Reduce Re-use Recycle

a guide to minimising the environmental impact of packaging

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Creating markets for recycled resources

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Soil Association

Reduce, re-use, recycle

a guide to minimising the environmental impact of packaging

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Disclaimer

The information in this guide is correct, to the best of our knowledge, at the time of printing.

The case studies are only for illustration, they are not recommendations of one type of material, packaging system, or product.

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1 Introduction

Packaging is vital for marketing and ensuring products reach consumers in optimum condition, but at the end of its useful life, packaging becomes waste.

Burying or burning waste is a cause of pollution and resource depletion. Reusing and recycling packaging materials helps to conserve resources.

The Soil Association wants to minimise the amount of waste being generated, help conserve natural resources and reduce pollution.

Soil Association standards require licensees to minimise the environmental impacts of their packaging by minimising the amount of materials they use, maximising the amount of material that can be reused or recycled, and by using recycled materials where possible.

When consumers see the Soil Association symbol on a product, they should know that its packaging also meets the best possible environmental practice.

1.1 The Soil Association and packaging

The Soil Association is committed to promoting sustainable production and consumption. This means that what we produce and consume today should not affect the ability of future generations to meet their needs. We should be mindful of our use of natural resources and be aware of the long-term impacts of our actions on the environment.

The ever-increasing burden on the planet cannot be sustained. As the world's population expands, there is mounting stress on resources and environmental systems such as water, land and air. It is estimated that three planets' worth of resources would be needed if levels of consumption in the UK were repeated across the globe.

Packaging is a highly visible use of resources. Its use and disposal are increasingly significant environmental issues. The Soil Association wants to ensure that it is putting its principles into practice by working with licensees to address packaging issues.

Facts & figures

- 4.8 million tonnes of packaging waste are thrown away each year in the UK
- 24% of the contents of a household bin is packaging waste
- Two thirds of all packaging is used for food
- 75% of our waste ends up in landfill sites

1. Defra website; *Sustainable Development: the Government's approach – delivering UK sustainable development together* www.sustainable-development.gov.uk/key/sustainable.htm

1.2 About this guide

This guide is designed to help you minimise the environmental impacts of your packaging. It is intended to support you in meeting the Soil Association's standards for packaging (41.6). It explains why waste minimisation is important and why it is good for business. It also summarises the legal requirements that all packaging must meet.

This guide has information on packaging minimisation, reuse, recycling and using recycled content. It gives guidance on best practice in whatever materials you use. It does not prescribe what packaging you should use, but aims to help you make informed choices.

The environmental impact of packaging is linked to the product it contains. You should always consider packaging design in the context of the goods it contains and how they will be used. Packaging is not 'good' or 'bad' in itself, it is its relationship to the contents that make it so. For example, a particular glass bottle could be excessive packaging (thicker than needed) for fruit juice, just right for a fizzy fruit drink, but inadequate (too thin) for the same amount of sparkling wine[2].

From an environmental perspective, there is rarely one ideal way to package a product. You should take into account the many functions the packaging must fulfil, and make an informed decision. Your first priority is to ensure that your packaging is fit for its purpose.

This guide will help you bring environmental considerations into your packaging selection process, whether you are buying it off the shelf or designing bespoke packaging. There is guidance on best practice for the materials you select and details of where you can find out more information.

You should keep opportunities for minimising your packaging under review. Soil Association standards require you to review your packaging at least every three years (41.6.9). This is to ensure that it still meets best environmental practice. As your business changes, and packaging technology improves, it may be possible to make improvements to your packaging, to further minimise waste, and to reduce your costs.

1.3 What you can do

Waste minimisation is not just about recycling. It is about reducing the amount of raw materials you use.

This does not mean that you should prioritise weight reduction above other environmental considerations such as reuse or recyclability. One material is not necessarily better than another just because it is lighter. It is important to view your packaging as part of a system and to consider its environmental impacts as it moves through the different stages of the supply chain.

2 *Towards Greener Households: Products, Packaging and Energy*, INCPEN and Dr J M Kooijman

Your priority should be to use the minimum amount of packaging you can, while still adequately protecting and preserving your product. Eliminating unnecessary layers and wasted space and reducing the thickness of materials are good places to start. You should also consider the potential the packaging has for being returned so you can use it again, or if it can realistically be recycled.

There is rarely one right answer on how best to package your product, and that is not what this guide sets out to give you. It aims to help you consider and minimise the environmental impacts of your packaging.

2 Responsible packaging is good for business

2.1 Direct business benefits

Besides the environmental benefits, there are direct business benefits from responsible packaging:

- **Lower packaging costs = higher profits and good business sense**

Managing your use of packaging saves money and increases profits. Simple, low-cost changes to your packaging can bring substantial savings and reduce your waste disposal costs.

- **Improve your company's image**

Packaging is a big consumer issue, particularly with more environmentally aware organic consumers. Responsible packaging can give your product a competitive edge.

- **Help you meet growing legal obligations**

There is increasing legislation to promote responsible packaging. Cutting the amount you use will reduce your legal obligations and cut the cost of compliance. All companies are required to minimise their use of packaging under the Packaging (Essential Requirements) Regulations 2003. You can be prosecuted for non-compliance. By taking action now you could avoid future penalties.

i Chapter 3 has more information on legal requirements

- **Improve your efficiency and reduce your distribution costs**

As well as saving money directly on packaging costs, reducing packaging can increase supply chain efficiency and reduce transport costs. For example, a smaller pack size could mean you can get more products on to one pallet resulting in fewer lorry journeys.

- **Time spent on making good packaging decisions is never wasted**

Existing packaging can nearly always be improved. Even small changes to packaging can significantly reduce material costs, help to minimise product damage and bring wider benefits

2.2 Consumer attitudes to packaging

Consumers are increasingly concerned about the packaging of the things they buy. The Soil Association regularly receives comments from consumers about the perceived over-packaging of organic products.

In a survey by the Industry Council for Packaging and the Environment (INCPEN), consumer **attitudes towards packaging were largely negative**[1]. The majority of people felt that products are over-packaged and that this adds to the cost of what they buy. The perception was that products have too many layers of packaging, or that packaging is excessive for the goods inside.

There were similar responses in a survey of organic vegetables in supermarkets carried out by HDRA. The packaging of vegetables, particularly the amount of plastic used, was a key concern. Because many people consider organic food to be better for the environment, they would prefer to see less packaging used. They would prefer vegetables to be sold loose, or for packaging to be recyclable[2]. However, it should be remembered that the European Regulation that defines the term 'organic' requires separation of products – to prevent any mixing or contamination of organic products by non-organic.

Views of participants in the HDRA survey included:

"I am worried by the amount of packaging involved in organic vegetables, a lot of which seems not to be recyclable. It doesn't seem to fit with the organic aims."

"The biggest influence for me is the fact that organic veg in my supermarket are never available loose. They are always pre-packed (in plastic). I rarely need to buy the quantity on offer. I cannot understand why organic veg cannot be sold loose. I resent the wastage!"

Negative attitudes to packaging amongst consumers are likely to increase as councils impose tougher measures on households to reduce their waste. Possible measures could include limiting the number of refuse sacks that will be collected per household, reducing the frequency of collections, or charging by weight or volume.

Future trends

As people work longer hours outside the home and disposable income rises, less time is spent preparing and cooking meals at home. This is leading to **increased demand for pre-prepared** or ready-made foods. This demand for convenience is resulting in greater amounts of packaging waste.

1. *Consumer Attitudes to Packaging*, survey carried out by INCPEN, 2005. This survey was in relation to all packaging, and does not relate specifically organic products. The full results are available from INCPEN at www.incpen.org
2. *Rising to the Challenge: The final report for HDRA members Supermarket Watch*, HDRA, August 2005. The full results are available from Garden Organic (formerly HDRA) at www.gardenorganic.org.uk

A significant trend influencing the future of packaging is **decreasing household size**. More of us now live alone and so are buying proportionately more goods. This has implications on packaging use and waste as consumers demand a wider selection of pack sizes – especially more individual and convenience packs for smaller households. A person living alone has roughly double the environmental impact of a person living in a large household[3].

Increasing consumer concern about the **provenance** and **integrity** of food is also driving changes in packaging. Labelling, tamper-evidence and traceability all have implications for packaging design.

By making sure your packaging conforms to the best possible practice, you can help add to the positive image and competitiveness of your product.

2.3 Retail trends

Most food is bought from **supermarkets**, including around 75% of all organic food.

This supermarket culture, with its stringent supply chain demands and increasing competition for shelf space, is driving changes in packaging design. As supermarkets strive to minimise costs, pressure on suppliers to provide 'shelf ready' packaging is increasing. This enables supermarkets to get goods on to the shelves more quickly and cheaply.

Pressures to reduce packaging waste are likely to increase as a result of **public commitments** by retailers. For example, under the 2005 Courtauld Commitment, thirteen grocery retailers committed to help the government reach its targets of reducing the amount of food and packaging thrown away by consumers[4].

The fastest growing retail sector is direct sales from the producer to the consumer. These forms of selling (including **internet sales**, **mail order** and **farmers' markets**) place specific demands on packaging, such as the need to keep products chilled and protected from damage during transport. It also presents excellent opportunities for minimising packaging such as through bulk orders, reusable transport containers and the need for minimal presentation materials.

2.4 Legislative trends

You should also refer to Chapter 3 on the legal requirements for packaging

Legislation directed at those responsible for packaging is likely to increase further. The **European Commission** wants Member States to do more to reduce and recover

3. *Towards Greener Households: products, packaging and energy,* INCPEN and Dr J M Kooijman.
4. For more information on the Courtauld Commitment see www.wrap.org.uk

packaging waste and reduce the burden on landfill sites. The Commission also wishes to see a reduction in the use of virgin materials.

The **European Packaging and Packaging Waste Directive 2004 (2004/12/EC)** was published in February 2004. The deadline for implementation by Member States was August 2005. The key changes from the previous directive (94/62/EC) are to the recycling targets.

Under the new Directive, by the end of 2008:

- a minimum of 60% of all packaging waste (by weight) must be recovered, including any that is processed in incineration plants to recover energy
- between 55% and 80% of all packaging waste (by weight) must be recycled
- each material has a minimum recycling rate that must be reached: 60% for glass, 60% for paper/board, 50% for metals, 22.5% for plastic and 15% for wood.

Packaging regulations in the UK have so far succeeded in raising packaging waste recycling from around 27% in 1997, to almost 50% in 2004.

New targets in the UK packaging regulations, announced in 2005 and set until 2010, will see businesses having to recycle and recover ever increasing amounts of packaging waste (see figure 1 below). Defra has also confirmed that a number of changes will be made to the regulations, most notably new obligations on franchisors, licensors, and pub operating businesses.

Defra will oversee the changes in England. In Scotland and Wales, the Scottish Executive and the Welsh Assembly Government respectively will make the changes. In Northern Ireland, the Environment and Heritage Service is responsible.

Figure 1 Packaging recovery and recycling targets (%)

	2006	2007	2008	2009	2010
Aluminium	29	31	32.5	33	35.5
Glass	65	69.5	73.5	74	74.5
Paper	66.5	67	67.5	68	68.5
Plastics	23	24	24.5	25	25.5
Steel	56	57.5	58.5	59	59.5
Wood	19.5	20	20.5	21	21.5
Overall recovery	66	67	68	69	70
Minimum amount to be achieved through recycling	92%	92%	92%	92%	92%

Source: Defra, November 2005

3 Legal requirements

There are basic **legal requirements** that all companies who place packaged products on to the market must meet. Soil Association standard 41.6.5 requires you to ensure that your packaging meets all relevant legislation relating to packaging, packaging waste, and materials in contact with food. We outline some of the main legislation below for guidance only. You should refer to the full regulations to ensure you comply. Failure to comply with these legal obligations could lead to prosecution.

Complying with the Soil Association's standards for packaging, and using this guide, should help you meet the regulations covered below.

The **European Packaging and Packaging Waste Directive 2004 (2004/12/EC)** aims to reduce the environmental impacts of packaging through minimisation and sets targets for recycling and recovering packaging waste. These targets are revised every five years.

The directive has been implemented into UK law through two regulations:

1) The Packaging (Essential Requirements) (Amendment) Regulations 2006
2) The Producer Responsibility Obligations (Packaging Waste) Regulations 2005.

A summary of the EU directive is available from the European Commission. It is available online at europa.eu.int/scadplus/leg/en/lvb/l21207.htm

The Environment Agency's www.netregs.gov.uk website has plain language guidance for business on environmental legislation.

3.1 Packaging (Essential Requirements) (Amendment) Regulations 2006

These regulations require that all packaging placed on the market is **minimised**, that it can be **recovered and/or recycled**, and that packaging contains only restricted amounts of certain hazardous substances, such as heavy metals. Local Authority Trading Standards and Consumer Protection Departments enforce these basic principles:

- **minimising packaging** volume and weight, consistent with the level necessary for safety, hygiene and acceptance by the consumer
- design and use of packaging so it can be **reused** and/or **recovered**
- limits on the concentration of some **heavy metals** (lead, cadmium, mercury and hexavalent chromium) in packaging.

The regulations apply throughout the UK to anyone who:

- is responsible for **packing** or **filling** products into packaging, or

- **presents themselves as being responsible**, by putting their name, brand, trade mark or other distinctive mark on the packaging, or

- is the **importer** into the UK of the packed goods.

The regulations apply **regardless of turnover and quantities** of packaging manufactured. They are also relevant to those specifying, designing and producing packaging.

