ireland) 2011.'

- ① your duties are set out in Regulations 17 and 33 of the Waste Regulations (Northern Ireland) Regulations 2011.

In relation to hazardous waste, you will also need to add a declaration on your Hazardous Waste Consignment Notes confirming that you have complied with this duty. This declaration is shown in Schedule 4 (Form of Consignment Note) of the Hazardous Waste Regulations (Northern Ireland) 2005 as amended by regulation 63 of the Waste Regulations (Northern Ireland) 2011.

In addition, if you import, produce, collect, carry, keep, treat or dispose of waste, or as a broker or dealer 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 and that all of the appropriate paperwork is completed and retained for inspection, if necessary, by the NIEA or your district council. For further details see <http://www.doeni.gov.uk/niea/waste-home.htm>

³ 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. This guidance applies to Northern Ireland.

- (b) Are you operating a site that requires a licence/permit under the Waste Management Licensing Regulations (Northern Ireland) 2003 or the Pollution Prevention and Control Regulations (Northern Ireland) 2003?

In addition to the duties described at **(a)** above, a condition in **new or revised licences/permits** will place a duty on the licence/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 licence/permit holder, this new condition will apply when your licence/permit comes up for review. For more details see:
<http://www.doeni.gov.uk/niea/waste-home/authorisation/license.htm>

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.⁴

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.

