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Packaging for people, planet and profit - a sustainability checklist



Design & innovation



Food production



Food manufacturing



Transport & distribution



Retail stacking & display



Customer useability

Foreword

By Environment Minister **Thérèse Coffey**



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Our packaging industry plays a critical role in protecting and preserving the goods the UK produces. But in the food sector, the industry also has an essential role in preventing waste.

So it's crucial we continue to explore opportunities to ensure packaging is not only effective, but is also sustainable and recyclable where possible. I hope the Checklist will help to drive future innovation.

We have made great progress in boosting recycling rates and making more packaging recyclable, and we continue to see exciting innovation in this area. But there is still much more to be done to increase sustainability across the supply chain – from producers and into the home.

That's why it is so encouraging to see food and drink manufacturers, packaging companies and retailers working together on the Wrap Framework for Greater Consistency in

Household Recycling, sharing a vision to make recycling at home significantly easier for the wider public.

This framework is a strong development towards a more sustainable future, helping to increase resource efficiency and waste prevention, while contributing to an overall reduction in carbon use.

A whole chain effort is needed to truly succeed, and we must all make the best use of our resources – that is why I welcome these initiatives and the work of the Food and Drink Federation and INCPEN to help us make supply chains more resource-efficient and better protect our environment.

Introduction - 1

This Checklist has been prepared jointly by the Food and Drink Federation (FDF) and INCPEN – the Industry Council for research on Packaging & the Environment. Jointly these organisations are estimated to cover a significant proportion of businesses involved in the supply system for packaged goods, accounting for 46% of UK manufacturing employment with a turnover of around £280 billion.

We encourage our members and others to use it and commend it to their suppliers, customers and other companies. We will track the reach of the checklist through the number of organisations that download it and will monitor its use through member feedback.

fdf

FDF – the Food & Drink Federation is the voice of the UK food and drink industry, the largest manufacturing sector in the country. We communicate our industry's values and concerns to Government, regulators, consumers and the media. We also work in partnership with key players in the food chain to ensure our food is safe and that consumers can have trust in it.

Disclaimer of liability

Every effort has been made to provide accurate and complete information. However, FDF and INCPEN expressly disclaim liability for errors and omissions in the content.
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INCPEN

INCPEN – the Industry Council for research on Packaging and the Environment is a group of manufacturers and retailers from across the supply chain who carry out research to understand the environmental and social effects of packaging and work together to promote resource efficient packaging for sustainable supply chains.



Introduction - 2

Packaging is part of the system for delivering products from point of production to point of consumption.

Its main purpose is to protect the product and ensure it is delivered safely and in perfect condition to the end user.

Its role in a circular economy is to maintain the value in a product for as long as necessary and to help eliminate product waste.

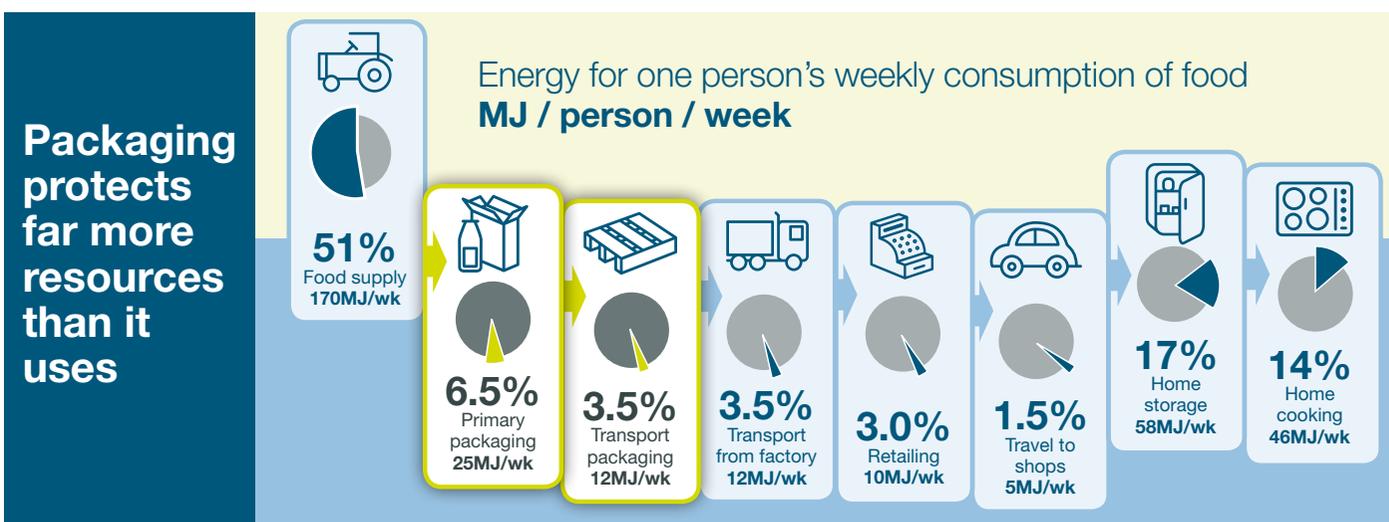
On average ten times more resources – materials, energy and water – are invested in products compared with the resources used to produce their packaging.