A **responsible person** (see above) should demonstrate compliance with the regulations by providing the enforcement authorities (Trading Standards) with technical documentation within 28 days of a request. Such a request can be made at any time. The responsible person must be able to supply documentation for up to four years from the date on which the packaging is placed on the market.

ℹ The full text of the regulations is available from the Office of Public Sector Information. It is available online at www.opsi.gov.uk/si/si2003/20031941.htm

ℹ Guidance notes on the Essential Requirements regulations are available by searching for 'packaging' online at www.dti.gov.uk/publications

3.2 Producer Responsibility Obligations (Packaging Waste) Regulations 2005

These regulations provide the statutory framework by which the UK must meet the minimum recovery and recycling targets in the EU Directive. These regulations place obligations on UK companies that have a **turnover exceeding £2 million** and that handle more than **50 tonnes of packaging** a year. Defra is responsible for overseeing the Producer Responsibility Obligations. The Environment Agency in England and Wales, the Scottish Environmental Protection Agency, and the Environment and Heritage Service in Northern Ireland enforce these obligations.

The regulations impose three main obligations on producers:

1. **Registration obligation.** Producers must register with an agency or packaging compliance scheme by 7 April each year, pay a fee, and provide data on the amount of packaging handled in the previous year. Producers with a turnover of more than £5 million must also provide a compliance plan outlining the steps they intend to take to meet their recovery and recycling obligations.

2. **Recovery and recycling obligations.** Producers must carry out the specified tonnage of recovery and recycling of packaging waste.

3. **Certifying obligation.** At the end of the year in question, producers must provide their agency with a certificate of compliance stating whether they have met their recovery and recycling obligations.

To encourage greater consumer involvement in collecting, recycling and reusing waste, producers whose main activity is 'selling' have an additional **consumer information obligation**. Businesses must provide those they sell to, whether they are householders or other businesses, information on a range of recycling issues and provide specific information to consumers about return, collection and recovery systems and the consumers' role in these. Businesses should also explain the meaning of markings, such as recycling logos, which appear on packaging.

i The full text of the regulations is available from the Office of Public Sector Information. It is available online at www.opsi.gov.uk/si/si2005/20053468.htm

i A user's guide to the producer responsibility obligations is available from Defra. It is available online at www.defra.gov.uk/environment/waste/topics/packaging

i Chapter 9 has information on telling consumers about your packaging.

There are additional UK regulations that you must comply with if the packaging will be in contact with food:

3.3 Materials and Articles in Contact with Food (England) Regulations 2005

The European Regulation 1935/2004: 'materials and articles intended to come into contact with food' came into force in December 2004. The Materials and Articles in Contact with Food (England) Regulations 2005 interpret it into UK law. The devolved administrations of Scotland, Wales and Northern Ireland have made separate parallel legislation

These regulations:

- replace the **Materials and Articles in Contact with Food Regulations 1987** and all subsequent amendments
- state that all food contact materials and articles **should not transfer** their constituents to food in quantities which could endanger human health or make the food otherwise unacceptable to consumers
- lay down requirements for **labelling** materials and articles as suitable for food contact use
- re-enact the provisions on **regenerated cellulose film (RCF)** that will be in contact with food, establish a 'positive list' of substances that can be used in the manufacture of coated and uncoated RCF, and set migration limits for some substances. Three substances in the **phthalates group** have been removed from the **positive list** of substances that may be used in manufacturing RCF
- **permit** the use of a new type of **regenerated cellulose film** with a food contact coating consisting of plastics, which is **compostable** and **biodegradable**, with appropriate controls to protect consumers
- re-enact the provisions on **vinyl chloride monomer** – to restrict the use of vinyl chloride monomer (VCM) in the manufacture of plastics that will be in contact with food, by setting a residual limit of 1 mg of VCM per kilogram of material or article, and a migration limit of 0.01 mg of VCM per kg of food
- lay down the laboratory methods for **testing** compliance with these restrictions
- provide for the enforcement of the new **European Regulation**, and
- revise **penalties** for offences that are required under the new EC Regulation 1935/2004 so that a person found **guilty** of an offence under the regulations is liable on conviction to a **fine or imprisonment** of up to two years, or both.

The full text of the regulations is available from the Office of Public Sector Information. The regulations are available online at:

England:	www.opsi.gov.uk/si/si2005/20050898.htm
Scotland:	www.opsi.gov.uk/legislation/scotland/ssi2005/20050243.htm
Wales:	www.opsi.gov.uk/legislation/wales/wsi2005/20051647e.htm
N. Ireland:	www.opsi.gov.uk/sr/sr2005/20050210.htm

3.4 Plastic Materials and Articles in Contact with Food (amendment) (England) Regulations 2005

The European Directive 2004/13/EC: 'amending Commission Directive 2002/72/EC relating to plastic materials and articles intended to come into contact with foodstuffs'. The Plastic Materials and Articles in Contact with Food (amendment) (England) Regulations 2005 interpret this into UK law. There is parallel regulation in Scotland, Wales and Northern Ireland.

These regulations:

- set an overall **migration** limit for plastics in contact with food of 10 mg per square decimetre of plastic surface area, in general, or 60 mg per kg of food. Specifically, this applies to containers with a capacity of 0.5–10 litres, or which have a contact area that cannot be determined, and for sealing devices, such as caps, gaskets and stoppers

- establish 'positive lists' of **monomers** and starting substances permitted for use in the manufacture of food contact plastics. Many of the substances have a time limit on their use. Some of the substances have specific migration limits

- establish an 'incomplete list' of **additives** approved by the EU Scientific Committee for Food for use in plastics in contact with food

- lay down the basic rules for testing migration from food contact plastics, including **test times, temperatures and simulants**, and

- check **compliance** with the requirements of the regulations

The full text of the England regulations is available from the Office of Public Sector Information. It is available online at www.opsi.gov.uk/si/si2005/20050325.htm. The regulations relating to Scotland, Wales and Northern Ireland are being updated. Information on these is on the Office of Public Sector Information website at www.opsi.gov.uk

4 About packaging and waste

Packaging fulfils many useful functions throughout its life. It is vital for protecting products and minimising product wastage. Despite its importance, at the end of its useful life packaging becomes waste and this is placing an ever-growing burden on the environment. Packaging waste is a growing consumer issue and is drawing increasing attention from legislators. This chapter explains the different roles of packaging, the different options for its disposal and the priorities for waste reduction.

4.1 The important roles of packaging

Protecting your product and getting it to your customers in prime condition is your main concern. **Product wastage** through transport damage and spoilage is a bigger environmental issue than packaging waste. If products do not reach consumers in a useable condition and are thrown away, all the energy and resources that have gone into their production, transport and retailing, are wasted.

Specific production, processing and retailing requirements, as set down in the **organic standards** can mean that organic products have unique packaging needs.

In order to maintain **organic integrity** and **consumer confidence** in organic produce, there needs to be a clear **separation** from non-organic goods. Packaging is often used to prevent cross-contamination, and to **identify** that the produce is certified to legally defined organic standards. This is important, as organic products will often be sold alongside similar non-organic products. European Regulation 2092/91, which defines the term 'organic', requires this separation of products – to prevent any mixing or contamination of organic products by non-organic.

As organic products contain fewer additives and preservatives, their **shelf life** may be shorter, particularly for baked goods. This needs to be taken into account when packaging such products.

Packaging is vital for:

- protecting the integrity of products by preventing damage, contamination and tampering
- enabling transport and handling during manufacture, storage, distribution and sale
- preventing deterioration due to bacteria, moisture, light, heat etc
- making products attractive and giving them identity and shelf presence, distinguishing them from competitors and marketing the product to the consumer
- providing important information such as bar codes, ingredient lists and best before dates

- allowing products to be conveniently and safely handled and used by consumers
- satisfying legal and regulatory requirements.

4.2 Waste disposal

At the end of their life as packaging, the used materials become waste. There are different ways in which this waste might be dealt with, all of which have a, greater or lesser, negative impact on the environment. The choice of materials and packaging design, local waste management facilities, and the actions of individuals all determine how packaging will be disposed of and its longer term impact.

At disposal, packaging might be:

- **reused** – for the same or a different purpose
- **recycled** – to be converted into useable materials
- **composted** – at home or on a larger-scale, returning materials to their basic constituents in the form of humus
- **incinerated** – with, or without, the energy released during burning being recovered and used for heat and/or power
- **landfilled** – sent to a landfill site for long-term burial.

Final disposal by sending waste to landfill or incineration are the least desirable options as this means that the resources that have gone into producing the materials are lost forever. There are also other environmental and health concerns.

As waste breaks down in a landfill site, it produces **carbon dioxide** and **methane** – two of the gases contributing to climate change. Around a quarter of all methane

emitted in the UK comes from landfill sites. There can also be **discharges into ground water** when water already in the waste, or rainwater falling on to a landfill site, gets contaminated. Although care is taken to collect and treat this leachate before it is released, some will seep out, and mix with water in the surrounding soils. Issues for local residents can be **odour** and **noise pollution**. Landfill sites have been investigated for their **health impacts**, particularly for possible links to birth defects, cancers and respiratory illnesses such as asthma[1].

Incineration (burning waste at high temperatures to reduce the volume) is increasingly used as an alternative to landfilling. In modern incinerators, the **energy released during burning can be recovered** and used for heat and power. However, despite stringent emissions standards, there is significant debate over the environmental and health impacts of incineration. There are concerns over the **release of dioxins** and particulates that are linked to respiratory illness, cancer and birth defects. Incineration creates a by-product of toxic **ash**. This is a hazardous material that must be disposed of, usually by landfilling.

Landfilling or incinerating materials that could be re-used, recycled, or composted, is an enormous waste of valuable resources. Eighty per cent of household waste could be either recycled or composted. This could dramatically reduce the need for incineration and landfill.

The best way of dealing with waste is to not produce it in the first place!

4.3 Waste reduction before waste recycling – the 'waste hierarchy'

The '**waste hierarchy**' is a useful way to consider the different routes to minimising packaging waste. You should use it as a framework for considering the best options to minimise waste, rather than progress through it step-by-step. The basic concept is:

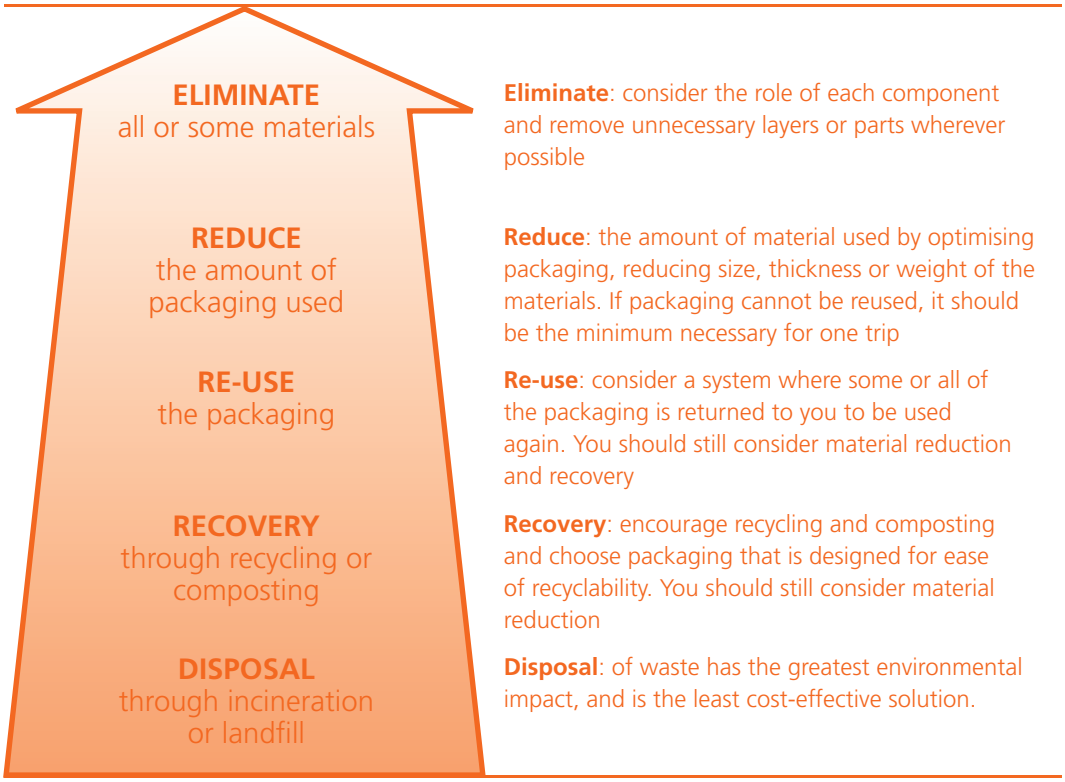
To minimise waste, we need to first reduce it at source.

After you have **eliminated** or **reduced** the amount of packaging, you should think about how it can be dealt with **after use**. All methods of dealing with waste, including **reusing** and **recycling**, use energy. The choice of waste management options will depend on whether the additional resource use (such as energy used in transporting reusable containers) is justified – for example, if the energy saved by reusing the packaging is greater than the energy used in producing new packaging from virgin materials.

These objectives are not mutually exclusive. You should view them as a whole and not as a strict order of priority, or preference for one type of packaging system over another. This is particularly important in relation to reuse and recovery options. The most appropriate solution will differ from case to case.

1. *Review of Environmental and Health Effects of Waste Management: Municipal Solid Waste and Similar Wastes*, Defra, 2004 www.defra.gov.uk/environment/waste/research/health/pdf/health-summary.pdf

Figure 2 The waste hierarchy



Even if packaging has been reduced, it is still necessary to consider reuse and recycling. In the same way, even if packaging can be reused or recycled, it is important to consider the environmental impacts of eventual disposal.

