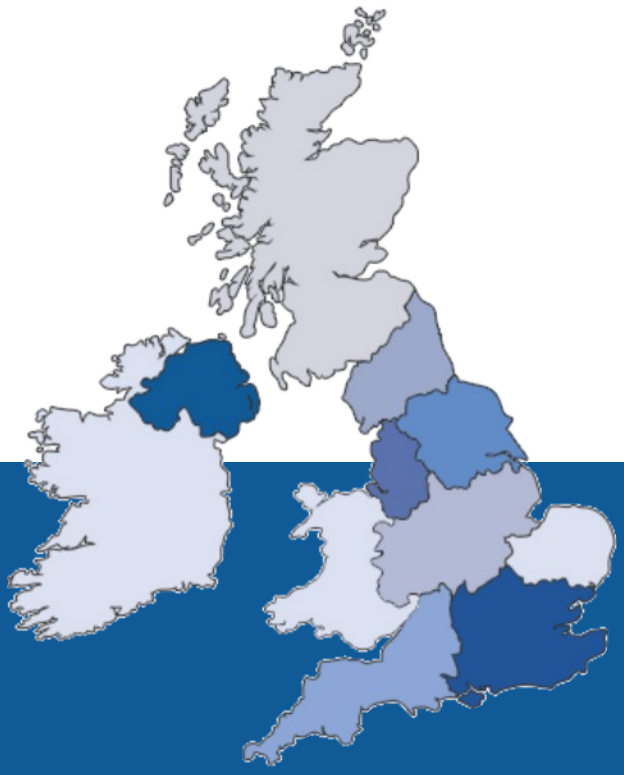
RECOUP
RECycling Of Used Plastics Limited

UK Household Plastics Collection Survey



2013

UK Household Plastics Collection Survey 2013

This work was commissioned by Recoup and sponsored by Nampak Plastics, Indorama Wellman Recycling, GlaxoSmithKline and RPC using data gathered from UK Local Authorities and waste management companies. The content and analysis contained in this document is based on the information received.

While every effort has been made to ensure the accuracy of the contents of this report, Recoup can accept no responsibility or liability for any errors or omissions. Opinions expressed and recommendations provided herein are offered for the purpose of guidance only.

This document has been researched and written by:

Steve Morgan, Recoup Technical Manager

RECOUP

RECycling Of Used Plastics Limited

Recoup (Recycling of Used Plastics Limited)

1 Metro Centre, Welbeck Way, Woodston, Peterborough, UK, PE2 7UH

t: +44 (0)1733 390021 e: enquiry@recoup.org w: www.recoup.org

Recoup is the leading authority on plastics recycling, providing expertise and guidance to a wide range of clients and members across the plastics supply, use and recycling chain. Established in 1990, Recoup is a not for profit organisation built on a network of members (including Nampak Plastics, Indorama Wellman Recycling, GlaxoSmithKline and RPC).

Recoup deliver research, project management and policy review activities for its members and clients, working to maximise plastics recycling by stimulating the development of sustainable plastics waste management practices. This includes the improvement of plastics collection and sorting activities across the UK, undertaking bespoke research to identify good practices and remove barriers to the adoption of efficient recycling systems.

@recycleplastics

Recoup

Contents

… Plus

Sponsors

Nampak Plastics is the UK's leading plastic milk bottle manufacturer, producing some two billion bottles every year. Nampak's strong environmental credentials lie at the heart of its business and include a total commitment to the principles of recycling and sustainability.

Nampak, along with its partners, produced the world's first post-consumer waste recycled milk bottle, the Infini bottle. It continues to lead the industry in sustainable milk packaging through the inclusion of at least 15% recycled high density polyethylene (rHDPE) in all the milk bottles it produces in the UK and Northern Ireland, moving up to 30% rHDPE in early 2014.

Over the last 12 months, Nampak's manufacturing team has been able to push boundaries even further. The first breakthrough came when Nampak created the world's lightest four-pint milk bottle, a version of Infini weighing just 32g – a 20% saving on a standard plastic milk bottle.