Therefore the direct costs associated with using packaging are relatively small compared to the value it adds to the supply chain in ensuring that these embedded resources do not go to waste.



Frozen peas journey

My journey → to the supermarket has involved ❄ temperatures from -15°C up to 26°C, ⇄ 12 conveyor belts, 🚧 300 potholes, 🛣 46 dodgy country roads, 🏔 256 speedbumps, 🔄 75 roundabouts and one very swift ! handbrake turn to avoid 🐻 a kamikazee badger. But I'm still in one piece. 📦 Packaging: It's come a long way.



Source: 'Table for One: the energy cost to feed one person' by Dr Jan Kooijman

Introduction - 3

To achieve overall resource-efficiency across the value chain, the functional aspects of packaging have to be the top priority. In addition, responsible companies want to make products easy and efficient to use and want to reduce the environmental impact of packaging. They also want to encourage people to recycle more packaging once it has done its job and for them to be able to do this more consistently wherever they live.

This Checklist will help companies to choose and optimise their packaging so that it contributes to a net improvement in the use of resources, makes supply chains more resource-efficient, achieves a high level of safety and hygiene, meets consumers' needs and preferences and addresses environmental issues.

Addressing these issues holistically rather than individually can be expected to deliver important business benefits not only in terms of operational savings but also due to less wastage arising in the supply chain and in the home. It has been written primarily for users of packaging placing products on to the UK market but some questions may need to be shared with other partners in the supply chain.

It also aims to stimulate innovation in the design of packaged product systems and encourage continuous improvement to help companies become more responsive to the demands of rapidly changing lifestyles and demographics.

Each stage in the system places different demands on packaging. Each operator – packaging manufacturer/converter, packer/filler, distributor, retailer and consumer - has different expectations and demands, all of which influence packaging design. Design also has to take into account how the packaging will be treated after use in order to maximise recovery of resources.

Different options to reduce environmental impact in a circular economy

MIXED MATERIALS



TOP OF THE SUPPLY CHAIN
Prevention of waste at source

Use fewer materials

SINGLE MATERIAL



BOTTOM OF THE SUPPLY CHAIN
Recovery of waste at end-of-life

Recover materials

Low input of materials	✓	✗	More material
More transport packaging	✗	✓	Less transport packaging
Slower filling speeds	✗	✓	Faster filling speeds
Fewer delivery lorries	✓	✗	More delivery lorries
Stimulates innovation – new materials	✓	✗	Can stifle innovation – restricted material choice
Likely insufficient 'clean' material to justify collecting, sorting, cleaning for recycling	✗	✓	Often sufficient 'clean' material to justify collecting, sorting, cleaning for recycling
	3	3	

Introduction - 4

Packaged products system

Products are typically protected by the combined properties of the sales (primary), grouping (secondary) and transport (pallets, crates, containers) packaging and together they deliver products from farm or factory to the end user.

This checklist applies both to packaging intended for consumer goods as well as business-to-business.



Introduction - 5

Checklist for business

Ideally packaging design should be considered at the same time as a product is designed or formulated as there may be opportunities to adapt the product in order to make the whole system more resource-efficient.

The checklist covers choice and design of packaging for:

- Functionality

- Re-use, recovery and recycling of materials

- Transport

It is a good idea to keep a record of assessments to be able to demonstrate improvements over time.