Differences in collection systems and recycling facilities, and the actions of users, can result in significant volumes of recyclable and reusable materials going to landfill. Those who are concerned with developing environmentally responsible packaging will encourage its reuse or recycling wherever possible. However, you should always consider the impacts of disposal, even though this is the least desirable option.

You must also use packaging materials with recycled content where possible (standard 41.6.8). This closes the recycling loop and builds the market for recycled materials.

i You should refer to Chapters 6 and 7 on how to reduce the environmental impact of packaging

i There is a Soil Association technical guide 'Making the most of waste in organic processing and retailing'. You can order it online at www.soilassociation.org and click 'information centre', 'library'.

5 The packaging life cycle

Standard 41.6.8 requires you to minimise the **direct and indirect** environmental impacts of your packaging during its life cycle by minimising the amount of materials you use, maximising reuse and recycling, and using recycled content. This chapter explains the life cycle of packaging and its environmental impacts.

It is important to view your packaging as a **complete system**. You should consider the primary, secondary and transport packaging together, and not look at individual parts in isolation. This enables you to understand, and minimise, the overall environmental impact of your packaging.

5.1 Life cycle thinking

Figure 3 is a very simplified version of the life cycle of packaging. The cycle starts when the **raw materials** that are used in its manufacture are extracted from the earth, for example, trees for making cardboard, or oil for making plastics. These raw materials are then **manufactured** into packaging.

After it is **filled**, the product, with its packaging, enters the **distribution** and **retail system**. Here the packaging performs its vital tasks of protecting the contents and making them transportable and saleable. Finally, the product is **used** and the packaging is **disposed** of.

There is information on waste disposal in Chapter 4

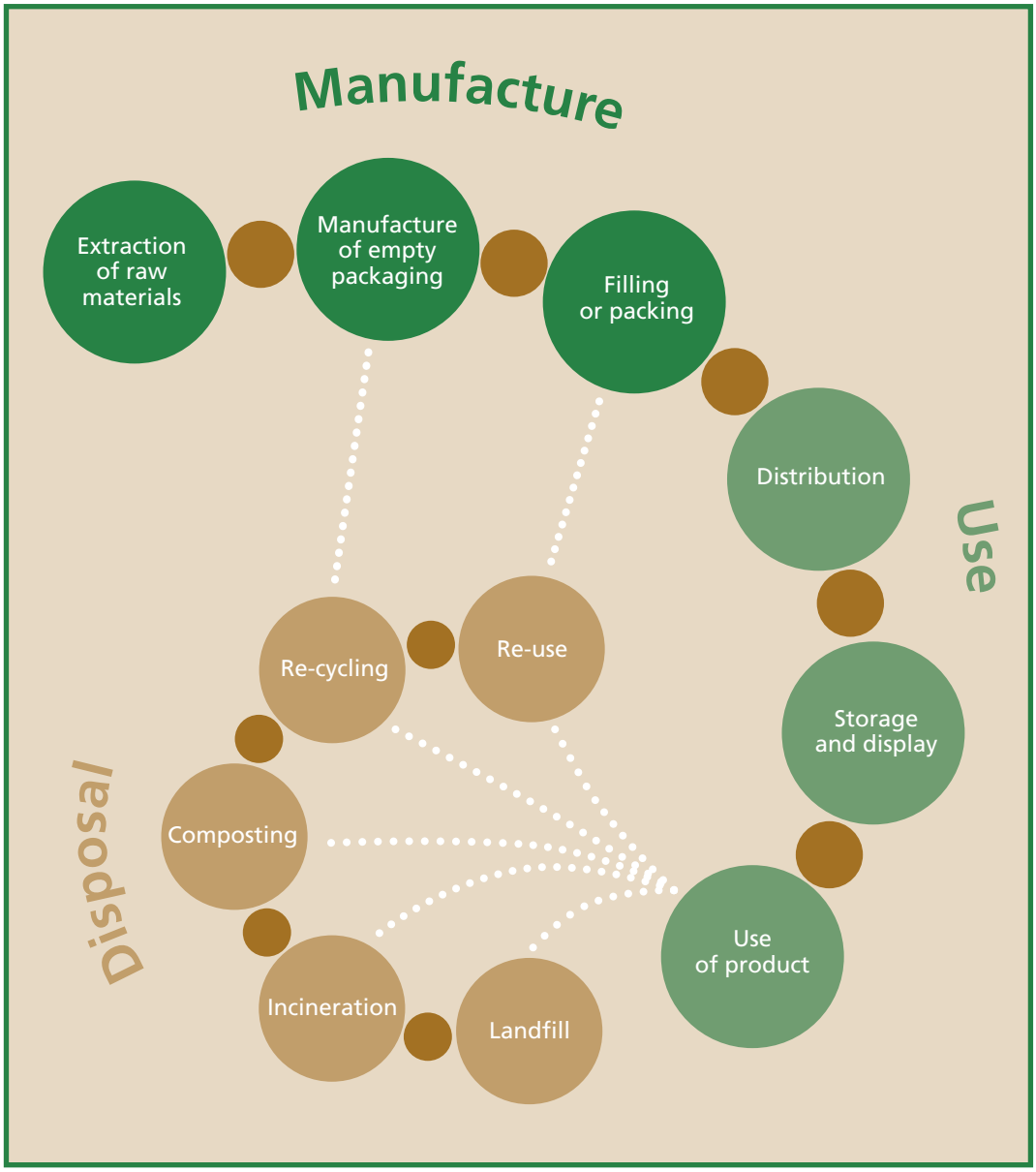
It is possible to carry out extensive **life cycle assessments**, but this is not always necessary. You can make judgements about the relative merits of different materials using common sense and readily available information.

5.2 Environmental impacts of packaging

At all stages of the life cycle there are **environmental impacts**. Standard 41.6.8 talks about the direct and indirect environmental impacts of your packaging. By **direct** impacts we mean the effects caused by the packaging, such as the impact on the environment of using natural resources, or the burden of waste created if the packaging ends up in a landfill site. **Indirect** environmental impacts are the less obvious consequences of using packaging, such as greenhouse gas emissions during manufacture of the materials, or the energy used in transporting the packaging throughout the supply chain.

If you do not consider these impacts at every stage of the **life cycle** of your packaging, you cannot fully understand its environmental implications. For example, if you only consider the direct impact of the packaging when it is thrown away, you miss out the indirect impacts it has when it is manufactured and used. By considering the whole life cycle, and looking at the bigger environmental picture, you will be better informed and able to choose packaging that is as environmentally responsible as possible.

Figure 3 A simplified packaging life cycle



There are environmental impacts at each stage of the packaging life cycle. They can include:

- use of finite, **non-renewable resources**, such as oil
- use of **natural resources**, such as trees and water
- **energy** use, such as in manufacture and transport
- **emissions** to air, such as gases which contribute to climate change
- **discharges** into water, which can be toxic to plants and animals
- creation of **waste by-products** including hazardous substances, ash and leachate
- impacts on natural **habitats**, for example through extractive industries and landfill sites
- impacts on the **amenity** value of landscapes, for example through transport pollution and littering

5.3 Balancing primary, secondary and tertiary packaging

Soil Association standard 41.6.8 requires you to minimise the amount of materials you use. One of the areas to consider is whether you have achieved the **best balance** between primary, secondary and tertiary packaging. It is important to take this system view because changes to primary (retail) packaging can have a knock-on effect on secondary (grouping/display) and tertiary (transport) packaging. For instance, if you reduce the size of the primary packaging on a product, more may fit in the box used to group those products for transport. This would mean you use less secondary packaging and that more products can be transported in a single journey.

Changes you make in one area of your packaging should not have a **negative effect on other packaging**. For example, if you reduce the amount of primary packaging too far, you could have to use more secondary and tertiary packaging to protect the product during transport. This could mean that overall you may actually be increasing the total amount of materials you are using.

As well as size, you should also think about the **shape** and **weight** of your packaging. If you change the design of the packaging, for example by designing it so that products stack together, you might be able to fit more into each container used for transport.

It is important to consider **weight** when specifying packaging. Heavier materials will use more raw materials and need more fuel energy when they are being transported. The **distances your packaging travels**, both full and empty, is also an important aspect to consider. Sourcing your packaging near to where it is filled or packed will reduce the number of miles it must travel and therefore its environmental impact. Transporting empty packaging uses fossil fuels and adds to traffic volumes and emissions to the environment. You may be able to source a suitable alternative closer to home and it could even save you money.

Case study | Daylesford Organic

For their organic milk, Daylesford Organic have chosen an innovative solution that takes into account the whole life cycle of the packaging. They have moved away from the traditional formats for milk containers and are using a lightweight pouch made mainly from chalk.

Stuart Gates, Director and General Manager at Daylesford explains their choice: *"In choosing the Ecolean® packaging system, the main consideration was its environmental impact, although it also contributes positively to product quality. We considered using glass for its reusability and aesthetic appeal, but this would have limited sales as very few retailers will sell milk in glass anymore."*

"Most people think of what to do with packaging after it's been made, but this misses important issues. The environmental impact of the pouches we use is lessened throughout the lifecycle of the packs."

According to the manufacturers, the pouch material uses less energy and resources in its production than conventional plastic, causes less air and water pollution, and creates fewer waste by-products. Best of all, the packs are extremely light and flatten completely when empty. This means that an order of 100,000 units will fit on a single pallet. This not only cuts down on transport, but it saves valuable storage space. It also means that the pouches take up very little space when they become waste.

GEORGE BAMFORD

Case studies are for illustrative purposes only. They are not recommendations of one type of material, packaging system, or product.

6 Minimising the environmental impacts of packaging

To minimise the environmental impacts of your packaging, there are key issues that you need to consider, whatever material you use. Not all the guidance here will be applicable to your packaging and some of the points may not currently be achievable for you. It is intended as guidance for best practice.

Your first priority is to make sure that your packaging is **fit for its purpose** (standard 41.6.6). Minimising packaging must not be at the expense of protecting your product. There is often a delicate balance between minimising the environmental impacts of packaging and minimising food spoilage or product damage. Keeping an eye on your levels of damaged or returned product can help you gauge if your packaging is performing its protective function.

Information on best practice for specific materials is given in Chapter 7.

6.1 Minimising the amount of material you use

The main aim in waste minimisation is to **reduce packaging at source**. Soil Association standard 41.6.8 requires you to do this. It is also an obligation under the Essential Requirements Regulations, which are legally enforceable.

Chapter 3 has information on packaging legislation.

This does not mean giving preference to one material over another (e.g. plastic over glass) or that certain packaging systems are better (e.g. single use versus reusable). You should consider the **overall environmental impact** of the packaging system.

Chapter 5 has information on the packaging life cycle

You should also refer to the other sections in this chapter.

To minimise the amount of material you use, you should:

- **reduce the thickness** and **weight** of materials. Your supplier might have a new or different design, or you could use a lighter material that performs just as well
- **eliminate unnecessary layers** of packaging. Consider the function of every piece of the packaging – assess if all parts are really necessary. For example a bag may not need to also be boxed
- **sell produce loose**, labelled with small stickers to identify it as organic, although you do need to be aware of the regulations covering this

There is a Soil Association Guidance Note on the sale of loose organic products. You can request it by email to proc.cert@soilassociation.org or call 0117 914 2407

- **reduce empty spaces** in containers by matching the size and shape of the container to the contents. Empty spaces can reduce the strength of the packaging and its ability to protect your product. Using the right size box also reduces the need for **fillers or packing materials**
- **print directly** on to primary packaging to avoid the need for separate labels
- minimise the use of **fillers and packing materials**. Only use what is necessary to protect products in transit
- offer a **range of sizes** of your product. This encourages customers to only buy what they need or to buy in bulk, which means less packaging is used. It can also help reduce food waste
- avoid **plastic film windows**. They complicate recycling and could be substituted with a product image or a cut out window
- avoid hollow, **double-walled containers**, unless they are specifically needed for insulation or protection. This is important in minimising packaging but also because double-walled containers can mislead consumers as to how much product they are buying

Case study | Duchy Originals

Duchy Originals have shown how working with a supplier to make small changes to a pack can lead to big savings.

To minimise the amount of material used, they have reduced the size of the glue flaps on their biscuit cartons and are now using thinner card. The changes mean that overall, 9 tonnes of cardboard will be saved each year.

"By working with our biscuit maker, Walker's Shortbread" explains Tim Appleton, Duchy's technical manager, "we have made significant weight savings through relatively small changes to the closure of our biscuit cartons, but without changing the appearance of the packs. Keeping the look and feel of the pack was really important as the design has been very popular with our customers. It took us a few attempts before we got the changes right. In the trials, if we reduced the flap too much, the boxes didn't close properly on the packing line."

Transit tests confirmed that the changes would not affect the strength of the packs. The new packaging has been well received by customers.

Duchy Originals are now planning to replicate this work across other products in their range, *"This was a positive experience for us and something we feel we will gain from as a company"* says Tim.

Walker's are so impressed with the results, that they are now looking to minimise packaging across their own range of products.

Case studies are for illustrative purposes only. They are not recommendations of one type of material, packaging system, or product.

- make packaging just **adequate to withstand one trip** if it's not going to be reused. Consider and test your packaging to ensure it's not more robust than it needs to be
- **print information inside** packaging to avoid having a separate leaflet in the pack
- store packaging in **clean, dry and hygienic conditions** to reduce the risk of damage and wastage (standard 41.6.7)
- **train staff** and raise awareness about the benefits of properly using and handling packaging
- **involve staff** who are responsible for using packaging – they are often best placed to highlight areas of wastage and to suggest improvements
- **improve product handling** through staff training or better systems. This can reduce the risk of product damage and reduce the need for protective packaging
- find the best **balance between** primary, secondary and transport packaging

Chapter 5 has information on this

- work with your **supplier**. The packaging industry is constantly innovating materials, designs and manufacturing processes. This may present you with new minimisation opportunities. Your supplier may be able to review your packaging with you and offer alternatives or improvements to the design.