A further breakthrough and world first, occurred recently when Nampak trialled, tested and sold the first Infini bottle to include up to 30% rHDPE. These factors combined will herald material savings of 35,000 tonnes of material each year, making them significant developments not just for Nampak, but for the packaging industry as a whole.

Nampak Plastics
packaging excellence

James Crick, a Director at Nampak, commented: "The Infini bottle has been responsible for a paradigm shift in milk packaging and Nampak is preparing to take Infini further with plans for rigorous testing on milk bottles containing up to 50% rHDPE in the future.

"Adding to this, recycling levels of HDPE are high, at 77%, and through closed loop recycling this can be processed into rHDPE for use in new bottles. In replacing virgin material with recycled content, Nampak is helping to divert waste from landfill.

"To enable recycling rates to increase further, it is of fundamental importance that the government encourages investment in recycling and that both Local Authorities and consumers maintain their commitment."

Nampak has been a Recoup member company since 2000 and James Crick sits on the organisation's Board.

Sponsors

Post collection, bales of plastic bottles or PET (Polyethylene Terephthalate) bottles are delivered to our flake production facilities at Verdun and Spijk, where the bottles are sorted by colour and material type. Indorama Wellman Recycling recycles 90 bottles per second.

The sorted bottles are ground into flake, washed, rinsed and dried. The combined capacity of our two flake production facilities at Verdun and Spijk is 75,000 tonnes of flake per annum.

Recycled PET flakes are then used for the production of packaging products such as bottles and thermoformed sheet, and also used at our fibre production facility in Cavan, Ireland, where the flake is used as the raw material to produce polyester staple fibre.

Indorama Wellman has the ability to recover up to 100% of polyester components from end-of-life products. Products developed from Indorama Wellman Fibre can be re-introduced into the raw material stream and once again made into Indorama Wellman Fibre.

Sustainable Benefits of Processing Post-Consumer PET Flakes from Indorama Wellman Recycling

- 2.5 billion post consumer bottles recycled annually
    - Equivalent to 200,000 barrels of oil saved annually
    - Eliminates 300,000 tonnes of harmful air emissions
- Carbon footprint is 4 times lower than virgin PET
- Suitable for closed loop recycling uses (B2B)
- Based on over 20 years of recycling and sustainable experience
- Traceability of raw materials
- Certification to confirm maximum recycled content

Sponsors

Environmental sustainability is a priority for GSK. The effects of climate change and water scarcity could undermine hard-won improvements in global health, and the natural resources we rely on to produce our medicines and other products are becoming scarcer and more expensive. Our stakeholders expect us to manage our environmental impacts responsibly.

By reducing our footprint, using resources more efficiently, and working with others to tackle these challenges, we can reduce costs, build competitiveness and create trust in our business.

We have set ambitious goals to reduce carbon, water and waste across our value chain – from our use of raw materials and the impacts of our suppliers to the footprint of our labs and factories, and the use and disposal of our products by patients and consumers. To meet these goals, we must involve our employees and partners.

Further detailed information about our environmental sustainability strategy and progress can be found at http://www.gsk.com/responsibility.html

Our Commitments

- Reduce our overall carbon footprint by 25% by 2020 (vs 2010) and have a carbon neutral value chain by 2050
- By 2020 reduce our water impacts across the value chain by 20% (vs 2010)
- By 2020, reduce our operational waste by 50% (vs 2010)

Packaging Example

- We continue to recycle PET from packaging trays used to deliver components to our sites at Ware, UK, and Evreux, France. This means we purchase less recycled PET on the open market to make Ribena bottles which we make using 100% recycled PET

Sponsors

RPC – PRO-ACTIVELY PROMOTING THE RECYCLING OF PLASTICS

RPC Group is one of Europe's leading rigid plastics packaging manufacturers. As a market leader the company has always been pro-active in promoting the many sustainable benefits of plastics packaging, focusing on areas such as its light weight, product protection and recyclability.