⁴ 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

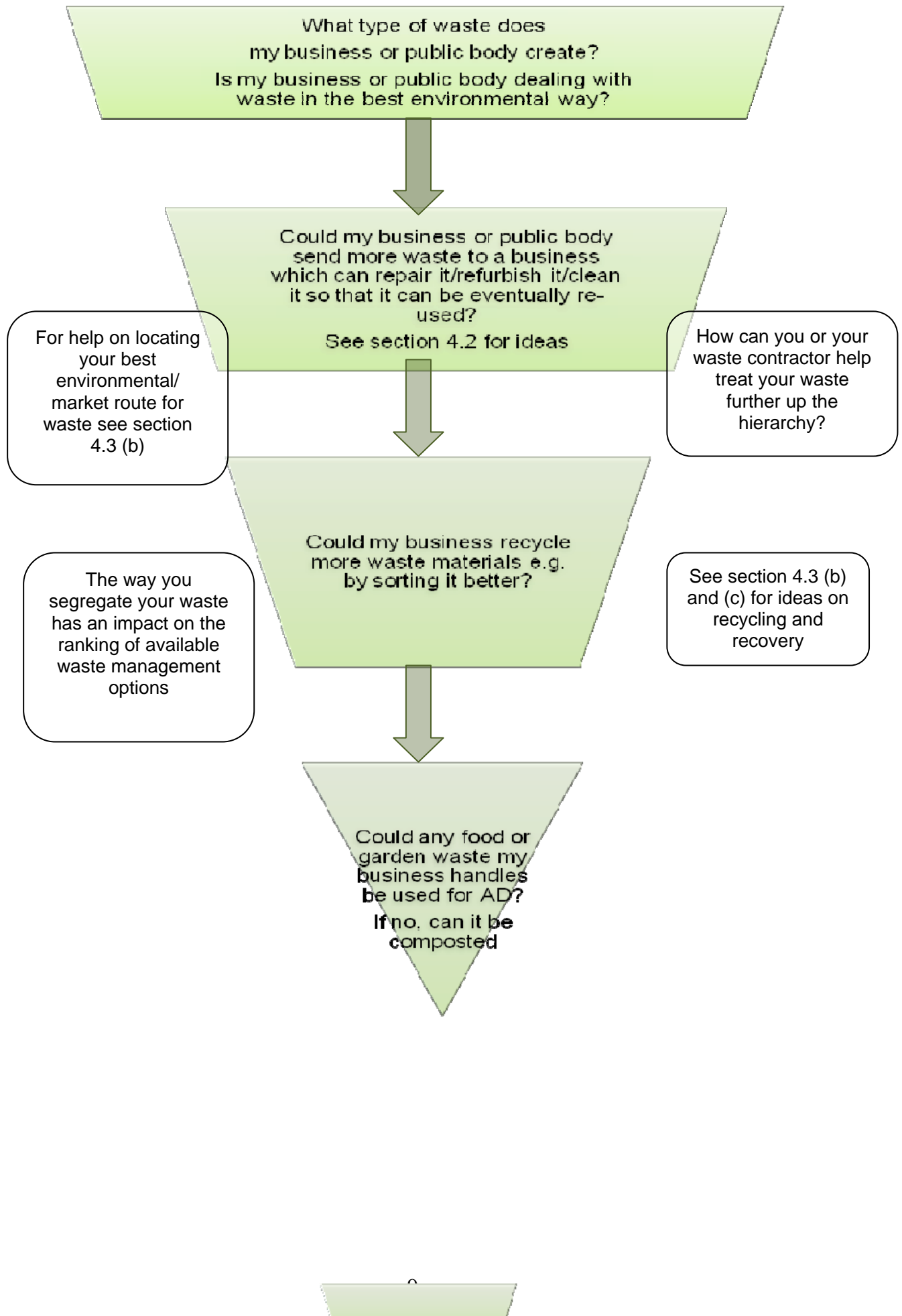
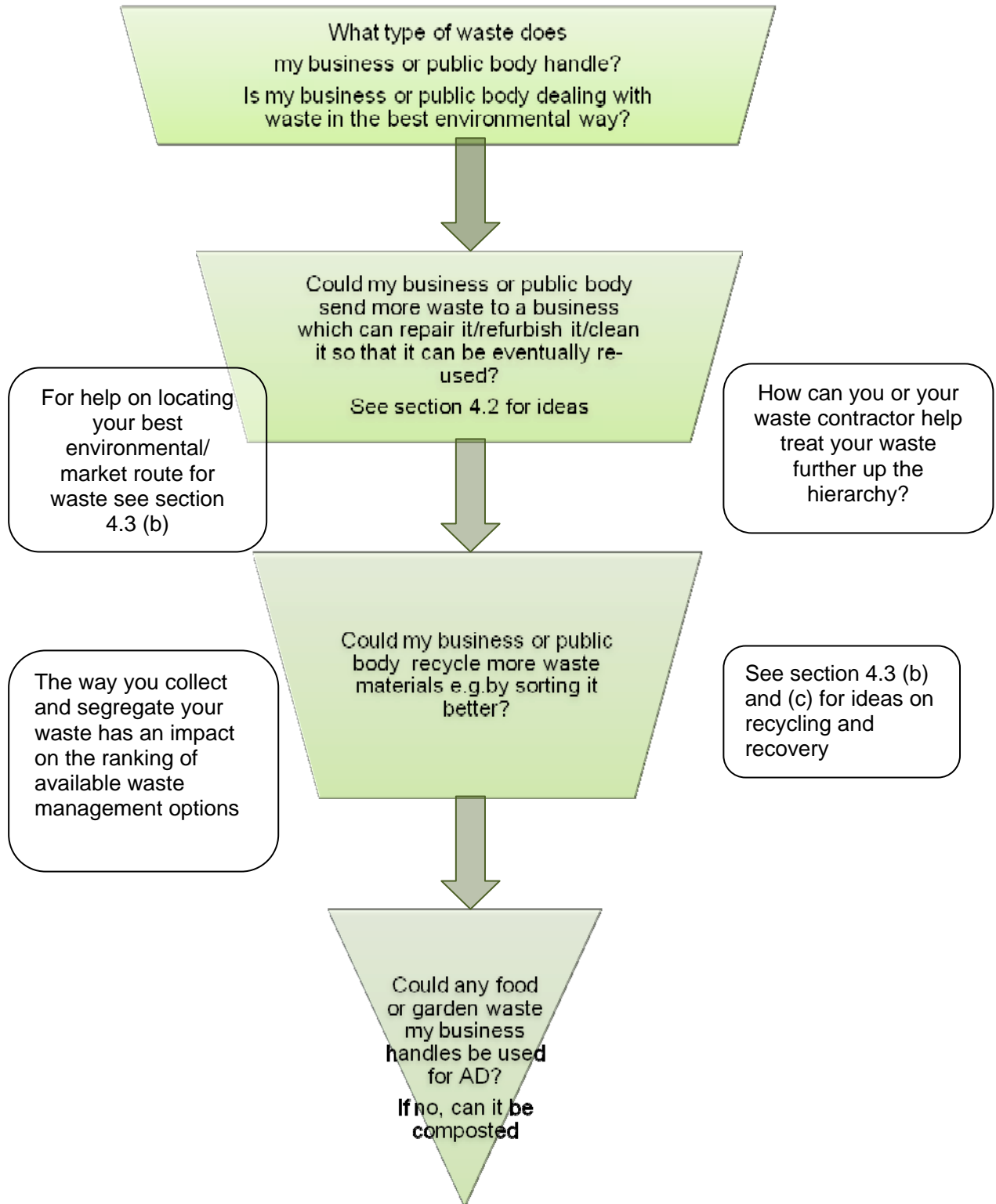