6.2 Reusable packaging

Standard 41.6.8 requires you to maximise the amount of material that can be reused. This is also covered by the **Essential Requirements** Regulations

Chapter 3 has information on packaging legislation

It is not always feasible, but reusing packaging can be beneficial from both an environmental and economic point of view. It can mean using fewer raw materials, less packaging going to landfill as waste or being incinerated, and no energy being used for recycling. The more times packaging is properly reused, the greater the benefit

Reusable packaging needs to be robust. However, you still need to minimise the materials it is made from and consider what will happen at the end of its life. Energy and resources will still be used in its manufacture, transport, cleaning between uses, and eventual disposal.

You should also refer to the other sections in this chapter.

Points to consider for reusable packaging:

- all packaging must be **clean** and **free of contamination**. Check that containers are in good repair before reusing them (standard 41.6.13)
- if previously used for non-organic products, **clean containers** thoroughly so that no residues remain (standard 41.6.13)
- **closed-loop** systems (reusing packaging for the same purpose) with **short transport distances** are best
- bringing back empty packaging on the **return journey** after goods have been delivered is most efficient. It is important to consider the environmental implications of an increased number of journeys if packaging is being returned, for example, by courier or if it requires a specific journey
- use **durable but lightweight** containers. For example, corrugated board or plastic pallets and crates can be good alternatives to solid plastic or wooden crates
- **adaptable** and **repairable** containers are best. Different liners can be used with standard boxes to accommodate various products and containers can be modular to allow for easy replacement and recycling of worn out pieces
- containers should be **easy to open, re-close and secure**, without risk of injury or damage to the packaging
- design boxes and containers so they are **easy to empty, clean** and **refill**, for example with smooth surfaces and no hard-to-reach corners, so that little residue is left at the end of use
- keep in mind the amount of resources (**energy** for heating, **water**, **detergents** and **time**) that are used in preparing containers for re-use
- **collapsible** or **stackable** containers are easier to store and return. If containers take up less space, fewer journeys may be needed to return them to you – this reduces fuel use (and cuts costs)
- **standardise** your packaging as much as possible, to make a re-use system easier but bear in mind that you also need to ensure that packaging is minimal for the product
- use **easy-to-remove labels** which help to minimise aesthetic damage

- if transport packaging is only **superficially damaged**, it may still be possible to reuse it. Do not reuse packaging if there is any risk that it has lost its strength
- be aware of the negative impacts of damaged packaging on **consumer attitudeses**
- give customers, and staff, plenty of **information** about your reuse system and make return instructions clear
- **monitor** your reuse system to ensure that packaging is actually being returned and reused as planned
- you could **reuse packaging you receive** from your suppliers (such as boxes and fillers) if it is the appropriate size and shape.

6.3 Recyclable packaging

Standard 41.6.8 requires you to maximise the amount of material that can be recycled. Recovery through recycling is covered by the **Essential Requirements** Regulations.

Chapter 3 has information on packaging legislation

Recycling prevents waste from ending up in landfill sites and reduces the extraction and use of raw materials. It can also mean using **less energy** and therefore producing **lower emissions** of carbon dioxide and other greenhouse gases. For example, less energy is needed in a furnace to recycle used glass than is needed to turn raw materials into glass.

Even if you design your packaging to be recyclable, you need to consider the type and amount of material you use, and its final disposal. A lot of resources and energy will still be used in its manufacture and even though the packaging may be recyclable, this does not mean that it will be. The necessary facilities may not be widely available, or consumers may simply opt not to recycle it

You should also refer to the other sections in this chapter.

Points to consider for making packaging more recyclable:

- make packaging from a **single type of material**
- **separating components** should be made as easy as possible if more than one material is used, such as a plastic closure on a cardboard box
- avoid **mixing plastic** types

- **unpigmented**, **clear** and **unprinted** materials are the most economically attractive for recycling. They are easier to reprocess and the end result is more useful

- **polyethylene**, **foils** or **adhesives** in some types of laminated board can cause problems at reprocessing mills. If you cannot avoid laminates, minimise the amount you use

- clearly mark packaging to show the **type of material** used. This will help consumers separate materials for recycling.

There is more information on this in Chapter 9

- **PET** (polyethylene terephthalate) and **HDPE** (high-density polyethylene) are currently the most commonly collected and recycled plastics in the UK

- **encourage consumers to recycle** your packaging where possible. For example, recommend www.recyclenow.com which helps consumers find their local recycling facilities.

There is more information on this in chapter 9

Case study | Yeo Valley Organics

Yeo Valley Organic believe that an important feature of organic farming is that the people raising animals and crops really do care about the environment. As part of this, Yeo Valley do everything they can to make their packaging easy to recycle and minimise its impact on the environment.

Yeo Valley director Graham Keating, says: *"We are always studying new developments in production, looking for ways that we can become more efficient and trying to design packaging that uses the minimum amount of energy to produce and can be simply recycled.*

"Our environmental responsibilities don't end as our products leave our warehouse. Our customers must deal with the packaging after they have enjoyed the product, so minimising the environmental impact of the packaging through good design is one thing, but we also have a duty to inform and encourage the consumer to recycle where they can."

The innovative two-piece packaging for the Yeo Valley Organic range allows the inner polypropylene pot to be made from the thinnest grade necessary to ensure the yogurts reach customers in perfect condition. Additional strength is provided by an outer sleeve made from recycled card that is not coated or bleached. The card is perforated so customers can easily separate the two parts for recycling.

Information printed on the inside encourages consumers to remove the outer card after eating the yogurt and the fact that it can be recycled with paper or in a compost bin is highlighted. Consumers are also directed to a website which allows them to find the nearest recycling point for the plastic inner pot.

Case studies are for illustrative purposes only. They are not recommendations of one type of material, packaging system, or product.

6.4 Using material with recycled content

Standard 41.6.8 requires you to use materials with recycled content where possible.

Packaging materials that include recycled content reduce the amount of **raw materials** and energy being used to make packaging, help to create **markets** for waste products, and can **reduce disposal costs**.

Recycled materials are sometimes regarded with suspicion because of poor or inconsistent quality in the past and because of concerns about **contamination**. This is no longer the case – the standard of recycled materials has improved significantly. Glass, metal and most board packaging has contained some recycled material for many years. So, you might be using recycled materials without even knowing it.

Regulations require that packaging materials must not transfer harmful substances to food. Recycled materials used for packaging food and drink undergo a **'super-clean process'** to remove any risk of contamination. Contrary to common misperception, this means that **recycled plastic can be used for packaging, even where it is in contact with food**. Recycled materials can also be incorporated into packaging through co-extrusion or laminating.

There is more information on this in chapter 7.

Points to consider with recycled content:

- recycled content **closes the recycling loop**. It creates markets for recycled waste and helps the UK to achieve its packaging recovery targets
- recycled materials can be used for **primary food packaging**

There is information about this above and in chapter 7

- ensure your packaging is **certified for food contact** and conforms to food contact legislation and traceability requirements
- even if they are recycled, clearly **identify the materials** you use. This helps with separation and collection of packaging waste for further recycling

There is more information on identifying materials in chapter 9.

- recycled materials may need to be **slightly heavier** to perform as well as virgin materials.

6.5 Materials from sustainable sources

If you use renewable materials, they should be from sustainable sources (standard 41.6.10). This applies mainly to packaging made from cardboard, paper or wood, but it can also apply to packaging made from crops such as cotton and plant-based biodegradable materials.

When **renewable resources**, such as trees and water, are consumed faster than they are replenished, **environmental degradation** occurs. This means their use is not sustainable.

Forests are an essential natural resource. They filter our air and water, reduce soil erosion and landslides, and act as a buffer against climate change. Many endangered animals depend on forests for their survival.

As rates of consumption increase, many renewable materials are being used faster than they can be replenished, or are being extracted in ways that are damaging the environment. **Illegal and unsustainable logging** are taking a heavy toll on forests and their people. The illegal logging trade is a major problem for timber-producing countries in the developing world. It causes environmental damage and has many negative socio-economic impacts.

Intensive production of other crops can also cause environmental degradation. Cotton production has a major impact on freshwater resources and negative consequences for nature and humankind. Clearing land for use for crops, the water needed for irrigation, chemical inputs, and high-energy use, all take their toll. Cotton production uses a significant proportion of the world's synthetic agrochemicals which can cause a range of environmental and health problems.

It is important that we manage our use of renewable resources sensitively and pay proper regard to how the materials we use affect natural habitats and biodiversity.

Points to consider when sourcing renewable materials:

- get written **confirmation/proof from your suppliers** that materials used in your packaging are from sustainable sources
- find out **information** about the origin of the raw material (for example, back to forest level if possible), the species used, the volume or value of the material and if the product has a certified status
- do not use materials from **'controversial sources'** – a term used to describe areas where high conservation values are threatened, where traditional or civil rights are violated, genetic modification of the material has taken place, where materials are illegally harvested or natural forest has been converted to plantations or non-forest use
- choose cardboard, paper or wood, which is **certified by a third party** (such as the Forest Stewardship Council (FSC)) as being from a sustainable source. This will help you verify where the material is from
- choose wood products from **recycled** or **reclaimed sources**. FSC has an independent third party verification scheme for recycled wood materials
- choose cotton or hemp that is **certified organic**. This greatly reduces damage to the environment and human health during production and processing. Chemicals that harm wildlife or are suspected to damage human health are banned under Soil Association standards. Allergens and genetically modified fibres are not permitted.

7 Materials: guidance for best practice

Before selecting your packaging material(s), you should consider the **life cycle** of your packaging and the **functions** it needs to fulfil. You will have to weigh up the relative merits, including costs, of the different materials available to you.

Chapters 5 and 6 have information on this

This chapter recommends **best practice** in the material(s) you choose. It is intended to help you minimise the amount of material you are using and increase re-usability and recyclability. Not all the guidance will be applicable to your packaging and you may not currently be able to achieve some of the points.

7.1 Glass

Glass produced in the EU almost always contains some recycled material (cullet). It is strong and durable and can be recycled many times without losing strength. However, glass can be heavier than its alternatives, which may mean more energy is used to transport it.

Glass used for packaging is made primarily from silica (derived from sand) and simple minerals. Most glass for bottles, jars and other containers is known as commercial glass or soda lime glass, as soda ash is used in its manufacture. Commercial glass is normally colourless. Chemicals are added to produce different colours such as green, blue or brown (amber).

There is a well-established infrastructure in the UK, for collecting and recycling glass containers.

Heat-resistant borosilicate glass, better known as 'Pyrex', may also be used in packaging, mainly for food that is cooked or re-heated at home. It is not suitable for recycling.

Points to consider when selecting and using glass:

- you must **minimise the amount of materia**l you are using and maximise the amount that can be **reused** or **recycled** (standard 41.6.8)

Chapter 6 has information on this

- you must use glass with **recycled content** where possible (standard 41.6.8)

Chapter 6 has information on this

- if you use British-made glass, use **green** or **brown**. This will help to use the abundant, and relatively cheap, supply of glass waste present in the UK from imported wine bottles
- specify **clear glass** wherever possible if you import products packaged in glass
- use **coatings** or **overprinting** to provide the required colour, image and information. Most coatings will burn off easily or be removed during the recycling process, and are less of a problem to recycling than shrink wraps and extra labels
- packaging made from glass can be easily **sterilised**, reducing the need for product preservatives
- glass is **inert**, and will not transfer any chemicals into products, and provides an excellent **moisture** and **gas barrier**
- packaging made from glass can be used to process foods at **high temperatures**, or for **hot filling**
- glass containers can be **washed** and **re-used** after the content is finished if they are designed for reuse. Ensure that containers are still fit to use. Check, for example, that they have not been used to contain potentially dangerous substances
- **thoroughly test** thinner/lighter weight glass packaging before introducing it to prevent any product loss through damage.

7.2 Plastics

Plastics can make tough, durable and flexible packaging. They are lightweight and versatile and can be formed into an infinite variety of designs and colours. Although usually made from non-renewable oil resources, plastic packaging can be both recycled and made using recycled material.

Many different types of plastics are used for packaging. Most are derived from petroleum, although new materials are becoming available – such as plastics made from a combination of **calcium carbonates** (chalk) with small amounts of plastic used as binding agents. These may have a lower overall environmental impact compared to conventional plastic materials. The cost of plastic is related to the **cost and availability of oil**, so if oil prices continue to rise, the cost of plastic will rise too.

Chapter 9 has information on identifying plastics.

It is possible to combine layers of plastic, for rigid packaging by **co-extrusion**, or by **lamination** in the case of plastic films. This allows the packaging to protect the product but minimises weight. Recycled content can be incorporated into packaging through these methods, without affecting its aesthetic appeal.

Using co-extruded and laminated materials may also provide barrier properties. This could reduce the need for additives and preservatives and improve the product's freshness and shelf life.

