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Material change for
a better environment

Packaging Innovations and Evolution
in the Food & Drinks sector

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Product & Packaging Design

Packaging Innovations (EasyFairs)

NEC, 28 February 2013

Courtauld Commitment Phase 2 (2009-2012)

- A voluntary agreement aimed at improving resource efficiency and reducing the carbon and wider environmental impact of the grocery retail sector
- WRAP is responsible for the agreement and works in partnership with retailers, brand owners and suppliers who support delivery of the targets
- Supports the aim of the UK Climate Change Act 2008, to reduce greenhouse gas emissions by 34% by 2020 and 80% by 2050

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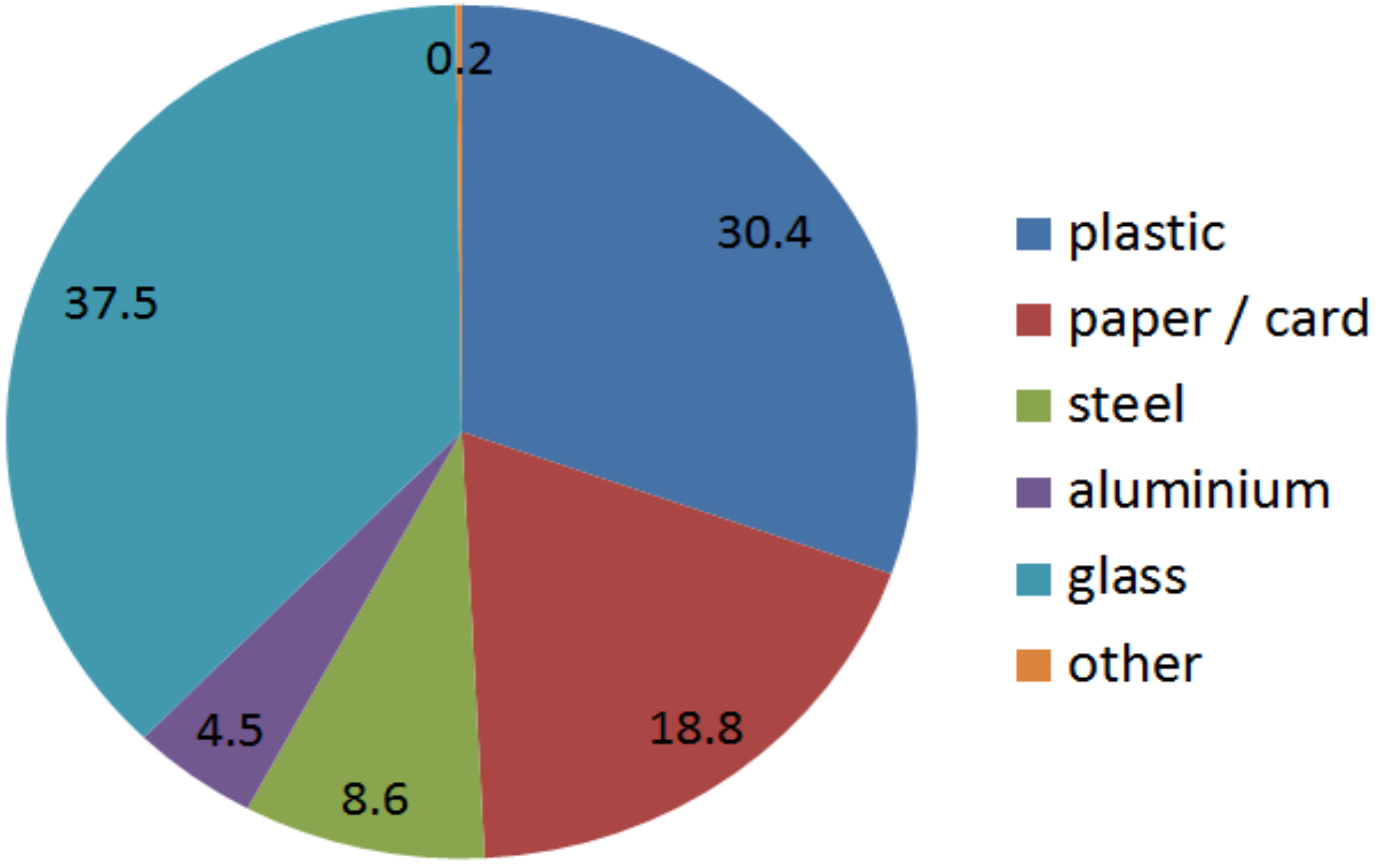
Courtauld Commitment Phase 2 Signatories

Courtauld 2 Packaging: Progress

	2009	2010	2011	% change 2009 - 2011
Weight (million tonnes)				
Primary	2.51	2.43	2.38	**–5.2%**
Single-use transit	0.64	0.58	0.54	**–15.1%**
Total	**3.16**	**3.01**	**2.93**	**–7.2%**
GHG emissions (million tonnes CO_2 eq.)				
Total	5.64	5.38	5.17	**–8.2%**

Primary packaging materials

Courtauld 2 data for 2009 baseline



The packaging maze …

glass

carton

Alu

PET

bag-in-box

pouch

What is WRAP doing?