The Checklist therefore:

- 
- > challenges the design of existing packaging;
 - > ensures that packaging continues to meet all necessary regulatory, safety and hygiene criteria and is acceptable to the consumer;
 - > requires packaging to be designed to protect and deliver goods efficiently so that products are properly protected and product waste is kept to a minimum;
 - > provides guidance on overall resource efficiency throughout the supply chain (including during transport, storage, retailing and use) and on recovery, recycling and disposal of used packaging.

Functionality of packaging - 1

In general terms, eco-design means using sufficient materials to provide optimal protection for each product and to deliver all the other functions expected of it. This includes enabling the product to survive distribution, handling, merchandising, carry information, be marketed, easy to use and to be capable of being recovered after use. It also means using materials from sustainable sources.

Design-for-recycling is one consideration but design-for-maximum lorry loads, design-for-efficient stacking in depots, design-for-fast filling speeds, design-for-efficient use and many other practical, functional requirements are equally, if not more, important.

All of these considerations have environmental implications: fewer lorries on the road means less congestion, fewer particulates, and better health; smaller or fewer depots use less land; faster filling speeds require less energy.

At each stage of the design process, it is a good idea to check the effect that any change may have on other parts of the supply system and the ability of packaging to perform all required functions. This is often referred to as 'lifecycle thinking'.

It needs to be appreciated that there is seldom an obvious 'right' answer but decisions should be fully informed and evidence based. Final design is usually a compromise between sometimes-conflicting demands.

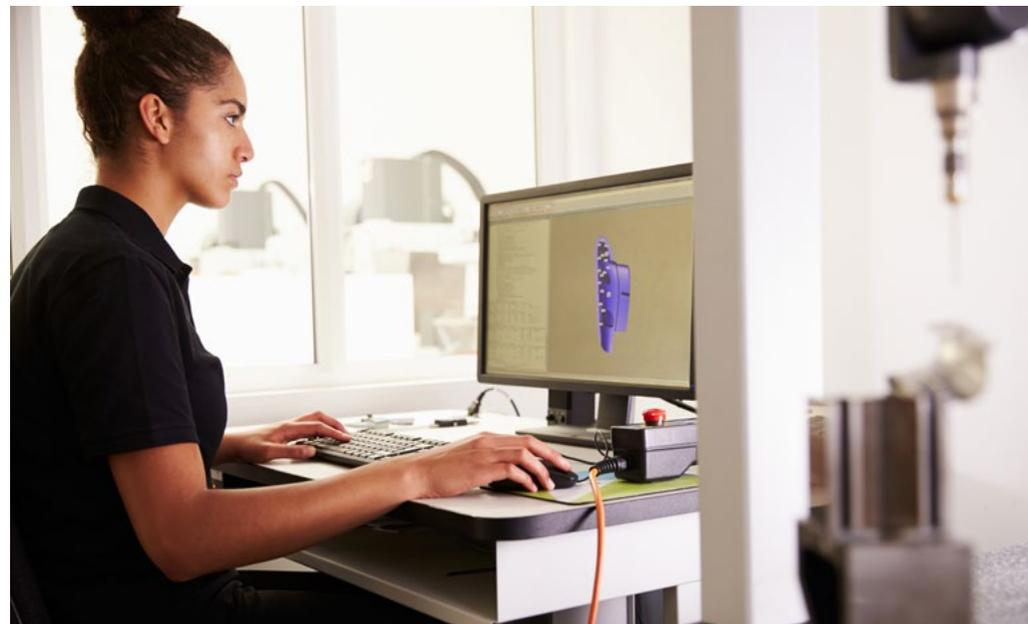
The final packaging design is usually a compromise between sometimes conflicting demands.



Functionality of packaging - 2

In this section:

1. What kind of packaging is needed?
2. Does the packaging (all levels together) use the minimum amount of material to maintain the necessary level of protection, safety and hygiene for the product?
3. Is it possible to omit or reduce components? What factor or factors limit further reduction in material use?
4. Are specifications and information available for the materials making up the packaging?
5. Is the packaging produced in-house?
6. Can losses during the filling or packing process be reduced?
7. If the packaging is returnable, can it be made collapsible or reduced in some other way during the return journey?



1. What kind of packaging is needed?

- Sales or primary packaging?
- Grouping or secondary packaging?
- Transport or tertiary packaging?

It is important to consider all three levels of packaging together so that a reduction in one component is not cancelled out by an increase in another.

Functionality of packaging - 3

2. Does the packaging (all levels together) use the minimum amount of material to maintain the necessary level of protection, safety and hygiene for the product?