Co-extrusion of rigid plastics and films provides a material made of several layers:

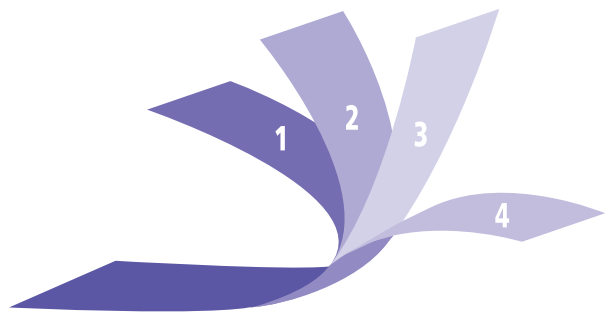
1 a thin outer layer, visible to the consumer, made from virgin material

2 a thin, coloured layer, if the packaging needs light-barrier properties

3 a core layer that provides most of the strength and can be made from recycled plastic, and

4 a thin layer that is in contact with the product.

Figure 4 The composition of co-extruded plastics



Adapted from Envirowise

Three-layer, co-extruded plastics are more common as layers 1 and 2 are not usually both needed.

It is possible to use **recycled plastics** in food and drink packaging. These materials undergo a 'super-clean process' to remove any risk of contamination. Contrary to common misperception, this means that **recycled plastic can be used for packaging, even where it is in contact with food**.

Chapter 6 has information about using materials with recycled content.

Points to consider when selecting and using plastics:

- you must minimise the amount of material you are using and maximise the amount that can be reused or recycled (standard 41.6.8)

Chapter 6 has information on this

- you must use plastic with recycled content where possible (standard 41.6.8)

Chapter 6 has information on this

- the use of PVC (material with material identification code number 3) is not permitted under Soil Association organic standards (41.6.12)
- consider using **co-extruded packaging**, which enables recycled content to be incorporated
- avoid packaging made from **different types of plastic**. It can be difficult or impossible to separate them for recycling
- **pigments** used to colour plastics can have an adverse effect on **recycling**, and can be difficult or impossible to fully remove – consider using clear or white plastics
- not all **plastics** are currently collected by recycling schemes in the UK due to **low market value** or high **volume to weight ratios**. **PET** (polyethylene terephthalate) and **HDPE** (high-density polyethylene) are currently the most commonly collected and recycled plastics in the UK.

7.3 Paper and Board

Paper and board are produced from renewable and recyclable natural resources and are biodegradable under the right conditions. They are very versatile and come in many weights and grades. They can be relatively inexpensive and can have a good printing surface for graphics. Where virgin paper and board is used, you should make sure that it is from a sustainable source.

Paper

Paper is made from cellulose fibre, which is usually derived from pulped wood and/ or recovered paper. It is occasionally made from other renewable materials such as cotton, grasses, sugar cane, or straw.

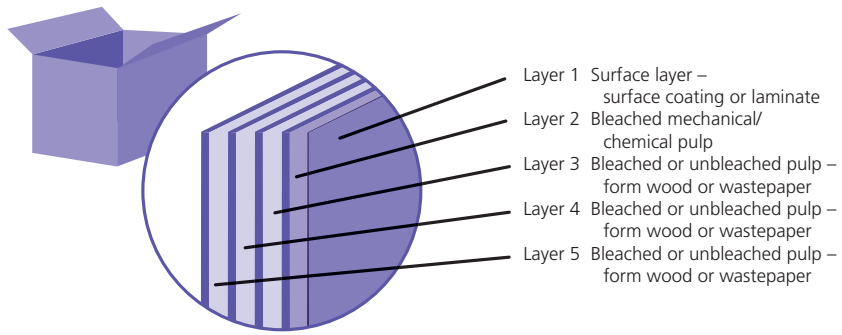
When used paper is collected for recycling, it is known as **recovered paper**. Paper cannot be recycled indefinitely because the fibres get shorter and weaker each time they are recycled. Some virgin material must be introduced into the process to maintain the strength and quality of the fibre.

Cartonboard

Plain paperboard (**cartonboard**) is used widely in packaging. It usually consists of four or five layers of pulp, plus an outer coating to provide a smooth finish for printing (see Figure 5). This surface finish often uses clays, varnishes and, sometimes, plastic laminates.

Bleached pulps tend to be used for packaging 'luxury' items, and where there might be food contact. This type of cartonboard is called **solid bleached board (SBB)** or **folding boxboard (FBB)**. Cartonboard made from waste paper is called **white lined chipboard (WLC)**.

Figure 5 The composition of cartonboard



Adapted from Envirowise

Corrugated board

Corrugated board is very versatile. It has **built-in strength** from the corrugations or 'fluting' between the board's layers. It comes in various forms, from very strong triple-walled board that can be used as part of pallet systems, through to the single and double-walled designs used in regular boxes, to micro-fluted material which has a **smooth surface** suitable for printing.

Designs using internal folds and partitions can protect products and can eliminate the need for fillers and cushioning. Internal corrugated partitions can also improve overall pack strength.

The outer surface of corrugated board can be made from virgin **kraft**, or more usually **test liner** – which is composed of recycled fibres. This can be brown, bleached white for printing, or a combination of white on the outside and brown inside.

Board that will be in contact with food should be tested for **metal contamination**. Corrugated packaging will typically contain trace amounts of metal contaminants. Where food products are packaged, hygiene and quality control of processes and procedures can be guaranteed through the British Retail Consortium and Institute of Packaging (BRC-IoP) standard.

Bleaching

Bleaching paper with chlorine and chlorine dioxide emits dioxin and other organochlorides into air and water. If these toxins enter the food chain, they can accumulate in the fat cells of animals. Studies have shown that dioxins are highly carcinogenic, may lead to reduced reproductivity and can cause genetic damage. They accumulate in the environment, becoming more concentrated further up the food chain.

If you use bleached paper or board, it must be from a **Totally Chlorine Free** (TCF) process (standard 41.6.11). This is a form of pulp bleaching which avoids the use of chlorine-based compounds, including chlorine gas and chlorine dioxide. Oxygen, ozone and hydrogen peroxide are some of the alternatives used.

TCF should not be confused with the similarly named **Elemental Chlorine Free** (ECF). ECF paper is bleached with chlorine compounds (chlorine dioxide) but it does not use chlorine in its elemental form (chlorine gas), hence the name Elemental Chlorine Free.

The technology behind TCF bleaching has advanced significantly in recent years, and can provide a bright white appearance to paper and board used in packaging.

Recycled paper or board must be **Process Chlorine Free** (PCF) (standard 41.6.11). This ensures that recycled fibres have not been re-bleached with chlorine or chlorine compounds. This is sometimes also referred to as Secondarily Chlorine Free.

Points to consider when selecting and using paper and board:

- you must **minimise the amount of material** you are using and maximise the amount that can **be reused** or **recycled** (standard 41.6.8)

Chapter 6 has information on this

- you must use paper or board with **recycled content** where possible (standard 41.6.8)

Chapter 6 has information on this

- avoid mixing paper and board with **other materials**. This helps to increase recyclability
- board with a **high recycled content** may need to be slightly thicker if it is to perform as well as virgin fibre board
- use products from **sustainable sources**, preferably those with certification from a registered system such as the Forest Stewardship Council (FSC) or the Programme for the Endorsement of Forest Certification (PEFC)

Chapter 6 has information on this

- a reputable manufacturer should be able to verify complete **traceability** from the forest to the final production of the materials
- **bleached paper** or cardboard must be Totally Chlorine Free (TCF) (standard 41.6.11)
- **recycled paper** must be Process Chlorine Free (PCF) (standard 41.6.11)
- **mechanical locking** can be used instead of adhesives or staples, and improves recyclability.

7.4 Biodegradable, compostable and degradable materials

Biodegradable packaging is increasingly common and often looks and feels the same as conventional plastic. It can be made from renewable materials that break down after use. You must clearly label these types of materials to help consumers dispose of them correctly. Some of these materials may be derived from intensively produced crops grown specifically for the purpose. The use of genetically modified organisms is of particular concern.

It is important to understand the differences between **biodegradable** and **degradable materials**, and the conditions a material requires for **composting**.

Biodegradable materials can be broken down by microbial activity. A material is deemed biodegradable if it degrades to a specific extent, in a given time, under specific conditions. Biodegradable packaging, sometimes known as **bio-plastic**, can be made from a variety of renewable resources such as starch, cellulose and other polysaccharides, lactic acid, proteins, plant fibres, and plant oils. These are often referred to by the name of the polymer, such as polylactic acid (PLA).

The use of **genetically modified organisms** (GMOs) is an issue with biodegradable packaging. Many of these materials are derived from intensively grown, genetically modified crops from North America. Some materials use genetically engineered enzymes during manufacture. The Soil Association believes that GMOs do not fit with the principles of organic agriculture as they pose potential risks to the environment and human health. Once released into the environment, they cannot be recalled.

GM free bio-plastics are available. You must get proof from your supplier that your packaging does not use materials or substances that contain, have been derived from, or manufactured using, genetically modified organisms or genetically engineered enzymes (standard 41.6.12).

'Degradable' or **'oxo-degradable'** materials are distinct from biodegradable materials. They are made by adding a small amount of a heavy metal compound into a polymer base of polypropylene or polyethylene. The **additives** work to break down the plastic. Degradation is usually dependent on the material being exposed to light, heat or water. The timescale for disintegration can be controlled to ensure the material retains its integrity for its planned useful life. Degradable materials are not suitable for composting.

To be classed as **compostable**, a material has to biodegrade in a composting system under standard test methods. **Not all materials can be composted at home**. Some require the high temperatures, over an extended period of time, that are only possible in commercial composting systems.

The requirements for packaging recoverable through composting and biodegradation are covered by **European standard EN13432**. This is not an indicator that a material is suitable for home composting. You must ensure that any compostable or biodegradable materials that you use conform to EN13432. (standard 41.6.15).

The **Composting Association** has launched the UK's first certification scheme for compostable packaging. To achieve certification and use the certified logo (left), materials and additives are tested for heavy metals, complete disintegration and toxicity to plants.

Commercial composting is developing in the UK but in the medium term most biodegradable packaging is likely to end up in landfill. Once in the anaerobic (without oxygen) environment of a landfill site, the degradation of these materials produces carbon dioxide and methane – **powerful greenhouse gases**.

It is often impossible to tell biodegradable, degradable and compostable materials from conventional materials; so **clear labelling** is vital to guide consumers as to how to dispose of them correctly. This helps ensure that they are actually being diverted from landfill, **prevents contamination** of the recycling stream, and avoids **disappointing consumers** when materials do not compost at home (standard 41.6.15).

You should also **clearly indicate whether the packaging can be composted at home** or if it needs a commercial-scale facility. If not all parts are compostable, you should indicate which components are. For example, you could place on the packaging:

- 'this carton is home compostable'
- 'the tray and film are commercially compostable'

Case Study | Organic Farm Foods

Organic Farm Foods Ltd are suppliers of organic fresh produce in the UK. Much of this produce is supplied to the multiple retailers. Their Local Farm Series displays details of the grower and is packaged in biodegradable, compostable, GM free packaging.

Over many years, Organic Farm Foods have worked closely with their suppliers Compak Packaging in developing fully compostable, biodegradable packaging including labels, films, punnets and bags. Produce such as carrots and leeks are displayed in supermarkets in the specially designed bags.

The bags are made from completely GM free potato starch, sourced from Europe and are fully biodegradable. The packaging conforms to the European Standard EN 13432 for composting. This ensures that it composts down in a working composting environment within 12 weeks.

Organic Farm Foods have chosen to use these bags to reduce the amount of packaging going to landfill and to create something useful at the same time – good working compost.

Peter Segger OBE, Chairman of Organic Farm Foods says: *"We have long supported the development of packaging which not only reflects our organic commitment and our passion for composting but makes sense under the Packaging Waste Regulations where compostable packaging is treated far more favourably. Perhaps the most satisfying aspect is the genuine support shown by the consumers who have been asking us for a long time to find better alternatives to petroleum based and unsustainable plastics."*

"Of course, we would all like to be able to sell loose organic fresh produce but until that day comes, it is a relief to know when we now pop the used bags into our compost piles it not only improves our soils but also reduces the need to increase landfill sites further."

Case studies are for illustrative purposes only. They are not recommendations of one type of material, packaging system, or product.

Points to consider when selecting and using biodegradable, compostable or degradable materials:

- you must **minimise the amount of material** you are using and maximise the amount that can be **reused** or **recycled** (standard 41.6.8)

Chapter 6 has information on this

- agricultural **waste materials** such as those from maize, palm and sugar production and recycled materials can be used to make compostable or biodegradable packaging. This is preferable over crops grown specifically to make packaging materials

Chapter 6 has information on this

- you must ensure that your packaging does not use materials or substances that contain, have been derived from, or manufactured using, **genetically modified organisms** or genetically engineered enzymes. You must get confirmation in writing from your supplier (standard 41.6.12)
- **label** the packaging very clearly as biodegradable or compostable and state **under what conditions** this will take place (standard 41.6.15)
- **starch based** materials are generally suitable for home composting
- materials made from **lactic acid** such as PLA usually need commercial composting conditions to fully degrade
- **additives** in degradable packaging must not exceed **legally permitted limits**

Chapter 3 has information on legal requirements for packaging

- **confirm** with your supplier that all biodegradable and compostable packaging meets the **European standard EN13432** (standard 41.6.15).

7.5 Metals

Packaging made from steel or aluminium contains a significant amount of recycled scrap material. The infrastructure for recycling metals is well established in the UK. Steel and aluminium have a high market value, and can be recycled many times without loss of quality. Metal packaging is strong yet light, and can protect contents using a small amount of material. However, the mining of raw materials and the fabrication of metal require large amounts of energy, and produce emissions to air, land and water.

Food and drinks cans are constructed from either **aluminium** or **steel**. Most food cans are made from steel with a thin coating of tin (tinplate) that protects the surface of the can. This is why steel cans are often called 'tins'. Life cycle analyses comparing aluminium and steel have not reached a clear conclusion on which is better environmentally.