Direct support to Signatories to deliver the WRAP target

Packaging Optimisation Evidence and Tools

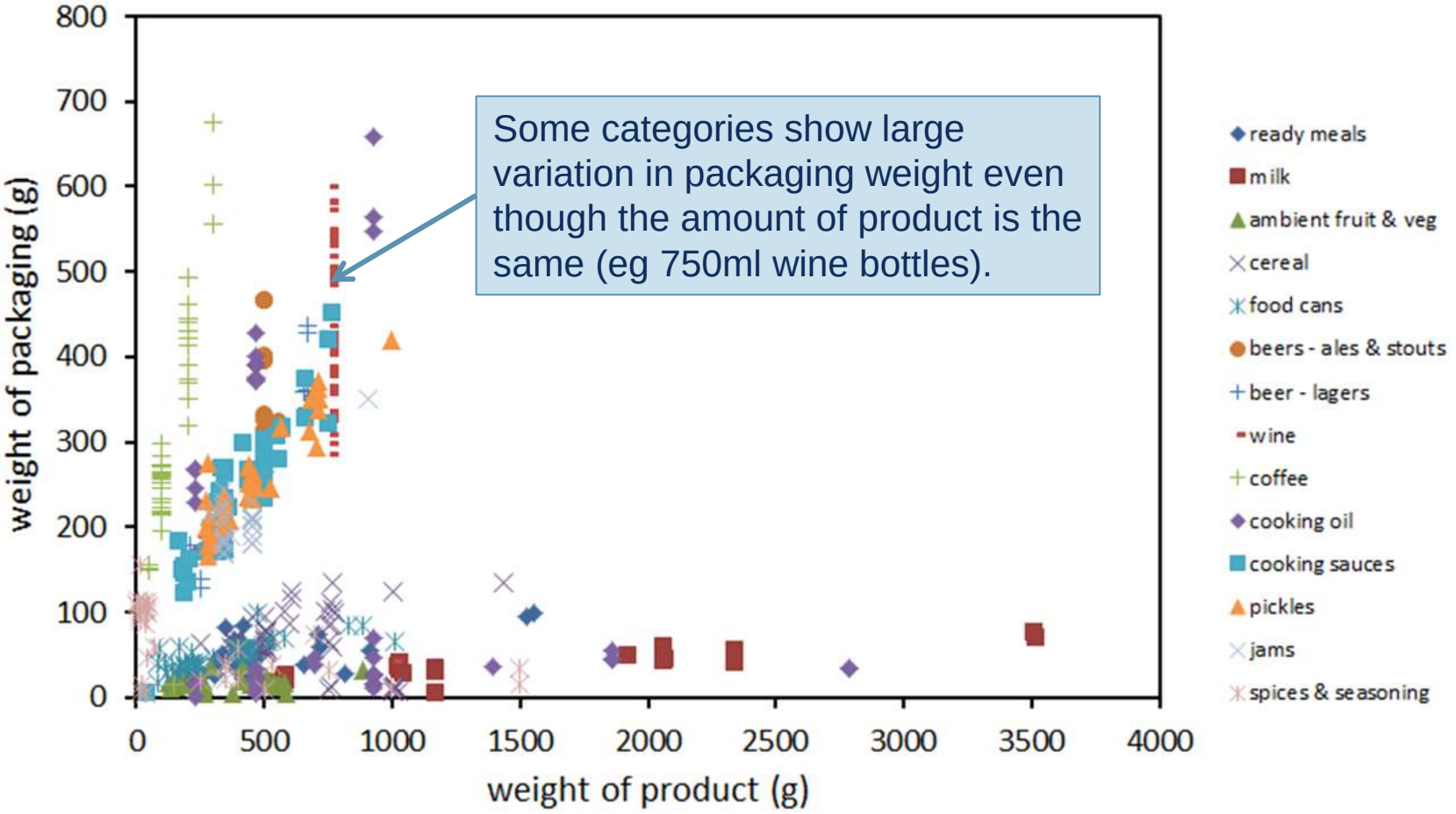
Facilitating change within the industry

REID (Resource Efficient Innovations Database)
SWOP (Shelf Weight of Packaging)
Packaging checklists
Optimising packaging to supply chain
Supply chain product damage mapping
Comparative environmental impact of Product & Packaging