Physical strength: Packaging must have sufficient physical strength to protect, contain and secure the product.

It should provide adequate stacking strength, cushion the product against reasonable and predictable shocks and provide resistance to puncturing, scratching and abrasion.

Lifting or carrying devices must be adequate.



Barrier properties: Packaging needs to provide a defined level of barrier between the contents and the external environment both to contain and protect the product and also to protect the environment from some products. At a basic level the product must not leak.

At a more complex level the packaging may need to provide a barrier to oxygen or light.

In some situations packaging may need to serve as a barrier against possible migration of chemicals from other constituent parts of the packaging.

It must preserve the product for a defined period of time when stored in anticipated conditions of temperature, humidity and light.

It should also prevent unacceptable levels of product loss through absorption or transmission.



Contamination: Packaging materials must be hygienic and not taint or impart odour to the product.

When in use and when recovered or disposed of, packaging materials must not contaminate the product or the environment.



Closure and re-closure: The closure must be convenient and easy to use and operate properly for at least the number of times necessary.

If the opening and, where required, closing method is not obvious, clear instructions must be provided.

Functionality of packaging - 4

Q2 contd...



Communication: Packaging has to be capable of carrying relevant information to help inform handling, choice and use of the product, including the information required by law.

Consideration should be given to providing guidance by including messages or symbols or other meaningful information on how to use the packaging in the best way, how to sort it for recycling and how to dispose of it in the most environmentally responsible way.



Product life: Packaging must be designed to carry out its functions for the required life span of the product and must not be corroded or otherwise degraded by the product or the atmosphere.



Tamper-resistance: if the product could endanger the health of consumers (eg strong cleaners) or be contaminated, consider tamper-evident features.



Appeal to children: The packaging for medicines and some non-food products which can be potentially hazardous to children should not resemble products that children are familiar with.



Child resistant packaging: Child resistant packaging should be considered for products where accidental consumption could present a hazard and balanced with consideration to people with reduced ability to open it.



Honest presentation: Sales packaging for consumer goods must not give a false impression of the nature, quantity or quality of the product.



Removing product from the packaging: Some product may get left inside packaging. This is known as Unintentional Product Residue. It can occur because the product is trapped in the packaging or if the product becomes unusable before the consumer has a reasonable chance to use it.

Residues are an environmental and financial cost and a potential reputational risk for manufacturers. See INCPEN's The Bit at the Bottom guidance on how to avoid it¹.

¹ <http://www.incpen.org/resource/data/incpen1/docs/UPR.pdf>

Functionality of packaging - 5

3. Is it possible to omit or reduce components?

What factor or factors limit further reduction in material use?

- › Has the optimum relationship between sales, grouping and transport packaging been achieved?
- › Is the relationship between the volume of the contents and volume of the packaging optimal?
- › Can a change in design allow a reduction in the size or shape of the packaging while maintaining its capacity?
- › Can less material be used by modifying the volume sold eg more sales units per box, larger portions, bulk or loose? (Check against the requirements of Directives and laws that restrict the quantities and capacities permitted for certain pre-packaged goods – such as Council Directive 87/356/EEC relating to the ranges of nominal quantities and nominal capacities permitted for certain pre-packaged products¹).
- › Can less material be used by changing the physical nature of the product (eg use of concentrates) or by using an alternative material?
- › Are pallets being used to their maximum potential eg are the dimensions of the sales and grouping packaging compatible with the pallet dimensions?
- › Is the use of additional resources such as intermediate layers, shrink wrap, adhesives, tapes entirely necessary? Could such items hinder the ability to recycle the pack after use?
- › Can the distribution system be modified in a way that could reduce the amount of energy, packaging or cost? For example, some materials can provide sufficient protection to allow a food to be distributed at ambient temperature as opposed to chilled.

4. Are specifications and information available for the materials making up the packaging?

Specifications for all packaging need to meet the Packaging (Essential Requirements) Regulations². Packaging intended to come into contact with food and drink also needs to comply with EU food contact legislation which will limit the choice.