In 1990, RPC was one of the first plastics packaging manufacturers in the UK to highlight the recyclability of the material. In association with Northamptonshire County Council, collection bins for used plastic containers were established at one of the council's Household Waste centres. This became a forerunner to the many plastics collection and recycling schemes that now operate throughout the country.

More recently, RPC has focused on promoting a wider understanding among fillers, retailers and end-consumers of the many different types of plastics that can be recycled. These include packs such as pots, tubs and trays, which are made of a variety of plastics (PP, HDPE, PS and PVC) and which originally contain a variety of food and non-food products. This has necessitated the targeting of new applications where this valuable source of raw material can be effectively used.

As an example, RPC has been working with AkzoNobel on the use of 25% post-consumer recycled (PCR) material in PP paint containers for the Dulux Matt and Silk Colours ranges. The significance of this development was recognised by the pack winning a prestigious Green Apple environmental award.

Another initiative with AkzoNobel are custom-moulded tester pots for the Cuprinol Garden Shades range, where the container is blow moulded in 100% recycled HDPE and the cap and applicator brush stem injection moulded using 50% recycled PP.

RPC is also currently working with another customer in the industrial sector which will shortly see the launch of a 20 litre large container in 100% recycled HDPE.

These applications demonstrate that there is already healthy demand for these types of recycled plastics. What is needed therefore is both to create greater understanding of plastics' recyclability and to encourage the collection of more used material.

Recently RPC has linked up with one of the UK's leading polymer recyclers Regain Polymers to raise awareness of plastics' recycling capabilities among manufacturers and end users. The two companies have produced a You Tube video showing how a margarine tub is recycled to be used to make a new paint container (http://www.youtube.com/watch?v=W9_W_mVSx6E).

RPC will continue to work with RECOUP and other industry bodies to promote plastics recycling and help achieve even better recycling rates.

Foreword

Welcome to the 2013 edition of the Recoup UK Household Plastics Collection Survey. Once again the team and I have welcomed the level of information and views provided by so many of the 400+ UK Local Authorities contacted. Year on year, this support has allowed us to gain an unparalleled insight into the real data, trends and opinions behind UK household plastic recyclables collections. In turn we can provide this free report to all stakeholders to inform and benchmark plastic recycling activities.

Plastics packaging recycling targets have attracted much attention in the past year. Putting specific numbers to one side, we know that plastics recycling is a major success story, but there is also still much more potential to realise. It is fundamental to ensure that the collection and handling systems are affordable, sustainable, and that the material provided to reprocessors is of an acceptable quality.

We recognise that consumer education is a key driver to behavioural change and to increasing household plastic recycling rates. Consumers need clear guidance on which plastics to recycle, why there are limitations, and evidence of how their actions are having a positive impact. Recoup are working with a number of key organisations to initiate the development of a wide reaching communications initiative to achieve more consistency in consumer messages, and to increase the quantity of household plastics collected for recycling.

There is a need to further increase plastic recycling, but also to minimise plastic to landfill. This leaves scope for the development of recovery and chemical reprocessing options where more traditional recycling options are not practicable, cost effective or environmentally viable.

Equally important are the wider discussions stimulated by the European green paper on plastics, and the expected review of European packaging recycling targets. There is a necessary shift towards better use of resources and the development of circular economies. Creating a better understanding of the true impact of resource use, and making more efficient use of the resources that we have should lead to a stronger plastic value chain. If the principles of resource security are used to develop policies and plans, it will lay the foundations for long term sustainable growth and create a pathway to a successful green economy. Plastics are a valuable and potentially circular resource.

I would like to thank all the Local Authority recycling scheme managers and their service contractors who took the time to respond to our requests. I would also like to acknowledge the sponsorship from Nampak Plastics, Indorama Wellman Recycling, GlaxoSmithKline and RPC, which has allowed us to cover the costs of completing this work.