Forums
Workshops
Summits

Shelf weight of Packaging

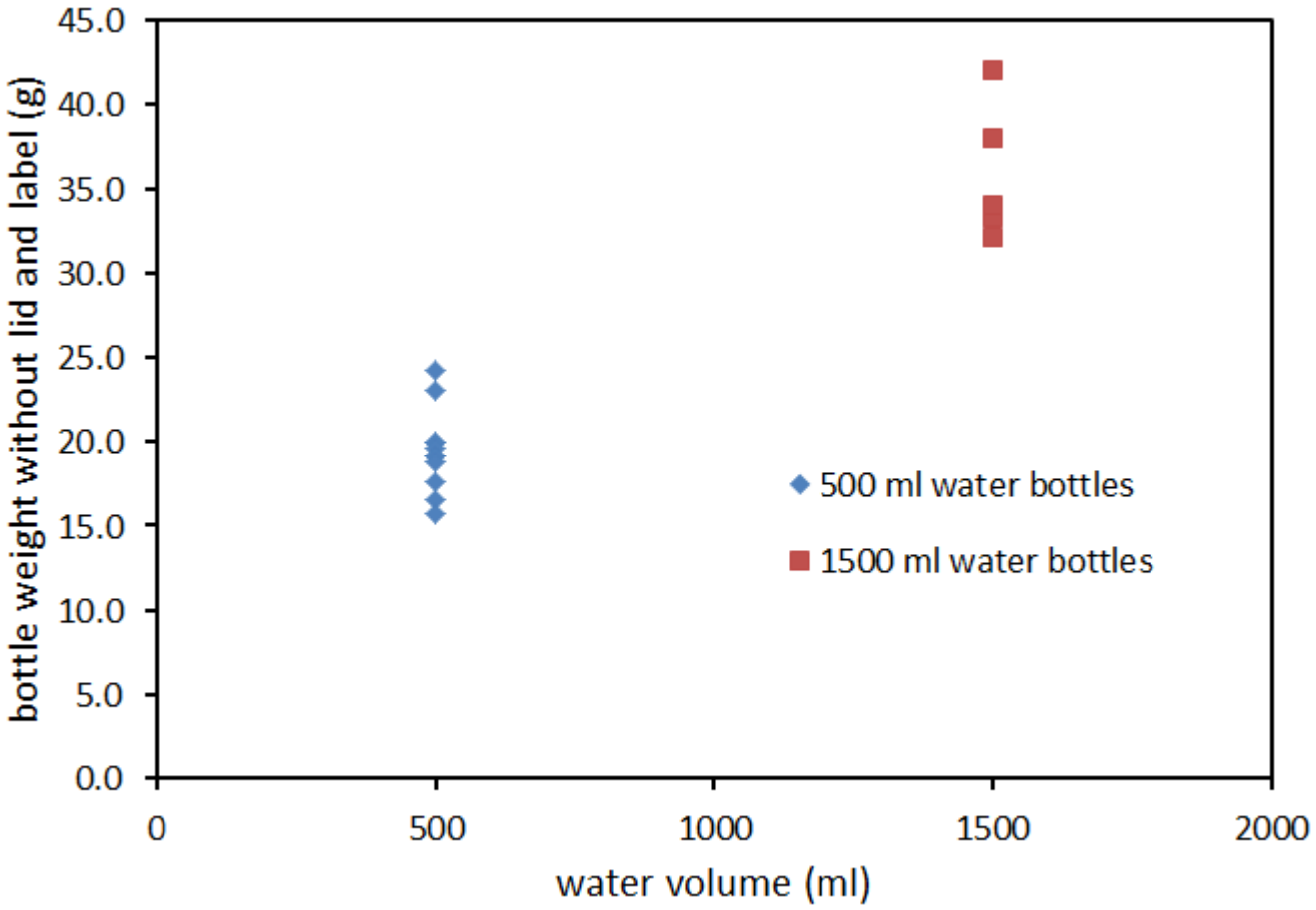
Variation across categories



Opportunities for further reduction

Amount of product (ml)	Bottle weight (g)
330	194
330	204
330	209
330	212
330	215
330	225
330	235
330	242

Shelf Weight Of Packaging (SWOP)



Using the Carbon Ready Reckoner
Worked example

Light-weighting a PET bottle from 19g to 17g and increasing the recycled content from 10% to 25%

Consumer Unit

A consumer unit (CU) is the packaging the consumer takes out of the shop.

ADD A NEW COMPONENT

Existing Components

Component Name	Existing Material	Current Weight (g)	New Weight (g)	Existing Recycled Content (%)	Increased Recycled Content (%)	Existing CO_2e (Kg CO_2e/CU)	CO_2e Reduction (Kg CO_2e/CU)	
Bottle	PET Bottles	19	17	10	25	0.0701	0.0100	E D

Does your product require secondary packaging? (•) Yes ( ) No

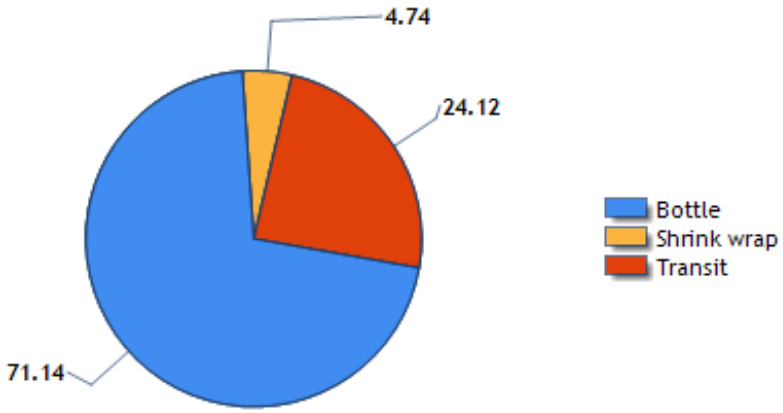
<< Definition

Secondary >>

Pack Comparison

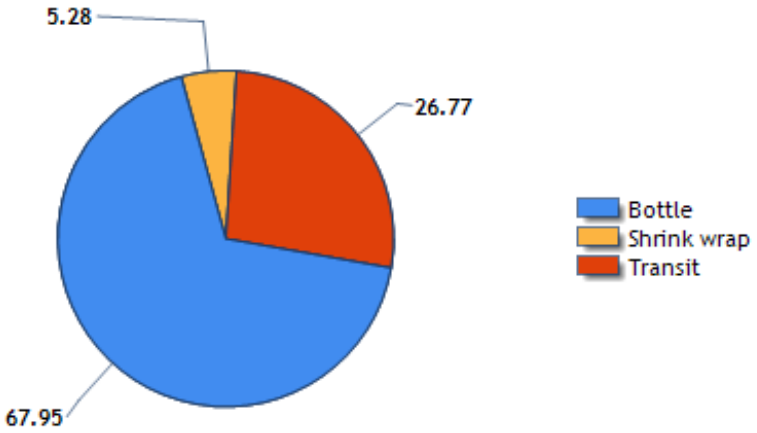
Existing Pack

Product volume per Pack:	**500.00** (g)
Servings per Pack	**1**
Number of Packs per Year	**1,000,000**
Total CO_2e Per Year:	**98,607.96** (kg)
Total CO_2e Per Pack:	**0.0986** (kg)
Total CO_2e Per Serving:	**0.0986** (kg)



New Pack

Product volume per Pack:	**500.00** (g)
Servings per Pack	**1**
Number of Packs per Year	**1,000,000**
Total CO_2e Per Year:	**88,557.53** (kg)
Total CO_2e Per Pack:	**0.0886** (kg)
Total CO_2e Per Serving:	**0.0886** (kg)



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Resource Efficient Innovations Database (REID)

The aim of REID is to showcase resource efficient technologies such as machinery, tooling, materials and design from across the world.

