Case study: Colour-separated collection of glass for re-melt

**Case study**

Lightweighting and using recycled content in packaging can deliver environmental and commercial benefits

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**Soft drinks packaging in a changing climate**

Lightweighting and using recycled content in packaging can deliver environmental and commercial benefits

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Choosing which pack format to use for soft drinks has mostly been down to consumer appeal, availability and costs. Today, environmental considerations have an equally important role as companies make decisions between using plastic or glass bottles, aluminium cans or cartons.

The drinks industry has always looked for ways to make packaging more resource efficient but has recently made a step change through collaborative work with WRAP (Waste & Resources Action Programme) and actions taken by Courtauld Commitment signatories. However, WRAP estimates that there is still potential to further reduce the weight of soft drinks packaging by up to 20% across some parts of the sector.

Achieving this represents potential material, logistical and cost savings throughout the supply chain – even for modest packaging reductions – that could have a significant effect on the triple bottom line, with associated savings to be gained in carbon, water and energy.

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**Key facts**

- 13.9 billion litres of soft drinks were consumed in the UK in 2008;
- Around 700,000 tonnes of soft drinks packaging ends up in the UK waste stream each year of which about 320,000 tonnes comes from households;
- There is potential to reduce the weight of soft drinks packaging by up to 20% across some parts of the sector.

**Courtauld Commitment**

The Courtauld Commitment is a voluntary agreement between WRAP and major UK grocery organisations that supports less packaging and food waste ending up in household bins. It is a powerful vehicle for change and in 2008 has led to zero growth in packaging, despite increases in sales and population. See [www.wrap.org.uk/courtauld](http://www.wrap.org.uk/courtauld).

**Lighter weight containers – the potential**

Within the waste hierarchy, reduction or removal of packaging – without risking damage to the product or brand identity – will deliver the greatest environmental and cost savings, and should always be the first option for pack designers, manufacturers, brands and retailers. Ensuring packaging is recyclable and increasing its recycled content are the next steps.

This case study highlights a number of WRAP supported projects which provide an insight into the successful optimisation of some soft drinks containers (with a focus on primary packaging), and how the sector has responded to the demand for smarter packaging.
**Plastic packaging**
A number of large brand owners such as Coca-Cola Enterprises (CCE) and Britvic have made high-profile changes to their PET (polyethylene terephthalate) packaging – boosting their environmental profile and saving on valuable raw materials. Another is Danone Waters UK Ltd, which has benefited from lighter weight designs for its Evian and Volvic water bottles.

**Cartons**
Lightweighting cartons and closures, and sourcing paper packaging from sustainable forests, continue to increase. Courtauld Commitment signatory Innocent Drinks has reduced the amount of paper used in their 1 litre (l) carton by 8%, saving nearly 100 tonnes of paper (over 2,000 trees) and around 250 tonnes of carbon per year. Recycling of cartons is becoming more widespread in the UK, with more than 65% of Local Authorities collecting liquid cartons through bring banks.

**CCE** lightweighted its range of 500ml plastic PET bottles by reducing the overall packaging weight from 26g to 24g, representing a material saving of 8%. This process was rolled out across UK sites in 2007 and 2008. The change has affected 700 million bottles annually – including Coca-Cola, Diet Coke, Fanta and Sprite – saving approximately 700 tonnes of PET each year.

**Britvic** introduced a new lighter bottle in 2008 for its one litre Robinsons squash – the UK’s best selling brand of squash. The bottle is 2g lighter than the previous container, saving over 300 tonnes of PET each year, and reducing the energy needed to manufacture the bottle by 5%. The changes have also enabled 25% more cases of Robinsons to be loaded onto pallets, reducing lorry loads, fuel costs and carbon emissions.

**Artenius PET Packaging UK**, in conjunction with Tecso SA (France) and Artenius R&D Brecht, researched the production of super-lightweight plastic packaging for 330ml and 500ml still water bottles. The trial, supported by WRAP, examined the possibility for a sub-10g container for both pack sizes.

Following the production of a prototype and consumer and technical testing, the trials suggested that a monobloc form-fill-seal combination system could facilitate the production of a super-lightweight bottle for still drinks. This could potentially provide a material saving of around 30 – 40%, and an opportunity to make considerable financial savings.

These super-lightweight bottles could provide an excellent opportunity in certain sectors of the market, such as children’s lunchbox drinks, however it would require an initial investment in production facilities.