Metals may remain usable through **recycling** for many years. This means less environmental impact from producing the materials, as fewer raw materials, such as bauxite, need to be extracted. Once collected for recycling, steel and aluminium are readily separated using magnets – steel is magnetic, aluminium is not.

Points to consider when selecting and using metal packaging:

- you must **minimise the amount of material** you are using and maximise the amount that can be **reused** or **recycled** (standard 41.6.8)

Chapter 6 has information on this

- you must use metals with **recycled content** where possible (standard 41.6.8)

Chapter 6 has information on this

- if you are packaging food that is **acidic** (with a pH level less than or equal to 4.5) or **salty** (containing more than 2% salt) and you use aluminium foils, they **must** be lacquered (standard 41.6.12)
- unlacquered aluminium foils may be used, but **only** where the food is **neither acidic nor salty** (standard 41.6.12)
- ribbed steel cans are **lighter** and **stronger** than conventional steel cans
- aluminium is **light**, but extremely strong and durable

- **internal coatings** (lacquers) normally need to be used where the metal is in **contact with food** in order to prevent corrosion. Uncoated cans may be used for some foodstuffs such as dry powders and some fruits

- food **stored** in steel cans should have a long shelf life, 3–5 years is quite common.

7.6 Composite materials

Composite materials are lightweight and made from small amounts of raw materials. They can require less energy to produce and transport when compared to other forms of packaging, and can have excellent barrier properties. However, they are usually made from virgin materials and it can be extremely difficult, if not impossible, to separate composite materials for recycling. Where they are recycled, the recycling rates are currently very low.

Composite packaging is made of more than one material and the materials cannot be separated readily. Composites are multi-layered laminates that consist of dissimilar materials, for example paper cartons laminated with aluminium foil and plastic. Packaging made from assembled components of different materials which can be separated, for example a wine bottle that consists of the bottle, a cork and a label, is not composite packaging but **multi-material packaging**.

Cartonboard laminated with polyethylene can offer very good moisture resistance for liquid products such as milk. Aluminium foils together with polyethylene are also used in cartons to extend shelf life.

Despite the current lack of a strong infrastructure for recycling them, composites can be a good lightweight option for packaging because they use such small amounts of materials.

When selecting and using composite materials:

- you must **minimise the amount of material** you are using and maximise the amount that can be **reused** or **recycled** (standard 41.6.8)

Chapter 6 has information on this

- you must use paper or board with **recycled content** where possible (standard 41.6.8)

Chapter 6 has information on this

- use composites that can be more readily **separated** to increase the likelihood of **recycling** the component materials

- **starch-based** and **water-based lattice coatings** can have less environmental impact as laminates than foils and plastics, and can be used for food contact

- **virgin materials** should be from certified sustainable sources

Chapter 6 has information on this

7.7 Adhesives and labels

Adhesives can cause problems during recycling. Some adhesives are difficult to remove and can leave traces or blemishes on products made from recycled material. Pressure sensitive and cold-seal adhesives are generally the most difficult to remove.

Water-based adhesives (such as polyvinyl acetates, PVA) and **hot melt** adhesives (those applied in a molten state, which cool to form a solid bond between the two layers) have also proved to be difficult to deal with during recycling because they break up and have a similar density to water and paper fibre. This makes them difficult to remove through normal separation methods.

When thinking about labels on packaging, you should also refer to section 7.9 on inks

When selecting and using adhesives and labels:

- you must **minimise the amount of material** you are using and maximise the amount that can be **reused** or **recycled** (standard 41.6.8)

Chapter 6 has information on this

- use **food-grade labels** with **edible inks** that can be applied directly onto products such as bread

- **print directly** onto containers to minimise the use of labels or use the smallest label necessary

- **print inside** packaging if you need to provide a lot of information

- **minimise the amount of adhesive** used to hold a label in place. Using more than necessary wastes resources and makes removal harder

- thin strips of **hot-melt adhesives** can cause more problems than thick beads, as they more readily fragment into pieces. Newer ethylene vinyl acetate (EVA) hot-melt adhesives and fast-drying polyurethane rubber (PUR) adhesives are available. These are tougher and have a higher or lower density than that of water and paper fibre, making them easier to remove from recycled pulp

- **water-based** and **water-soluble adhesives** are still widely used in the UK and do not release volatile organic compounds (VOCs) – but they do generally require more drying energy and compression time than hot-melt adhesives

- consider how easy labels are to remove in the **recycling process**. Soluble adhesives can build up on equipment and become difficult to remove. Most UK paper mills prefer adhesives that can be separated out rather than those which dissolve into the recyclate

- **mechanical fastenings** such as interlocking tabs can be a good alternative to adhesives

- **staples** are not suitable for food packaging and make recycling more difficult.

WRAP has produced a report on the issue of adhesives and recyclability. Although this relates mainly to direct mail, a lot of the issues are very similar for packaging. The report is available online at www.wrap.org.uk

7.8 Coatings and laminates

Coatings, lacquers and laminates are used to enhance a material's **barrier properties** (such as preventing moisture transmission) and to improve the outer **appearance**. Materials commonly used for this are polyethylene, aluminium foil, synthetic waxes and varnishes.

While useful, these types of coatings and laminates can cause problems when **recycling** packaging. Wax coatings can cause problems as the wax can carry through to the final recycled product and builds up on equipment. The difficulty of separating plastic and aluminium laminates reduces the amount of material that can be recovered, and increases the amount of waste from the recycling process.

When selecting and using coatings and laminates:

- you must **minimise the amount of material** you are using and maximise the amount that can be **reused** or **recycled** (standard 41.6.8)

Chapter 6 has information on this

- ensure that all coatings meet the **Essential Requirements** limit for combined heavy metals. In general, European manufacturers no longer use heavy metals, but you should still check

There is more information on legal requirements in Chapter 3

- water-soluble, **starch-based polymeric laminates** or **water-based acrylic lattice coatings** can be used as alternatives to plastic and wax laminates

- **ceramic** or **glass vapour deposition films** can be used as an alternative barrier material to aluminium foils. Films of this kind are now used in some countries for both food and non-food applications. These forms of lamination are readily broken down in the re-pulping process at recycling mills and do not have a detrimental effect on the final recycled product.

7.9 Inks and pigments

As with all materials you use, when selecting inks and pigments you should minimise their environmental impacts.

Water-borne and **ultraviolet-curable** inks can be better environmentally than solvent-borne inks because of their lower **volatile organic compound** (VOC) emissions. However, they do require more drying energy and may slow down flexographic and rotogravure printing processes. **Lithographic** printing techniques are used for most cartonboard printing, where ultraviolet curing can speed up the drying process.

Flexography is the major process used to print packaging materials. It is used to print, for example, corrugated containers, sacks, plastic bags, beverage cartons, disposable cups and adhesive tapes.

Ultraviolet-cured printing is generally acceptable for all types of primary food packaging, as it has low taint and odour, and good adhesion properties.

Water-borne inks are not always suitable for high-specification packaging applications, especially on non-absorbent plastic surfaces, as substances may shrink during the drying stage. Water-borne inks can also be more difficult to remove during

paper recycling, and through re-pulping and de-inking at a paper mill. Despite this, ink contamination is not usually a problem.

Pigments in plastics can be very difficult to remove during reprocessing.

When selecting and using inks and pigments:

- you must **minimise the amount of material** you are using and maximise the amount that can be **reused** or **recycled** (standard 41.6.8)

Chapter 6 has information on this

- ensure that all inks and colour pigments meet the **Essential Requirements** limit for heavy metals. In general, European manufacturers of inks and pigments no longer use heavy metals – but you should still check

Chapter 3 has more information on the Essential Requirements

- any coatings, dyes or printing inks which will come into direct contact with food must not contain **phthalates** (standard 41.6.12)
- use inks with the lowest possible environmental impact. Alternatives to hazardous industrial solvent-borne inks do exist, including **water-borne**, **ultraviolet curable**, **litho** and **vegetable-based inks**
- **limit the amount of graphics** printed on your packaging to minimise the amount of inks you use
- **embossing** can replace the need for printing
- **clear, unpigmented** packaging is preferable to coloured packaging from a recycling point of view
- **light pigments** are preferable to dark ones (if coloured plastics must be used) as they cause less taint in recycling.

8 Mail order and direct sales

Mail order (including internet sales and telephone orders) and other forms of **direct selling** – such as box schemes and farmers' markets – place specific demands on packaging. Perishable goods must be kept chilled and protected from damage in transport. Provision may be required for goods to be returned, or you may be ensuring that your customers can get your product safely home from a market.

Sales direct from the producer to the consumer are the **fastest growing retail sector**. This form of selling presents **excellent opportunities** for minimising packaging such as through bulk orders, reusable transport containers, and fewer presentation materials.

Minimising the amount of packaging you use, while still ensuring your product is adequately protected, can reduce unnecessary **cost**, increase your **profits** and improve your company's **image**. You are also required to minimise packaging under the Essential Requirements regulations. Non-compliance could lead to prosecution.

Chapter 3 has more information on the Essential Requirements

This chapter gives you points to consider when selecting mail order and direct sales packaging. Not all the guidance will be applicable to your packaging and you may not currently be able to achieve some of the points. It is intended as guidance for best practice.

8.1 Mail order

Chapters 5, 6 and 7 of this guide also have tips that may help you

Outer packaging materials

- **match the size** and shape of the box you use to the contents as much as possible – avoid the temptation of 'one size fits all'. Intelligent sizing minimises the **empty spaces** in a box and can reduce the need for fillers and padding
- reduce the **thickness** and **weight** of materials wherever possible
- **strengthen packaging** only in stress areas, such as at corners, to achieve high overall strength using less material
- eliminate **unnecessary packaging layers** to reduce materials and weight
- **train staff** who pack orders to optimise the use of all materials
- keep outer packaging **simple and standardised** if possible – use labels on plain boxes to give maximum flexibility

- **secondary/transit** packaging does not need to be too robust if the primary/ secondary packaging already gives the necessary protection and strength
- all packaging must contain **recycled** material where possible (standard 41.6.8)
- choose packaging **shapes** that maximise case, pallet and transport efficiency, for example rectangular sections and flat tops
- encourage consumers to **return** outer packaging and reuse it, even if there is aesthetic damage (but not if there is any risk that it has lost its strength)
- **reuse** packing materials you receive from your suppliers.

Labelling and closures

- **minimise labelling material** and adhesives so as not to interfere with reuse or recyclability
- reduce the need for labels by using corrugated board with a **smooth printing surface**
- avoid **plastic over wrapping** unless it is absolutely necessary e.g. for waterproofing
- **interlocking** the flaps may close a box adequately if it is not necessary to provide tamper evidence. This improves the likelihood of the box being reused and/or recycled
- staples can reduce recyclability – self sealing, staple free cardboard boxes are available

- adhesive **tape and banding** is often over-used. Optimise the amount you use and only seal openings – the whole box rarely needs to be taped.

Fillers/Padding

- **match the size** and shape of the box you use to the contents. This minimises the **empty spaces** in a box and can reduce the need for fillers and padding like polystyrene chips and bubble-wrap
- rolled, corrugated or off-cut **waste paper** can be used as padding
- **renewable/biodegradable** or non-plastic material fillers are available as alternatives to plastics and expanded foams
- **genetically modified organisms** are used in some expanded wheat/corn based chips – you must confirm with your supplier that materials you use do not contain, or are derived from, GMOs (standard 41.6.12)
- do not use more **cold packs** than necessary, to avoid excess transport weight
- **reuse** packing fillers that you receive from your suppliers.

8.2 Box schemes

Local distribution and regular customers make box schemes an excellent way to minimise packaging.

i Chapters 6 and 7 of this guide also have tips that may help you

i There is a Soil Association technical guide *Setting up an organic box scheme*. It can be ordered online at www.soilassociation.org and click 'information centre' followed by 'library', 'box schemes'.

- box schemes are ideally suited for **reusable packaging**
- give customers **clear instructions** on how to prepare and return packaging for reuse
- make packaging **easy to clean** and repair
- **laminating** or **lining** cardboard boxes can prevent moisture damage and extend their life
- even with a box scheme you should be sure to **match the box size to the contents**, to minimise the materials used and maximise **transport efficiency**

- use foldable or **collapsible boxes** to save space on the return journey and make storage at home easier for customers
- adhesive **labels** can be used on standard boxes meaning you can use the same box for many different purposes
- unless they are soft and need protecting, or in order to meet other regulations, **do not wrap** fruit and vegetables if they are already in another container
- if you try new formats for your packaging, encourage **customer feedback** so you know if it's meeting their needs.

Even if you have a reuse system, you must still minimise the materials you use as much as possible and design for recyclability.

Case study | Sheepdrove Organic Farm

Sheepdrove Farm use returnable cardboard boxes for their mail order meat business. Around 80% of customers freepost the whole box back for reuse. Details of how to do this are written on the box. Each box can be used 2 or 3 times before being recycled. The foam inserts used for insulation can be reused around 20 times.

In the past, all orders were sent out in a standard sized box. The farm has further reduced the amount of packaging it uses by introducing two new sizes of box. A 'chicken box' for orders up to 10kg and a 'mini box' for orders up to 6kg. The original box is now only used for orders over 10kg. With the additional box sizes, the packaging can now more closely match the size of the order which means a lot less packaging is used. Overall, Sheepdrove Farm have reduced the amount of packaging waste by around 7 tonnes a year.