It can help businesses across the retail supply chain to be more resource efficient, which can save them money and reduce their impact on the environment.

www.wrap.org.uk/reid

Search Database

Search

Search

Filter Results

Reset

- Benefits — All
- Product Categories — All
  - [x] Drinks
  - [ ] Food
  - [ ] Home Improvement
  - [ ] Household & Personal Care
  - [ ] Other
- Relevant Materials — All
- Relevant Packaging Formats — All
- Supply Chain Phase — All

Search Results

Showing 19 results

Light-weight 2 litre PET drinks container

A 2 litre PET drinks container has been repeatedly developed in order to achieve a very light-weight design with excellent consumer and recycling benefits.

Innovative barrier technology

Oxygen barrier technology for use in plastic drinks bottles

Light-weight closure for carbonated soft drinks

An improved closure for short-height carbonated soft drinks bottles delivers material savings compared to existing designs

Oxygen scavenging system uses a highly reactive oxygen absorbing compound

An oxygen scavenging system using a highly reactive oxygen absorbing compound

Innovative bottle production

New "Roll 'n' Blow" method of producing thermoformed bottles saves materials and energy

WRAP PET Bottle Categorisation Tool

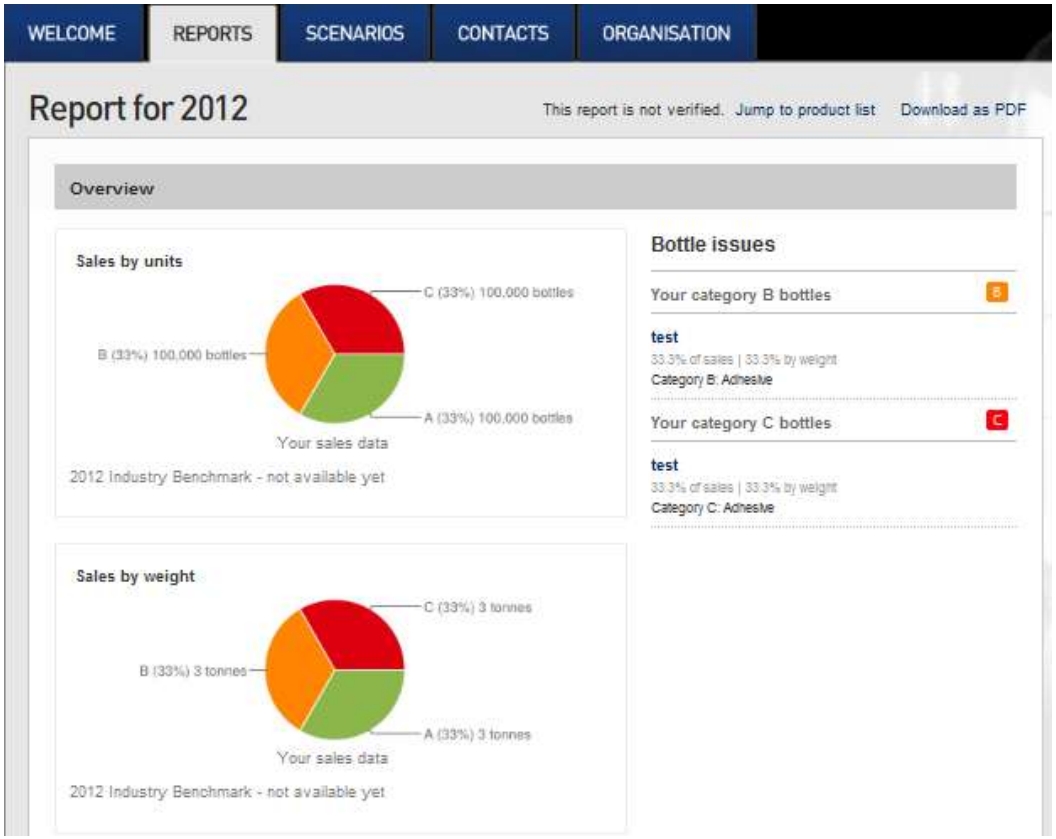
"www.wrap.org.uk/content/pet-bottle-categorisation-tool"

- Categorise according to recyclability
- Tool can simulate what category certain elements are before putting onto market
- Potential to set targets for sales % in cats A, B, C

Category A	Category B	Category C
'Ideal' for the recycling process	Not ideal but not detrimental	Detrimental or disruptive to the recycling process