LEGISLATION



- › Are the specifications optimum eg can some components be strengthened or weakened to reduce overall use of material?
- › Has the use of recycled materials been considered? Be aware though that the inclusion of recycled content may

¹ <http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:31987L0356>

² https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/460891/BIS-15-460-packaging-essential-requirements-regulations-gov-guidance-notes.pdf

Functionality of packaging - 6

Q4 contd...

produce unfavourable trade-offs such as greater greenhouse gas emissions or require significantly more material to maintain the same functionality. For food contact packaging it is also important to ensure the use of recycled content meets the requirements of EU food contact legislation.

- › Are there any hazardous substances in the packaging material or are the contents classed as hazardous? Either will mean the packaging will need special consideration at the waste treatment and management stage.

5. Is the packaging produced in-house?

• If not:

- › Is there a procedure to specify the packaging material requirements jointly with the supplier?
- › Is there a method of checking if materials have been damaged or lost between supplier and customer?

• If so:

- › Have steps been taken to reduce packaging production waste to a minimum?
- › Can the environmental efficiency of the production process be improved?

6. Can losses during the filling or packing process be reduced?

- › Has material or packaging loss been discussed with the machinery or packaging suppliers?
- › Have there been tests to identify an optimum balance between filling rates, loss of product and loss of packaging?
- › Is the packaging always filled to the design fill point, taking into account the nature of the product, any headspace requirements and any relevant legislation such as the packaged goods, weights and measures regulations?

7. If the packaging is returnable, can it be made collapsible or reduced in some other way during the return journey?

Re-use, recovery & recycling

1. If part or all of the packaging is intended to be re-used, is it physically capable and strong enough to be re-used and is there a system in place for its re-use?

- > When empty, can the sales packaging be re-used at home if the product is made available in a less robust, refill pack? For example, can a tin be refilled with biscuits from a roll wrap, or a jar refilled with spices from a carton or bag?
- > Is the packaging designed so it can be adapted or re-used for another purpose? For example, can an Easter Egg carton be turned into a board game, coffee jars be used to store flour, sugar or rice, or jars be used as flower vases?
- > Is a system in place so the packaging can be reconditioned and used for the same or another purpose?
- > Is the final user made aware of the re-use opportunities?



2. After use, is the packaging capable of being recycled or otherwise recovered either as a material, through composting or energy recovery?

- > Has the packaging been designed such that once it has completed its job recovery of the used packaging can be maximised including through use of materials that are readily recyclable and which will not cause recycling issues? NB whether the material is suitable for recycling or another form of recovery will come down to a trade off between all the considerations that go into the choice and design of packaging for any given product.
- > Has the packaging been designed to help its sortability at end of life – including choice of material colour, use of readable inks and ability to separate into constituent materials (and taking account of the trade-off with keeping all parts together so, if it becomes litter, it is only one piece)?
- > Where appropriate has the use of material identification symbols, messages or other forms of information been considered to help consumers to segregate more easily for recycling?
- > If the packaging is designed to be composted, what steps have been taken, including through on-pack communication, to ensure that it does not enter the recycling collection stream?
- > Has the use of information and/or logos to encourage responsible disposal and discourage littering been considered?



Transport

- › Is the packaging and packaged product delivered by the most optimal route in terms of reducing vehicle miles and minimising other environmental impacts?
- › Is there an opportunity to improve the maximum vehicle loading?
- › Has the opportunity to share loads with other suppliers/customers been considered?

See the FDF Checklist for Greener Food Transport³ for more best practice tips.



FDF's 10-Point Checklist for Greener Food Transport

- Maximising vehicle loading
- High ratio of trailers to tractors
- Compliance with the latest EU emissions standard
- Use of vehicle telematics
- Collaboration to reduce empty running
- Increase usage of rail and/or ship
- Supporting innovation and promoting best practice
- Driver training
- Vehicle maintenance including refrigerated transport
- Use of alternative fuels

³ https://www.fdf.org.uk/transport_efficiency.aspx

Further information - 1

Regulations and standards

EU Packaging and Packaging Waste Directive (94/62/EC)

Information on the Directive and the relevant EU amending instruments can be found here:

<http://ec.europa.eu/environment/waste/packaging/>

The Directive is implemented in the UK through the Producer Responsibility Obligations (Packaging Waste) Regulations 2007 (as amended) <http://www.legislation.gov.uk/ukksi/2007/871/note/made>.