**Aluminium cans**
Research undertaken in 2007 as a result of a WRAP, CCE and Beverage Can Makers Europe partnership demonstrated there is potential to lightweight aluminium carbonated cans by 5% – and potentially more.

This is achieved by not only reducing the gauge of the can body and end, but also by modifying the design of the can. The widespread production of lightweighted soft drinks cans has already begun and as a result, it is anticipated that the EU can industry will save almost 15,000 tonnes of aluminium each year, and make significant cost savings.

"Robinsons has come a long way in reducing its impact on the environment but we remain focused on further packaging reductions as well as reducing energy and water use across all Britvic brands and at all our manufacturing sites.”
Paul Moody, Chief Executive of Britvic

Lightweighting aluminium drinks cans by 5% across the EU will save 88,000 tonnes of CO₂ – equivalent to taking 28,000 cars off the road.
**Glass bottles**

One of WRAP’s GlassRite projects, managed by Faraday Packaging Partnership, brought together retailers, brands, producers, fillers and glass manufacturers to encourage a move to using lighter weight glass bottles for soft drinks.

A number of different products were successfully lightweighted as a result of this project, saving over 10,000 tonnes of glass each year and 3,150 tonnes of CO₂. This includes mineral water bottles used by the container merchant AE Chapman and Malvern Spring Water as well as Coca-Cola’s iconic contour bottle.

AE Chapman & Son Ltd, together with glass manufacturer O-I, successfully lightweighted eight variants of 250ml, 330ml, 500ml and 750ml mineral water bottles at O-I’s Harlow and Alloa production sites. They ensured the external dimensions of diameter, label panel height and neck finish were unchanged to minimise any visible difference to existing customers. This was crucial to ensure that the bottles could be used on a variety of different filling lines.

Following the design changes, the 250ml bottle was reduced from 210g to 190g, the 330ml by 30-40g, the 500ml by 40-60g and the 750ml by 50-70g. In total, this led to a saving of 1,790 tonnes of glass per year – clearly demonstrating the business benefits and adaptability of this approach.

CCE reduced the weight of its iconic 330ml contour bottle by a fifth, which led to savings of over 3,500 tonnes of glass and an estimated 2,200 tonnes of CO₂ each year. All 330ml glass bottles of Coca-Cola, diet Coke and Coca-Cola Zero are now made to the new specification, weighing 20% less – reduced from 263g to 210g – but retaining dimensions, quality and strength.

The new lightweight ‘ultra’ bottles were developed by Ardagh Glass using design software that helps determine the stress points and optimum weight of a glass bottle, allowing technicians to create both the strongest and lightest viable design.

Ardagh also lightweighted a number of other glass bottles for CCE, including the 750ml Appletiser and 330ml Fanta and Sprite bottles, achieving over 800 tonnes of raw material savings.

“We are looking at ways to reduce the impact of our business on the environment at every level. Our commitment to this is such that we are prepared to adapt even our most precious assets, including the glass Coca-Cola contour bottle.”

Gareth Snowdon, Supply Chain Project Manager for CCE
Britvic has reduced the amount of glass in bottles of its juice drink J2O. The new 275ml bottle is 20g lighter, with each bottle reduced from 200 grams to 180 grams, saving around 4,000 tonnes of glass per annum, equivalent to 20 million bottles of J2O a year.

The new design has also led to improvements in filling line efficiencies, due to the bottle being lowered in height, as well as energy savings as less glass is used during bottle blowing. These latest savings are in addition to changes that were made to the J2O bottle in 2004, which reduced the bottle weight by 26g, saving an estimated 5,000 tonnes per annum.

There is no visible change to the J2O bottle as the volume remains the same, despite the height having been reduced by 5mm. The bottle has also maintained its durability and strength ensuring that it can be stacked and stored as usual, which is important for Britvic’s customer needs.

Light, yet strong
It is sometimes assumed that lighter weight glass bottles will suffer higher rates of failure, as it could be perceived that they are weaker. However, technical tests on new lighter glass bottles have shown that the ‘Narrow Neck Press and Blow’ process for manufacturing can result in a more even glass distribution than traditional methods, which more than compensates for the weight reduction. In fact this manufacturing method often results in stronger bottles than their heavier counterparts.