Recyclability Categorisation – rPET

	Category A	Category B	Category C
Colourants	Clear / no colour / natural; Colour light blue/green or other light colours and tints only	Colour - Strong tints dark blue/ green/brown	Dark or solid colours; Opaque white and others; Opaque black; Metallic colours; and use of fillers.
Barrier coatings & layers	No barrier/coating layers; Plasma coatings e.g. Chemical Vapour Deposition; SiO_x Monox/Monobar; Other blended additives/processing aids; Other PET based carriers	PEN barrier layer (if <3% total bottle weight) Amasorb barrier layer (if <3% total bottle weight)	EVOH / Amasorb / MXD6 Any nylon based barrier layers
Closures	HDPE/ LDPE/ PP		Metals / PS / PVC; Any other materials density >1g/cm^3
Closure liners and seals	No closure liners; HDPE, PP, PP+EVA/EVOH; PE+EVA/EVOH; EVA or EVOH if it floats i.e. density <1g/cm^3	Foamed PET; Paper; Silicone 'swimming' valves (density <1g/cm^3); Any other closures which float after granulation	Metal / PVC / EVA / Silicone / Neck foils of density >1g/cm^3 Any other material of density >1g/cm^3
Labels	No label; HDPE / MDPE / LDPE / LLDPE / PP /OPP / EPS / PET	Paper labels	Pressure sensitive; Self –adhesive labels; PVC / PS / Metallised labels (ie metal foil labels, not labels with metal inking)
Sleeves	No Sleeve; PE / PP / OPP / EPS / foamed PET sleeves with density <1g/cm^3 and showing at least 40% of the bottle. Other films of density <1g/cm^3	PET sleeves; Full body shrink sleeves showing <40% of bottle; Full body shrink sleeves – fully colour printed	Contains any PVC Contains any Polystyrene (PS) Any other materials of density >1g/cm^3
Adhesives	No adhesive; Water soluble in 60 -80 ° C Plastic wrap, minimum glue e.g. lap join	Strong adhesives with paper labels Around 50% of adhesive not removable	Water insoluble (even at elevated temperatures and/or pH); Any non-removable glues
Base Cups	No base cup	HDPE / PP / clear PET	Coloured PET and other plastics density >1g/cm^3
Other components & bottle size	No other components Diameter > 50mm, length >100mm	Diameter 40 – 50mm, length < 100mm	Any polymer with density >1g/cm^3 PVC / PLA / PS / PETG Diameter < 30mm, length < 100mm



PET bottles scenario tool

- highlights opportunities to improve.
- companies have an incentive to increase the recyclability so that the amount and quality of rPET is maximised.

Steel

Format	Split of steel packaging flow onto UK market
Cans	92%
Other	8%

Aluminium

Format	Split of aluminium packaging flow onto UK market
Aerosols	3%
Cans	61%
Closures / lids	3%
Composites	9%
Foil containers / trays	13%
Other	5%
Tubes	2%
Wrappers / foil	4%

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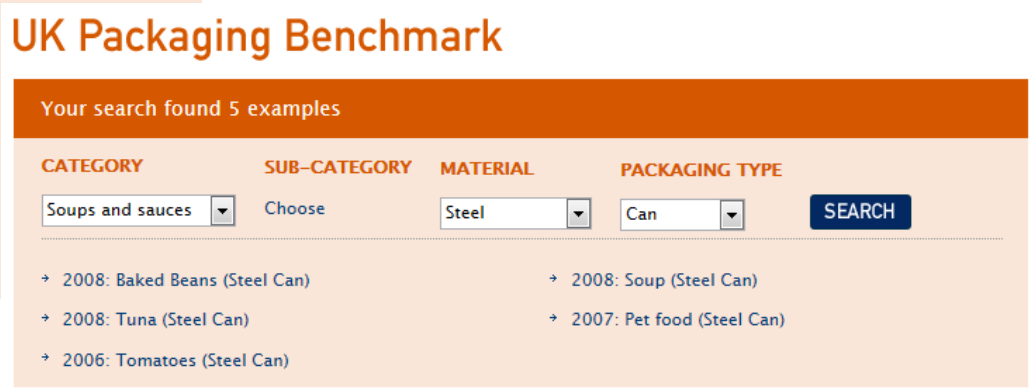
UK Packaging Benchmark



Example from the benchmarking database

CATEGORY	SUB-CATEGORY	MATERIAL	PACKAGING TYPE	
Soups and sauces	Choose	Steel	Can	SEARCH

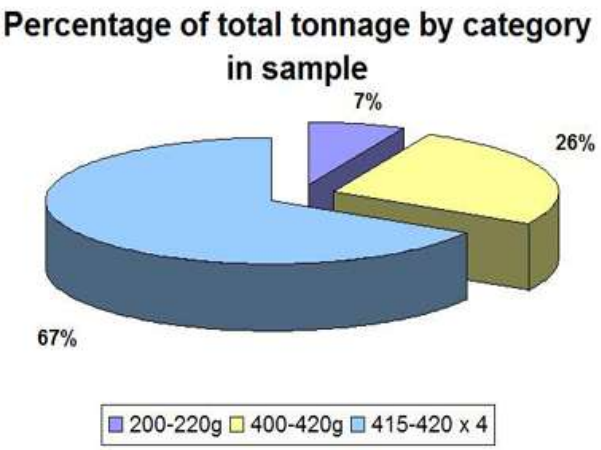
Baked Beans (Steel Can)

UK Packaging Benchmark product analysis – 2008

- Back to search results
- Back to start
- General Data Assumptions

- Specific data assumptions for this Baked Beans report

Product size	Lightest class item weight (grams)	Middle class item weight (grams)	Heaviest class item weight (grams)	% difference between lightest & middle classes
200–220g	37	40	41	10
Paper	1	1	1	
Glass	0	0	0	
Alu	0	0	0	
Steel	36	39	40	
Plastic	0	0	0	
Other	0	0	0	
400–420g	50	52	53	4
Paper	2	2	3	
Glass	0	0	0	



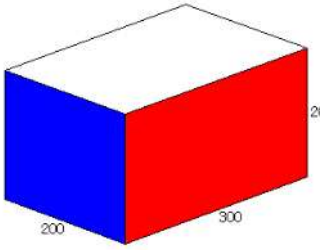
Palletisation

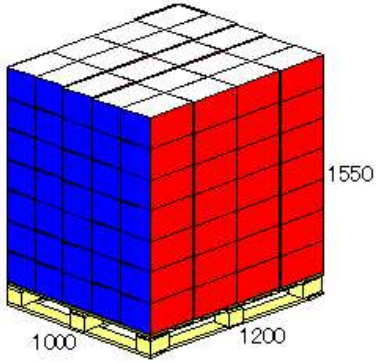
Consider the pallet, as well as the pack.