The environmental regulators in the four UK countries are responsible for enforcing the Producer Responsibility Regulations. They can be contacted as follows:

Environment Agency (England):
packaging@environment-agency.gov.uk

Natural Resources Wales:
packaging@naturalresourceswales.gov.uk

Northern Ireland Environment Agency:
packaging@doeni.gov.uk

Scottish Environment Protection Agency:
producer.responsibility@sepa.org.uk

The Packaging (Essential Requirements) Regulations 2015 (SI 2015/1640)

These Regulations, which implement the single market and design and manufacturing aspects of the Packaging and Packaging Waste Directive (PPWD) into UK law, address the essential functionality of packaging by specifying that this must be achieved using the minimum packaging necessary. The Regulations and associated government guidance notes are available from Gov.uk:

<https://www.gov.uk/government/publications/packaging-essential-requirements-regulations-guidance-notes>

The body responsible for enforcement of the Essential Requirements Regulations is local authority trading standards departments except in Northern Ireland where it is the Department of Enterprise, Trade and Investment (Email: tss@detini.gov.uk). Details of your local Trading Standards can be found by entering your postcode at: <https://www.gov.uk/find-local-trading-standards-office>

CEN packaging standards

The key CEN standards supporting the essential requirements provisions in the EU Packaging and Packaging Waste Directive are as follows:

BS EN 13427:2004

Packaging. Requirements for the use of European Standards in the field of packaging and packaging waste

BS EN 13428:2004

Packaging. Requirements specific to manufacturing and composition. Prevention by source reduction

BS EN 13429:2004

Packaging. Reuse

BS EN 13429:2004

Packaging. Reuse

BS EN 13430:2004

Packaging. Requirements for packaging recoverable by material recycling

BS EN 13431:2004

Packaging. Requirements for packaging recoverable in the form of energy recovery, including specification of minimum inferior calorific value

BS EN 13431:2004

Packaging. Requirements for packaging recoverable in the form of energy recovery, including specification of minimum inferior calorific value

BS EN 13432:2000

Packaging. Requirements for packaging recoverable through composting and biodegradation. Test scheme and evaluation criteria for the final acceptance of packaging

Further information - 2

Available from British Standards Institution: <http://shop.bsigroup.com/en/Browse-by-Sector/Manufacturing/Packaging/Packaging/>

EU Food Contact Legislation

EC guidance on EU legislation covering general principles of safety and inertness for all food contact materials along with details of material specific measures can be found here: http://ec.europa.eu/food/safety/chemical_safety/food_contact_materials/legislation/index_en.htm

Guidance produced by the Food Standards Agency can be found here: <http://www.food.gov.uk/business-industry/guidancenotes/contaminants-fcm-guidance>

Food information to consumers

Defra and FSA guidance on how to comply with the European Food Information to Consumers Regulation No 1169/2011 and which is enforced in the UK through the Food Information Regulations 2014 (SI No. 1855) can be found here:

<https://www.gov.uk/guidance/food-labelling-giving-food-information-to-consumers>

Guidance

Defra Green Claims Guidance

Defra's guidance to promote the use of clear, accurate and relevant environmental claims in marketing and advertising can be found here: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69301/pb13453-green-claims-guidance.pdf

Packaging design guidance

IGD guidance on designing for waste prevention and resource minimisation: <http://www.igd.com/Research/Supply-chain/Supply-Chain-Waste-Prevention-Guide-2013---from-factory-in-gate-to-till/Five-to-Drive-to-Prevent-Waste/Five-to-Drive-to-Prevent-Waste-Design/>

INCPEN guidance on Packaging for e-commerce [Packaging & the Internet](#)

INCPEN guidance on Designing packaging for complete removal of the product [The Bit at the Bottom](#)

Recoup's design guidance 'Recyclability by Design' provides guidance and advice to brand owners, packaging technologists and packaging developers to help them consider the recyclability of plastic packaging during the design stage. <http://www.recoup.org/p/130/recyclability-by-design>

WRAP Guidance on Plastic Packaging - Design for Recyclability- covering:

- plastic pots, tubs and trays and non-drinks bottles

-PET bottles

-HDPE milk bottles

<http://www.wrap.org.uk/df>

Recycling guidelines

WRAP's recycling guidelines, whilst primarily focused on what can and cannot be collected for recycling from householders, could in turn help to inform brands, manufacturers and retailers on the design of packaging together with the development of communication messages for consumers.

<http://www.wrap.org.uk/content/recycling-guidelines>



Foreword

Introduction

Packaging checklist for food & drink business

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Further
information

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