Using recycled content
Improving the environmental benefits of drinks packaging also includes increasing the use of recycled content, which will help reduce CO2. For example, specifying 50% rPET (recycled PET) content will reduce the CO2 equivalent of a bottle by approximately 25%.

In addition, WRAP-led research has also shown that consumer attitudes towards recycled plastic packaging are favourable, and that many shoppers would prefer to buy products using recycled packaging over those that did not. Therefore, businesses could benefit from responding to this demand.

Innocent Drinks is one company to have made significant progress in reducing its carbon footprint by leading the way in terms of using rPET. In September 2007, Innocent became one of the first brands in the world to put drinks on the shelf in 100% recycled plastic bottles. It started by using rPET for four of its smoothie flavours; however, the company extended this in January 2008 to produce all of its recipes in the 100% rPET bottles. In making the change, along with light-weighting the bottle, Innocent reduced the carbon impact of packaging by 55% and carbon emissions by 1,000 tonnes during 2008.

Sainsbury’s – Since March 2008 Sainsbury’s Taste the Difference 250ml, 500ml and 1l fresh chilled juices have been packaged in 100% recycled plastic bottles – helping to save 375 tonnes of virgin plastic per year.
Thinking out of the box

Lightweighting and using recycled content are important factors to consider when making packaging more efficient but so is re-thinking how a product can be used in the first place. Developments such as concentrates, re-use and design for recyclability are also proving successful in reducing the environmental impact of products and their packaging and generating cost savings throughout the supply chain.

Tesco, with Princes Soft Drinks, identified that the same flavour delivery and ‘dilute to taste’ could be achieved using double concentrated squash, effectively halving the amount of concentrate required.

Bottle sizes were traditionally 1, 2 and 3 litres, but these were replaced by new 750ml and 1.5l bottles, made from 100% rPET and using environmentally friendly inks. This double concentrated squash has meant that the new 1.5l size has generated a bottle weight saving of 35g (or 46%), saving approximately 469 tonnes of PET per year.

Considerations when making packaging choices

Each packaging material has its merits and is best suited to a particular combination of environmental, brand and consumer needs. When assessing different pack format and material options – such as plastic, aluminium, glass or cartons – consider the following:

- Work with suppliers to identify the performance specification required for packaging and create fit-for-purpose solutions which meet consumer needs.
- Consider primary, secondary and tertiary packaging together to deliver benefits and reduce waste generated throughout the supply chain, including manufacturing, distribution, back-of-store and consumer stages.
- Is the optimum amount of material being used and does it offer adequate protection and minimise product damage?
- How much recycled content does it contain and could it contain more?
- Could the system of delivery be different, such as concentrates or self-dispensing?
- Can the packaging be re-used, re-filled or returned?
- Can the packaging be recycled? Use clear on-pack labelling.
- Can you reduce household waste and help meet the needs of different consumer groups through portion sizes, re-closable or divisible packaging?
- Tell your customers about the good work that you are doing.
Design for recyclability – on-pack labelling

Leading brands and retailers are taking steps to ensure that consumers have clear and consistent advice when it comes to recycling packaging. Led by the British Retail Consortium, with technical support from WRAP, a UK on-pack labelling system has been developed to ensure that retail packaging is clearly marked with simple recycling instructions.

The majority of drinks packaging is labelled as widely recycled under the scheme. This presents a clear opportunity to label packaging as such and to drive up recycling rates and support closed loop systems. See www.oprl.org.uk for details about the scheme and the benefits of joining.

Future directions

Soft drinks packaging is varied and will continue to see new packaging materials and formats introduced in the coming years to respond to dietary, functional, consumer and environmental demands. The key question to ask is, does the new packaging introduced improve the overall environmental impact of the product and its associated supply chain, and could the system of delivery to the consumer be adapted – for example, the in-store self-dispensing of soft drinks. WRAP research shows that a radical shift in the way drinks could be delivered to the consumer in store is possible within the current UK market. HydraChill is about to trial self-dispensing water machines at rail and bus stations in London and also has them in place at museum and sport venues in Newcastle and Cardiff.

Further information

To find out how your company could achieve environmental and commercial benefits by optimising soft drinks packaging, visit our website – www.wrap.org.uk/retail to see full reports, case studies and support tools, or email us at retail@wrap.org.uk.

You can also sign up to the WRAP e-newsletter at our website which contains the latest packaging innovation news.