Modular packaging provides the most optimum palletisation scheme.
Some modular packaging dimensions are shown in the table below. These dimensions are modular for both UK pallets (1200 x 1000mm) & EURO pallets (1200 x 800mm)

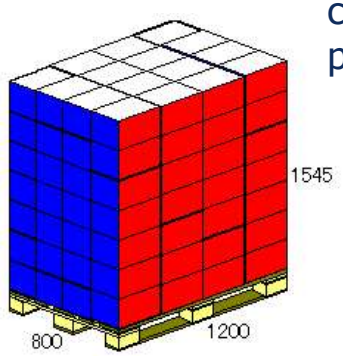
Package size [mm]				
	600 x 100	600 x 133	600 x 200	600 x 400
	300 x 100	300 x 133	300 x 200	300 x 400
	200 x 100	200 x 133	200 x 200	200 x 400
	150 x 100	150 x 133	150 x 200	150 x 400
	120 x 100	120 x 133	120 x 200	120 x 400

An example of optimised pallet scheme is shown below using the following modular dimensions:
300 x 200mm





UK pallet



Euro pallet

In this example, the pallet area coverage for both UK and EURO pallets is 100%

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On-Pack Recycling Label (OPRL)

Helping consumers to recycle more

First scheme in the world to label packaging by what is actually collected for recycling, rather than what is hypothetically recyclable

Example of a multi material pack where there is more than one component and material type.

The definitions of the labels are as follows:

widely recycled
used when 65% or more of local authorities have kerbside collection facilities for that packaging type in their area.

check local recycling
used when 15% – 65% of local authorities have kerbside collection facilities for that packaging type in their area.

not currently recycled
used when less than 15% of local authorities have kerbside collection facilities for that packaging type in their area.

Web: www.oprl.org.uk

WRAP Approach

Collections

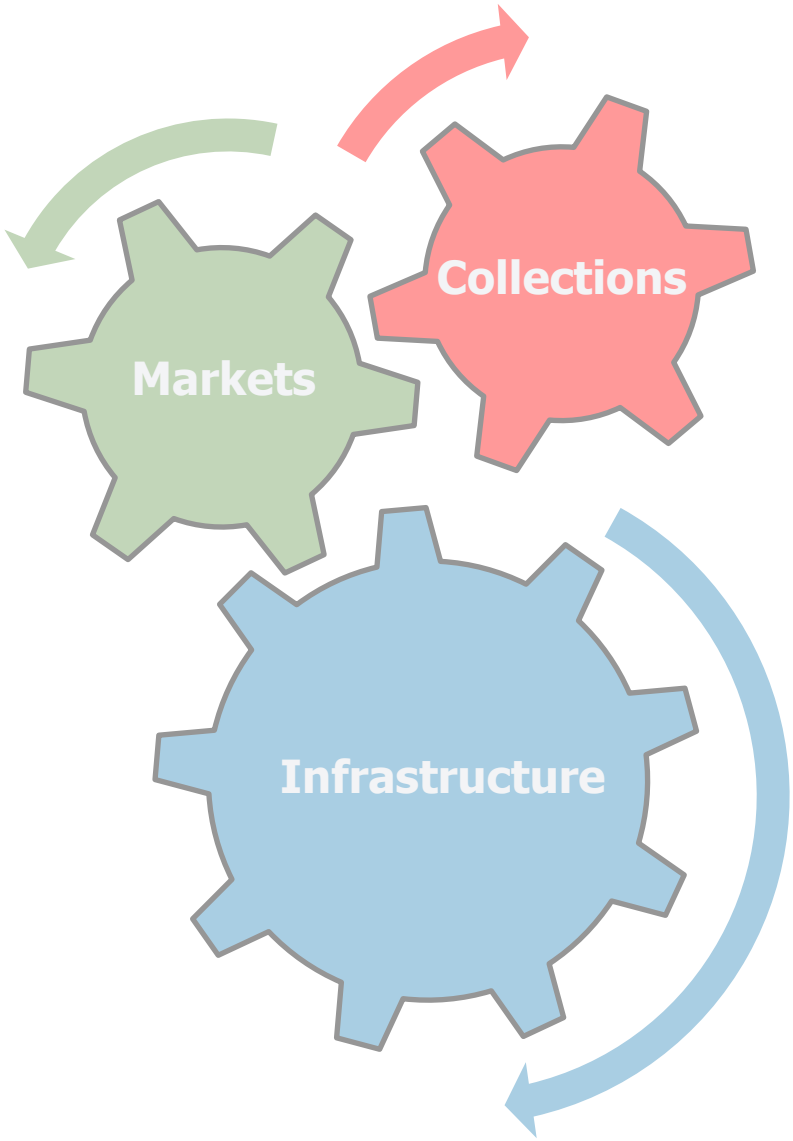
- Ensuring supply of quality material for recycling

Infrastructure

- Establishing the capacity to sort, recycle & reprocess
- Supporting recycling enterprises