Martyn Smith, production director at Sheepdrove says: *"We're really pleased with the new boxes and our customers are happier with the smaller sizes too. We're now looking at ways to increase the recycled materials we're using and increasing the number of boxes we get back."*

Case studies are for illustrative purposes only. They are not recommendations of one type of material, packaging system, or product.

8.3 Market stalls

Selling your products direct to consumers at markets, fairs, or shows is a good opportunity to minimise packaging.

- if you regularly have a stall at the same market, introduce a **return for reuse** scheme – bottles and jars are ideally suited for this. This can help encourage customer loyalty
- sell your product **loose**, but ensure that it cannot be easily damaged on the way home and that you give consumers adequate information about their purchases
- do not automatically offer a carrier bag. Encourage customers to use their own bag or offer **reusable bags**. You could get cloth bags printed with your logo which customers can use time and again
- do not over-wrap foods when selling from a stall, use only the **minimum materials** you need to protect the product.

9 Informing consumers about your packaging

You should **provide consumers with information** about your packaging, for example, about the materials you use, its purpose, and how they can minimise its environmental impact at the end of its useful life (standard 41.6.17). Any claims you make about the environmental credentials of your packaging must be **clear, truthful** and **accurate** (standard 41.6.16). This chapter provides guidance to help you do this.

There is other information that the law requires you to include on your packaging, such as an ingredient list, the weight of the contents, and the 'best before' date. There are also specific requirements for labelling products produced to Soil Association standards and use of the Soil Association symbol. These are not covered here.

For more information about labelling organic food and use of the symbol, refer to section 40.10 of the standards and the Soil Association's *Practical Guidelines for Labelling Organic Food*. The guidelines are available by searching for 'processor forms' online at www.soilassociation.org/certification

Clear, consumer-oriented information on your packaging about its functions, environmental impacts and its disposal, is good for your **brand image** and helps the public become better informed about packaging and how to dispose of it correctly. Indicating the types of material can enable easier sorting of materials for **recycling**.

You can provide information in the form of symbols or short text. You could also direct consumers to your **website** where you can post more information about your packaging, the reasons why you have chosen to use those materials and whether they can be reused, recycled or composted at home etc. You could also include a reference to **www.recyclenow.com**, which has a search function to help consumers find out about **local recycling facilities**.

9.1 Making environmental claims about packaging

Care should be taken when making claims about the environmental impacts of packaging. Any environmental information, claims and logos on your packaging must be clear, truthful and accurate and conform to Defra's **Green Claims code** (standard 41.6.16).

The Code sets out the standard of information the public can expect about environmental impact claims on products. It is supported by the Confederation of British Industry (CBI), the British Retail Consortium (BRC) and Trading Standards.

The code takes into account the international standard on environmental claims, 'ISO14021: 2000 Environmental Labels'. This international standard, published by the International Organization for Standardization (ISO), also gives detailed guidance on

the use of statements, symbols, descriptions and verification appearing on product labels, packaging or in product literature and advertising.

ℹ A practical guide on how to apply the Green Claims Code is available from Defra. It is available online at www.defra.gov.uk/environment/consumerprod

A green claim on your packaging should be:

✓ **truthful, accurate and able to be substantiated**. Be prepared to give the relevant information to anyone who asks. If it is too confidential to disclose, the claim should not be made

✓ **clear and relevant** to the product in question, and the environmental issues must connect to the product. For example, a fair claim would be to say that 'this paper comprises of 75% post-consumer waste', but it would be misleading to say that it 'contains no tropical hardwood', as this is not used in paper

✓ **explicit about the meaning of any symbol** unless required by law, backed up by regulations or standards, or part of an independent certification scheme. The use by a company of its own 'green' symbol or logo to give some form of reassurance to consumers is potentially misleading

✓ **in plain language** in line with standard definitions.

A green claim should not:

✗ **be vague or ambiguous**. For instance, simply trying to give a good impression about a general concern for the environment. Claims should avoid the vague use of terms such as 'sustainable' and 'green' and avoid linking vague descriptions, such as 'friendly' with words like 'earth' and 'nature'. Symbols of natural objects should not be used unless there is a direct link between the product, the object, and the environmental benefit being claimed

✗ **imply that it commands universal acceptance** if there is doubt or division of opinion over the issue

✗ **imply more than it actually covers** if the claim is only about limited aspects of the product or its production, or if it does not deal with a significant issue for that type of product

✗ **make comparisons** unless this is relevant, clear and specific. For example, it would be wrong to claim that your packaging is 'now even better for the environment' or, 'uses less energy' without further qualification

✗ **imply that a product or service is exceptional** if the claim is based on what is standard practice. For example, it is misleading to claim credit for packaging that does not contain a particular harmful substance, if no packaging of that kind actually contains it, or if it is legally forbidden to contain it

✗ **use language that exaggerates** the advantages of the environmental feature the claim refers to. For example, it is misleading to say 'contains twice the recycled content than before', if the original amount of recycled content was very small

✗ **imply that the packaging or product is endorsed** or certified by another organisation when it has not been. Where a symbol appears on the packaging because the manufacturer of the product has sponsored the organisation whose symbol is used, this should be made clear.

9.2 Correct use of recycling symbols

The Möbius Loop (three flying arrows), is the internationally recognised recycling symbol. Despite its common use, there is widespread misunderstanding of the symbol's exact meaning and its use is not regulated. The symbol is used in many different forms, such as with colours, solid or in outline.

Each arrow represents a stage in the recycling process:

1. separation and collection
2. manufacturing/processing into a new product, and
3. use of the new product by the consumer.

The symbol may apply to the product, the whole packaging, or just parts of it. If there could be any confusion about which it applies to, you should place short explanatory text next to it.

Correct use of the Möbius loop	
	You should only use this symbol to indicate that materials are recyclable. You should not use it to suggest that packaging is made from recycled material. Since theoretically nearly all materials are recyclable, the symbol should be clarified with accompanying text such as '**recyclable, where facilities exist**'. You should provide consumers with any additional information that may help them to correctly separate and recycle the waste (see 9.3).
90% PP	Where the symbol appears with a material identification mark, and a percentage figure in the centre, this indicates the amount of **recycled content** used in the material. It does not necessarily mean it is recyclable. If the percentage of recycled content is variable, it should be labelled as "at least X%" or "greater than X%". The example on the left means "this packaging is made with 90% recycled polypropylene (PP)"

9.3 Identifying materials

Identification codes should be used on packaging to indicate the material used (standard 41.6.17). The codes are mainly used on plastics and metals. The codes can help consumers **sort materials** for recycling.

You must take particular care to label biodegradable and compostable packaging (standard 41.6.15) . It is important to specify what conditions are needed for composting as not all materials can be composted at home.

There is more information on this is in section 7.4

The following table shows the commonly used **materials identification system**. You should apply the symbol directly to the piece of packaging, and not on an attached label.

Material		Characteristics	Common uses	Abbrev (US)	Symbol & No.
Plastics	Polyethylene terephthalate	Rigid, transparent, glossy or translucent	Bottles, oven-ready meal trays, punnets, meat trays	PET (PETE)	1 PET
	High density polyethylene	Semi-rigid, translucent / waxy, weatherproof	Cosmetics bottles, milk bottles, food wrapping, washing up liquid bottles	HDPE	2 HDPE
	Polyvinyl chloride *	Can be clear or coloured, rigid or flexible	Squash and cordial bottles, toiletries containers	PVC (V)	3 PVC
	Low density polyethylene	Flexible, translucent, weatherproof, low water absorption	Carrier bags, flexible packaging	LDPE	4 LDPE
	Polypropylene	Semi-rigid, low gloss finish, translucent, tough	Margarine tubs, punnets, screw tops, microwaveable meal trays, yoghurt pots, flow wrap for bakery products	PP	5 PP
	Polystyrene	Hard, brittle, translucent and glossy or spongy, easily broken	Yoghurt pots, vending cups, foam meat or fish trays, hamburger boxes, 'insulating boxes'	PS	6 PS
	Other	All other resins and multi-materials	Melamine, 'biodegradable' plastics, such as PLA	–	7 OTHER
Metals	Steel	Magnetic	Food and drinks cans	FE	
	Aluminium	Not magnetic	Food and drinks cans, aerosols, cosmetics packaging	ALU	alu
* Not permitted under Soil Association organic standards (41.6.12)					

9.4 Other symbols

These are some of the symbols commonly used on packaging in the EU. It is important to note their exact meaning, when they may be used and which organisation, if any, regulates their use. To be able to use some of these symbols you must reach certain standards. This may require rigorous testing, external verification, and payment of a licence fee.

This is the symbol of a national recycling campaign to encourage consumers to recycle more, and more often, and to raise consumer awareness and interest in recycling. The campaign is backed up by a consumer website www.recyclenow.com. The symbols are used to identify recycling facilities and guide consumers to recycle the right materials in the right places. Copyright of the symbol is owned by WRAP.

www.recyclenowpartners.org.uk

This symbol reminds consumers to recycle glass jars and bottles, either at bottle banks or, where available, through kerbside collection schemes. It would be misleading to use this symbol to make a claim relating to the recycled content of glass.

The **Tidyman** logo is a reminder to 'dispose of this carefully and thoughtfully' and not to litter. It is mainly used on products intended for consumption 'on the go'. The logo was first used in the UK in the early 1970s as the branding for the Keep Britain Tidy campaign. EnCams holds the copyright for the Tidyman/Keep Britain Tidy symbol but the international Tidyman (left) can be used without restriction.

www.encams.org

FSC-GBR 087
FSC Trademark © 1996 Forest Stewardship Council A.C.

The Forest Stewardship Council (FSC) is an international network that promotes responsible management of the world's forests. It sets international standards for responsible forest management and it accredits independent third party organisations who can certify to FSC standards. The FSC trademark allows consumers to recognise products that support the growth of responsible forest management worldwide.

www.fsc.org

The **Green Dot** is a registered trademark that indicates the product manufacturer has paid a financial contribution to an authohrised packaging recovery scheme in some EU countries, for recycling the packaging. It is not used as a compliance mark in the UK directly, but does appear on products that are sold in many different European countries. The Green Dot does not imply that the packaging is made from recycled material or that it can be recycled. Anyone who produces packaging with a Green Dot, which is sold in the UK, must pay a licence fee. Manufacurers who wish to use the mark on their packaging if the product is sold in other countries can obtain copyright permisission. Valpak Ltd administers the Green Dot in the UK.

www.green-dot.org.uk

The **National Association of Paper Merchants** (NAPM) in the UK certifies papers and boards that comply with its definition of recycled paper. Paper or board must be made from a minimum of 75% waste paper and/or board fibre, which should not contain mill produced waste fibre.

www.napm.org.uk

The **EU Ecolabel** is currently only applied to non-food items and signals that the item meets rigorous environmental criteria, which cover the whole life cycle of the product from the extraction of raw material to use and end of lfe. The use of the label is governed by specific regualations.

http://ec.europa.eu/environment/ecolabel/index_en.htm

The German Institute of Quality Assurance and Labelling administers the **Blue Angel** scheme. Products with the label take into account all aspects of environmental protection, including the economical use of raw materials. Recycled paper qualifying for the mark must be made of 100% waste paper. Recycled cardboard products must contain at least 65% low or medium grade waste paper. The use of optical whiteners is prohibited and various chemicals used for waste paper processing and in the production of recycled paper, recycling cardboard and printing may no longer be used. When awarded, the logo may be used, directly on a product, or on promotional materials by service companies.

www.blauer-engel.de

The **Nordic White Swan** label was introduced in 1989 to encourage production methods that create the minimum environmental impact. The scheme takes into consideration the product's impact on the environment from the raw material to waste and sets criteria for quality and performance. Criteria are revised frequently to ensure products are always at the cutting edge from an environmental perspective.

www.svanen.nu

The **RESY** system is a German based system guarenteeing the recycling of corrugated board products and corrugated board shipping containers.

www.resy.de

10 Glossary

Biodegradable	any material that will decompose back to its basic elements through the action of micro-organisms
Closed-loop	a type of recycling in which products, at the end of their useful life, are used as a resource to remanufacture the same product
Coating	a layer of film spread over the surface of a material, usually for visual or protective effect
Co-extruded	a material consisting of several layers, formed together during the manufacturing process
Compostable	a characteristic of a product or material that allows it to biodegrade, generating a relatively homogeneous and stable humus-like substance
Composite packaging	packaging made from more than one material where the layers cannot be separated easily, such as the cartons commonly used for milk. Distinct from multi-material packaging which is made from assembled components of different materials which can be easily taken apart
Cullet	pieces of glass intended for recycling
Degradable	a material that, under specific environmental conditions, breaks down to a specific extent within a given time
Direct sale	the sale of goods to the ultimate consumer by the producer
Essential Requirements	legal requirements introduced in 1998 that set out the requirements that packaging must meet before being placed on the UK market. Has its origin in the EC Packaging and Packaging Waste Directive 94/62/EC. The DTI has lead responsibility for the regulations
Flexographic (flexo)	a method of printing commonly used for packaging. It uses rollers with a flexible rubber-like surface coated with quick-drying ink. The roller prints with a raised print pattern which rolls over the packaging material. A wide range of inks can be used and the process is suitable for a variety of different materials. The ink dries quickly and allows the machine to run at high speed
Genetic modification	modifications to DNA which cause it to be changed in a way that is impossible through conventional techniques. The use of genetically modified substances is not permitted by Soil Association standards
Green Claim	information appearing on a product, its packaging, or in related literature or advertising material, which can be taken as saying something about its environmental aspect
Greenhouse gas	a gas, such as carbon dioxide (CO2), methane (CH4), chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), that absorbs and re-emits infrared radiation, warming the earth's surface and contributing to climate change
Heavy metals	a group of elements between copper and lead on the periodic table of the elements. Living organisms require trace amounts of some heavy metals, others such as mercury, lead and cadmium have no known vital or beneficial effect on organisms, and their accumulation over time in the bodies of mammals can cause serious illness