Figure 2: Putting the hierarchy into practice if you handle waste



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

- reduce food waste. See <http://www.lovefoodhatewaste.org/>
- 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?⁵
- 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 <http://www.wrap.org.uk/construction>; <http://www.constructingexcellence.org.uk/> and <http://www.bre.co.uk/>

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

⁵ 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.

electrical equipment and furniture can be repaired or refurbished and then sold on. See <http://wastehierarchy.wrap.org.uk> for more ideas.

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, Defra will publish guidance on the legal definition of waste and its application. This guidance applies to Northern Ireland. If you are unsure whether something is waste see the 'draft' 2010 Definition of Waste consultation version guidance document visit <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 Northern Ireland Business info (<http://www.nibusinessinfo.co.uk/>) and NIEA (http://www.doeni.gov.uk/niea/waste/public_req.htm) offers a search engine that allows businesses to find out where they can recycle different types of waste. Make sure any waste operator you use is legally authorised to take the waste.

The way your waste is sorted can have a direct effect on how it can be recycled or on the quality of recyclates. A better quality recyclate can produce a better end product, which, in turn, can affect the cost of waste. In addition to the introduction of the waste hierarchy, the Waste Framework Directive now requires at least paper, glass, metals, plastics and bio-wastes to be collected separately from other waste for the purposes of recycling. Therefore, it's worth discussing with your contractor how you can get the most value from your waste and how you can best comply with the requirements to separate these materials for recycling. 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://archive.defra.gov.uk/foodfarm/byproducts/wastefood/composting/index.htm> 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.organicsrecycling.org.uk/index.php?option=com_docman&task=view&gid=64&Itemid=86 for the PAS 110 standard on digestate;
- http://www.doeni.gov.uk/niea/index/about-niea/better_regulation/waste_quality_protocols.htm 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.nfcc.co.uk/energy-fuels>. General information on sustainable energy in NI is available on <http://www.detini.gov.uk/deti-energy-index/deti-energy-sustainable.htm>.

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 Northern Ireland **Business info** website⁶. This includes guidance tailored to individual business sectors.

For district councils, WRAP's Waste Prevention Toolkit⁷ offers interactive guidance on planning, developing, implementing or reviewing waste prevention plans.

The Environment Agency in England and Wales has developed **WRATE**⁸, 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. However, if you need to make decisions based on this guidance but which require to be more finely tailored to your circumstances, we recommend that you use WRATE.

The "**Duty of Care**" **Code of Practice**⁹ is a statutory document which explains how everyone, who imports, produces, collects, carries, keeps, treats or disposes of controlled waste, or as brokers or, dealers control such waste can meet the legal duty set out in Article 5 of the Waste and Contaminated Land (Northern Ireland) Order 1997 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.

⁶ <http://www.nibusinessinfo.co.uk/bdotg/action/layer?site=191&topicId=1079068363>

⁷ http://www.wrap.org.uk/applications/waste_prevention_toolkit/restricted.rm

⁸ <http://www.environment-agency.gov.uk/research/commercial/102922.aspx>

⁹ <http://www.doeni.gov.uk/niea/waste-home/authorisation/dutyofcare.htm>