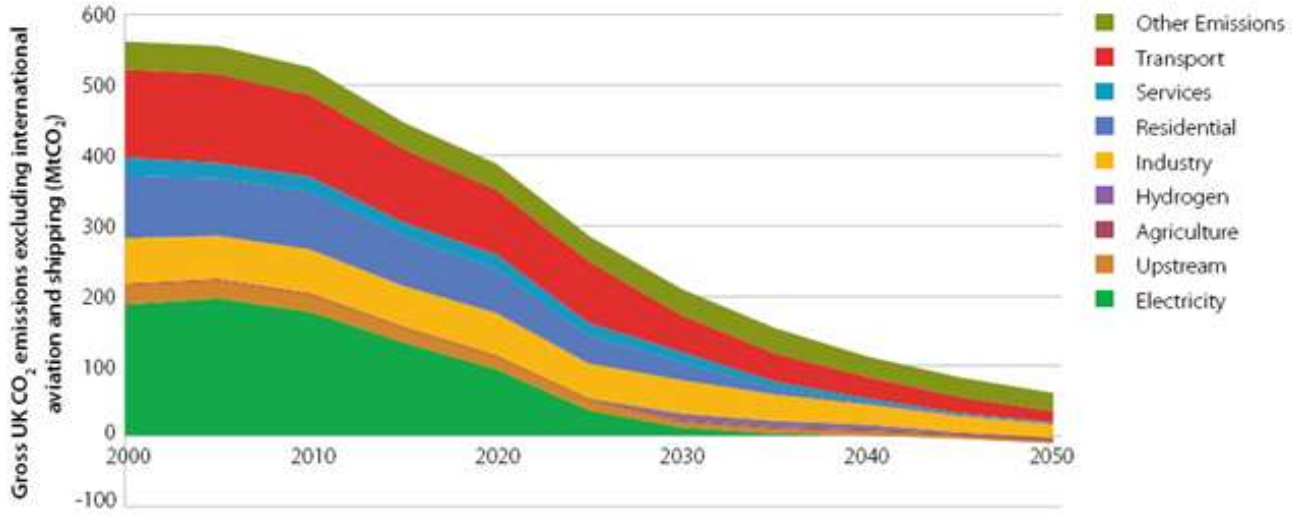
Markets

- Building demand for & confidence in recycled polymers



Entering a period of significant CO_2e reduction

Figure 3.6: MARKAL possible emissions trajectory (2000-2050)

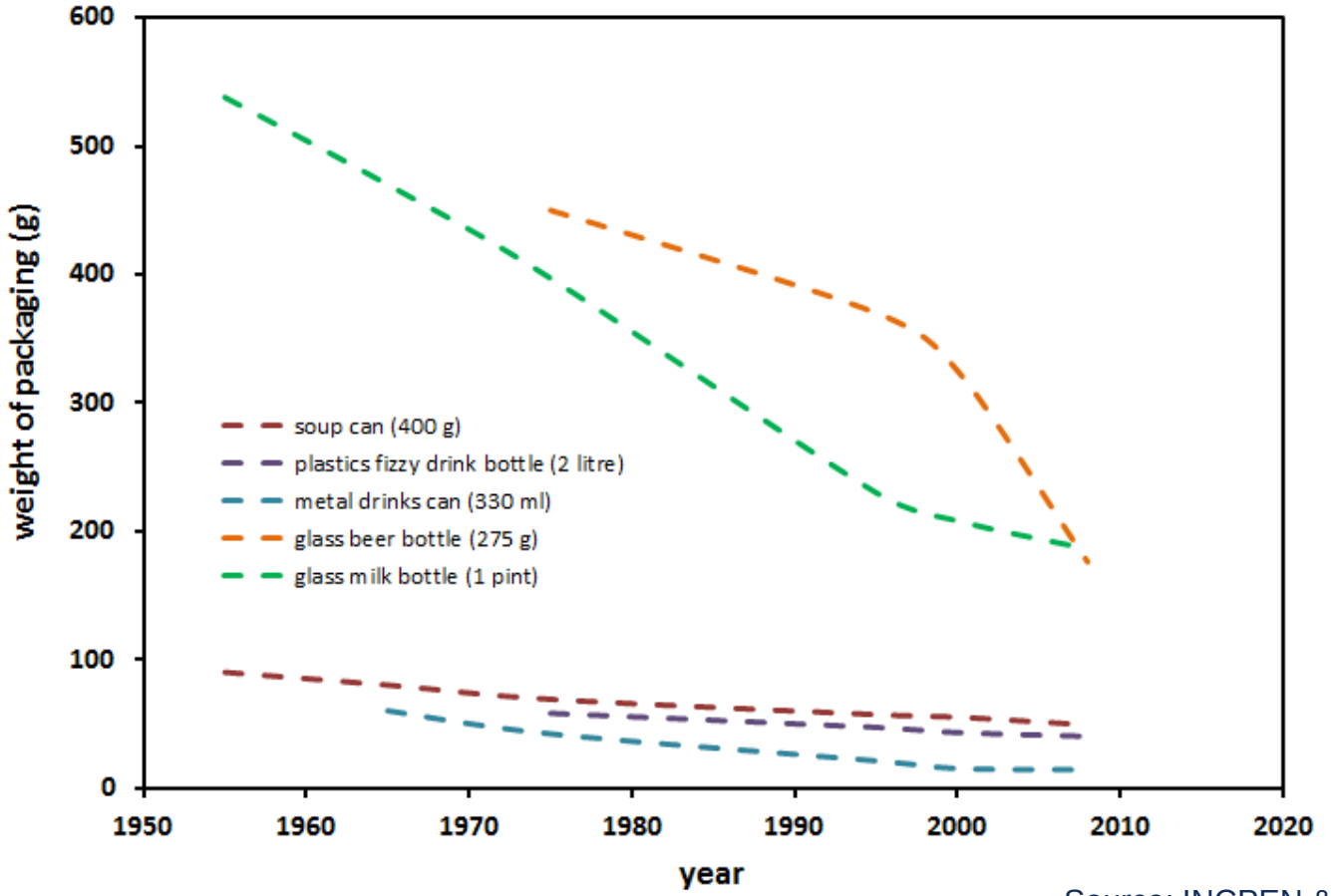


Source: MARKAL modelling by University College London for the CCC (2010).
Note(s): Emissions are CO_2 only, i.e. agriculture excludes the much larger contribution of non-CO_2 emissions; the 'other' emissions category is comprised mainly of industrial non-combustion emissions, e.g. process emissions from production of cement and iron/steel; 2010 emissions are high relative to latest outturn as the baseline does not include impacts of the recession.