Hot filling	a packaging technique in which bottling is carried out while the product is hot, to extend shelf life or reduce preservative use
Hot-melt adhesive	polymer adhesive, solid at room temperature, which is liquefied by heat, applied molten and forms a bond by cooling and solidifying
Lacquer	a thin, natural or synthetic resinous coating
Laminate	to cover or overlay with a thin sheet of material
Life cycle	consecutive and inter-linked stages of a product system, from raw material acquisition or generation of natural resources to final disposal
Lithographic	a process for printing on smooth surfaces. Lithography works because of the repulsion of oil and water. The flexible aluminium or plastic printing plates are not raised but the printing part of the surface is treated to receive and transmit ink, the non-printing surface is treated to attract water and repel ink
Material Identification Code	a numbering system for identifying the composition of materials. The symbols used in the code consist of arrows that cycle clockwise to form a rounded triangle, usually with a material number and letter abbreviation. Also known as a resin identification code or polymer identification code
Mechanical fastening	a method of closing packaging without the need to use glue or staples, for example by using interlocking tabs
Möbius loop	the three chasing arrows symbol, used on goods that are 'recyclable' or that include 'recycled content'
Packaging	products manufactured for the containment, protection, handling, delivery or presentation of goods, which may range from raw materials to finished products
Packaging Compliance Scheme	a scheme which takes on a company's responsibility to meet the targets for the recovery and recycling of packaging waste, as set by the Producer Responsibility Obligations (Packaging Waste) Regulations
Phthalates	a group of chemical compounds that are mainly used as substances added to plastics to increase their flexibility
Post-consumer	a finished material that would normally be discarded as a solid waste after having completed its life cycle as a consumer item
Primary packaging	packaging that contains the finished product, sometimes called retail packaging
Process Chlorine Free (PCF)	used to describe paper and board made from recycled fibres that have not been re-bleached with any chlorine or chlorine-derived bleach. PCF (as with TCF) paper has not been bleached during its production with chlorine gas, chlorine dioxide or any other bleaching agent that contains a chlorine compound. Oxygen, ozone and hydrogen peroxide are some of the alternatives used. Sometimes also referred to as Secondarily Chlorine Free (SCF)

Producer Obligations	full title is the Producer Responsibility Obligations (Packaging Waste) Regulations 2005. These regulations provide the statutory framework by which the UK must meet the minimum recovery and recycling targets set by the EU. The regulations place obligations on UK companies over a certain size. Defra has overall responsibility while the regulations are administered and enforced by the Environment Agency in England and Wales, the Scottish Environmental Protection Agency, and the Environment & Heritage Service in Northern Ireland
Recycling	process in which solid waste is collected, separated and processed and returned to use in the form of a raw material or product
Renewable	a naturally occurring raw material or form of energy that has the capacity to replenish itself through ecological cycles and sound management practices
Reusable	an item which can be used again for the same or different purpose in its original form, without processing except for specific requirements such as cleaning and washing
Rotogravure	a machine printing process by which ink is transferred to paper as it passes between an engraved printing cylinder rotating against an opposing impression cylinder
Secondary packaging	packaging that is additional to the primary packaging and is used for display purposes or for grouping a set of single units into a sales group or multi-pack, sometimes called grouping or display packaging
Shelf-ready	secondary packaging that is purposely made to display many single units of product together for sale, in order to speed restocking from storeroom to shelf
Sustainable	capable of being continued with minimal long-term effect on the environment, meeting present needs without compromising those of future generations. Sustainable sourcing of renewable materials allows for the resource to regenerate before being used again
Tertiary packaging	outer packaging used for the shipment and distribution of goods. Sometimes called transport packaging
Totally Chlorine Free (TCF)	a bleaching process which does not use any form of chlorine or chlorine compounds. Alternative bleaching agents are used, such as oxygen, hydrogen peroxide, or ozone. TCF should not be confused with the similarly named Elemental Chlorine Free (ECF). ECF paper is bleached with chlorine compounds (chlorine dioxide) but it does not use chlorine in its elemental form (chlorine gas).
Volatile Organic Compound (VOC)	any compound containing carbon and hydrogen or containing carbon and hydrogen in combination with other elements, which evaporates readily into the atmosphere
Waste hierarchy	a sequential listing of waste management options based on their relative environmental benefits, and order of sustainability. Originally developed in Europe during the 1970s

11 Sources of further information

These are some suggested organisations that may be able to offer you further guidance on packaging and waste issues.

General waste and resource efficiency information

Envirowise Tel 0800 585794 helpline@envirowise.gov.uk www.envirowise.gov.uk	Free advice to businesses and support on practical ways to minimise waste, reduce environmental impact, and increase profitability. Provide good-practice case studies, site visits and expert advisors, and organise workshops and exhibitions around the UK.
RECOUP Tel 01733 390021 enquiry@recoup.org www.recoup.org	Information on plastics waste management, expertise and guidance to people across the plastics supply, use and disposal chain.
Waste and Resources Action Programme (WRAP) Tel 0808 100 20 40 helpline@wrap.org.uk www.wrap.org.uk	A non-profit company working to create stable and efficient markets for recycled materials and products, and engage the public by raising awareness of the need to reduce waste and recycle more. It operates a number of materials programmes; maintains a recycled product guide (www.recycledproducts.org.uk); and operates the Recycle Now campaign (www.recyclenow.com).
Waste Watch and Waste Online Tel 020 7549 0300 info@wastewatch.org.uk www.wastewatch.org.uk www.wasteonline.org.uk	A charity dedicated to the reduction, reuse and recycling of household waste. Provides educational projects, information, consultancy, publications and training events, and advocacy. Online source of information on sustainability, resource use and waste issues.

Regulatory information

Defra Tel 8459 335577 helpline@defra.gsi.gov.uk www.defra.gov.uk/environment/waste	General information on recycling and waste and information on packaging regulations.
DTI Tel 020 7215 5000 dti.enquiries@dti.gsi.gov.uk www.dti.gov.uk/innovation/sustainability	Packaging and packaging waste information, including information on the Essential Requirements Regulations and the Producer Responsibility Obligations.

Environment Agency (England and Wales) Tel 08708 506506 enquiries@environment-agency.gov.uk www.environment-agency.gov.uk www.netregs.gov.uk	Advice on applications for permits and guidance on regulatory compliance and good practice. Amongst other waste related responsibilities, the Agency administers and enforces the Producer Responsibility Obligations (Packaging Waste) Regulations in England and Wales. The NetRegs website provides plain language guidance for businesses on environmental legislation, and how to comply with it, as well as advice on good environmental practice. Free to use.
Food and Drink Federation Tel 020 7836 2460 generalenquiries@fdf.org.uk www.fdf.org.uk	Represents the UK food and drink manufacturing industry, promotes the industry's views and works to build consumer confidence in the food chain.
Food Standards Agency (FSA) Tel 020 7276 8000 www.food.gov.uk helpline@foodstandards.gsi.gov.uk	Independent Government department set up to protect the public's health and consumer interests in relation to food. Provides food law support for small businesses.
Northern Ireland Environment and Heritage Service (NIEHS) Waste Management and Contaminated Land Unit Tel 028 9054 6481 www.ehsni.gov.uk	Responsible for the implementation of waste management policy and the promotion of a more sustainable approach to dealing with waste in Northern Ireland. Amongst other waste related responsibilities, the NIEHS administers and enforces the Producer Responsibility Obligations (Packaging Waste) Regulations in Northern Ireland.
Scottish Environmental Protection Agency (SEPA) Tel 01786 457700 producer.responsibility@sepa.org.uk www.sepa.org.uk	Responsible for the protection of the environment in Scotland. Includes responsibility for waste management including the Producer Responsibility Obligations Regulations (Packaging Waste) in Scotland.
Trading Standards www.tradingstandards.gov.uk	Consumer protection information and advice and guidance for business. Responsible for enforcing the Packaging Essential Requirements Regulations.

General packaging information

British Retail Consortium (BRC) Tel 020 7854 8900 www.brc.org.uk	Campaigns to promote and protect UK retailers' interests and offers a range of services to its members. With the Institute of Packaging they have developed a global standard to assist retailers and food manufacturers in the fulfilment of their legal obligations. The standard is most applicable to manufacturers of food contact packaging for retailers' labelled products and branded goods.
Demi info@demi.org.uk www.demi.org.uk	Information web site on design for sustainability.
European Organization for Packaging and the Environment (EUROPEN) Tel 0032 2 736 3600 packaging@europen.be www.europen.be	Industry trade organisation. Presents the opinions of its members on issues related to packaging and the environment. Advises on the use, role, benefits and functions of packaging in society, such as protection of products and the environment.
Industry Council for Packaging and the Environment (INCPEN) Tel 0118 925 5991 info@incpen.org www.incpen.org	A non-profit organisation that represents a group of companies with common interests in packaging and sustainable development. Works to analyse the environmental and social effects of packaging; create a better understanding of the role of packaging; and educate on minimising the environmental impact of packaging.
Packaging Federation Tel 020 7808 7217 enquiries@packagingfedn.co.uk www.packagingfedn.co.uk	Representative body of the UK packaging manufacturing industry. Actively promotes the industry and the products it produces. It also co-operates with trade associations and other organisations, to ensure that the packaging industry is represented on pan-industry issues.
The Institute of Packaging: The Packaging Society Tel 01476 514590 iop@iom3.org www.iop.co.uk	Source of information on all packaging related matters. Maintains a directory of materials consultants and expert witnesses

Materials

Biodegradable	
Composting Association Tel 0870 160 3270 membership@compost.org.uk www.compost.org.uk	Information on composting and certification. Operates solely for its members.
European Bioplastics Tel 0049 30 28 482 350 Info@european-bioplastics.org www.european-bioplastic.org	A coalition of stakeholders who promote biodegradable materials.
Paper and board	
The European Association of Carton Manufacturers and Cartonboard Mills (Procarton) Tel 020 7915 8390 uk@procarton.com www.procartonuk.com	Promotes the use of cartons, providing facts and information.
The Alliance for Beverage Cartons and the Environment (ACE/LFCMA) Tel 0870 442 6019 samantha.edgar@tetrapak.com www.drinkscartons.com	An international coalition of manufacturers who provide information on the consumer and environmental benefits of composite packaging.
Soil Association Woodmark Tel 0117 914 2435 wm@soilassociation.org www.soilassociation.org/forestry	The Soil Association's international forestry and chain of custody certification scheme.

Programme for the Endorsement of Forest Certification schemes (PEFC) PEFC Council ASBL Tel 00 352 26 25 90 59 pefc@pt.lu www.pefc.org	NGO that promotes sustainably managed forests through independent third party certification. The PEFC provides an assurance mechanism to purchasers of wood and paper products that they are promoting the sustainable management of forests. Currently, PEFC permit the use of GM trees – material from which is not permitted under Soil Association organic standards.
Forest Stewardship Council (FSC) Tel 00 49 228 36 76 60 fsc@fsc.org www.fsc.org	An international, NGO network dedicated to promoting responsible management of the world's forests. Operates a system of forest certification and product labelling that allows consumers to identify wood and wood-based products from well-managed forests. The most widely supported scheme of its kind. Searchable certification database.
Forest Stewardship Council (FSC) UK Working Group Tel 01686 413916 info@fsc-uk.org www.fsc-uk.org	The FSC UK Working Group is the first point of contact in the UK for queries related to the FSC system. They offer a range of services ranging from a free advisory service to full training and consultancy in responsible forest management.
Confederation of paper industries Tel 01793 889600 cpi@paper.org.uk www.paper.org.uk	Trade association for all sectors of the paper industry to unite, discuss, and resolve issues of common interest and to promote a positive image for paper in its many applications. Information on the paper industry.
Plastics	
The Flexible Packaging Association (FPA) Tel 01666 880406	Represents converters of flexible packaging in the UK, and their suppliers.
British Plastics Federation (BPF) bpf@bpf.co.uk Tel 020 7457 5000 www.bpf.co.uk	Trade body representing the UK plastics industry.
Plastics & Industrial Films Association (PIFA) Tel 0115 942 2445 pifa@pifa.co.uk www.pifa.co.uk	Represents the plastic film, sheet and converted plastic materials industry.

Coatings, printing and inks	
British Coatings Federation (BCF) Tel 01372 360660 enquiry@bcf.co.uk www.coatings.org.uk	UK trade association for the decorative, industrial and powder coatings, and printing inks industry.
British Printing Industries Federation (BPIF) Tel 0870 240 4085 kyle.jardine@bpif.org.uk www.britishprint.com	Support organisation for the UK print, printed packaging and graphic communication industry.
Glass	
British Glass Tel 0900 801 3322 www.britglass.co.uk info@britglass.co.uk	Represents all sectors of the UK glass industry, promoting the use, reuse and recycling of glass. Offers guidance on environmental, technological and legal issues.
Cotton	
Towards a Moral Fibre Programme **Pesticide Action Network (PAN) UK** Tel 020 7065 0905 admin@pan-uk.org www.pan-uk.org	Supports the growth of organic cotton production systems that respect the environment and the producers who work in the system and increase organic and ethical production and consumption in textiles.
Sustainable Cotton Initiative at World Wide Fund for Nature (WWF) UK Tel 01483 426444 info@wwf.org.uk www.panda.org	Aims to reduce the amount of water and chemicals used to grow cotton so that ecosystem health is sustained by adequate flows – an important step towards making cotton production more sustainable.

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