From the UK Climate Change Committee "Fourth carbon budget"

Historical perspective

Indicative packaging for some common products

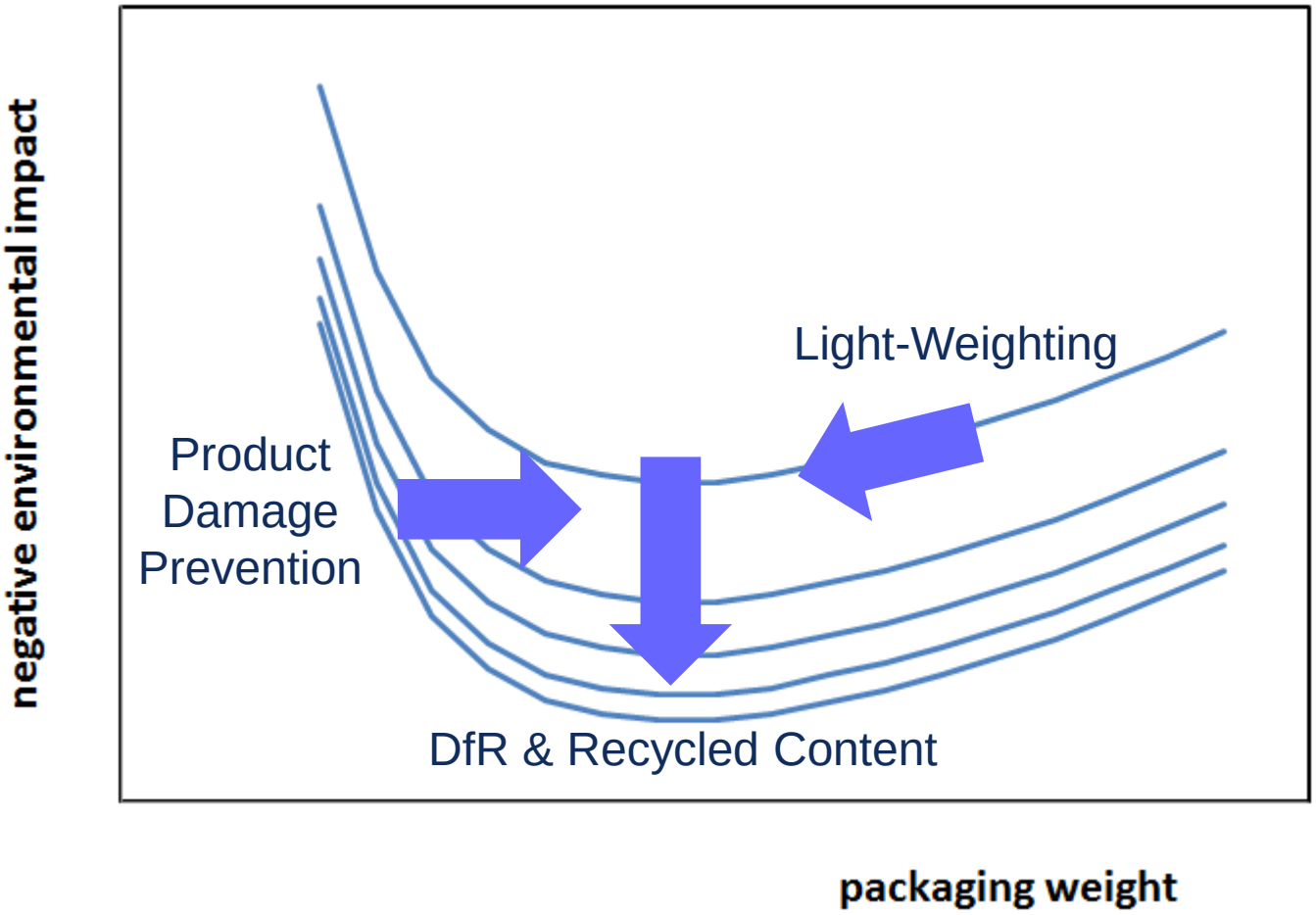


Source: INCPEN & various

Trends in the market

- Shorter runs and more customisation
- Continued evolution of the private label
- Structural innovation:
  - shape and visual hierarchy
  - flexibility
- Materials substitution
- Integration of branding positioning and sustainability messages
- Innovative value-added retail solutions
- Rapid prototyping of packaged product & SC system
- Compression of the design approval process

New sources of innovation



Courtauld 3 Commitment (2013-2015)

WRAP has worked closely with CC2 signatories and the UK governments, to develop initial targets for the Courtauld 3 Commitment. The targets are still under consideration, and will be announced in spring 2013 when the new commitment is launched.

The grocery sector has made significant progress under Courtauld 1 & 2 to reduce food, packaging and supply chain waste in the UK and the third phase targets will continue to build on achievements to date.

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