Stuart Foster, Chief Executive Officer, Recoup

Key Data

New Plastics Packaging Consumption Data

- **2,535,000** tonnes of plastics packaging consumed in the UK, of which **1,194,420** tonnes are from households

Household Plastics Packaging Collected

- Total of **440,401** tonnes collected
- **316,054** tonnes of plastic bottles
- **124,347** tonnes of pots, tubs and trays
- **88%** from kerbside schemes

Nation and Region Collection Levels

- **Wales** have highest kerbside plastic bottle collection rate per household with 15 kg collected per household in 2012
- The **South East** collected the largest amount of plastics packaging with 35,551 tonnes
- The **East Midlands** recorded the biggest increase from 2011, collecting 3,885 more tonnes
- **Scotland** recorded the largest % increase for kerbside plastic bottle collections (7.6%)
- **Northern Ireland** reported significant increases in pot, tub and tray collections from kerbside and bring schemes (16.5% and 23%)

Performance Rate - Average Collection Rates per Household per Year

- Plastic bottles - **11.82 kg**
- Pots, tubs and trays - **9.82 kg**
- Plastic bottles and pots, tubs and trays - **21.64 kg**

Container & Frequency

- **Wheelbin** had the highest container participation rate with 91%
- Most common frequency for collections is **alternate weekly** (49%)
- **Weekly collections** had the highest average performance rate - 13.3 kg per household in 2012

New Consumption Data Gives Revised Household Plastics Packaging Recycling Rates

- **58%** Plastic bottles
- **19%** Pot, tubs and trays
- **37%** Rigid plastics packaging

Local Authority Household Collection Provision

- **391** Local Authorities offer a kerbside collection service that includes plastic bottles - **96%** of UK Local Authorities
- At the end of March 2013, **16** Local Authorities do not offer a kerbside service that collects plastic bottles
- **244** Local Authorities collect pots, tubs and trays - **60%** of local authorities
- **65** Local Authorities collect plastic film - **16%** of Local Authorities
- **4** new plastic bottle and **20** new pot, tub and tray collection schemes reported as being planned for 2013

Key Data

Sales, Markets & PRNs

- Average mixed plastic bottle price in 2012 - **£110.45 per tonne**
- Using the average £110.45 per tonne mixed bottle value, the un-recycled household bottles in 2012 have a potential average value of **£25m**
- Based on the median landfill gate fee for non-hazardous material of £85 per tonne, there would be **£19m** disposal costs for these bottles in 2012
- Actual costs for disposal of pots, tubs and trays is between **£44.9m** and **£55.5m**
- Recoup estimate the ultimate destination of **50%-70%** of plastics collected in 2012 is export, with **30%-50%** staying in the UK for reprocessing
- **60%** of plastic bottles collected for recycling are recycled in the UK
- **Chinese Green Fence Policy** continues to be strict on imports of unwashed plastics
- There is opinion that more **PRN** monies should be invested in collections
- Waste contractors control **89%** of the plastics sales and receive a share of up to **75%** on average from the revenue of the sales

Waste & Recycling Legislation

- **Waste Management Plan for England (2013)** has a broad aim to ensure a path is set "towards a zero waste economy" - consultation closed in September 2013
- **Wales' Supporting Waste Prevention Programme** focusses on behaviour change for waste prevention - consultation closed June 2013 prevention
- Scotland launched a **Business Resource Efficiency Service** in April 2013
- Northern Ireland's **Towards Resource Efficiency** set to introduce statutory recycling targets for local authorities - consultation closed in September 2013

UK Targets

- **640,613** tonnes of plastics packaging recycled in 2012 (from household and C&I sectors)
- Estimated **1,213,000** tonnes of plastics packaging to be recycled by 2017 to meet UK targets
- If the household and C&I split was applied to 2017 there would be **836,970** tonnes of plastics packaging being collected from UK households - a **90% increase** from the 440,401 tonnes collected for recycling in 2012

Alternative Technologies

- **11%** of Local Authorities stated the pots, tubs and trays they collect for recycling go to **alternative end destinations e.g. EfW**
- **32%** of Local Authorities stated their plastics placed in residual bins are recovered to go to **residual pre-treatment** operations or alternative end destinations rather than landfill

Communications

- **61%** of Local Authorities are planning or considering some form of **communications campaign** before March 2014
- When asked what tools would be **most useful tools** to support plastics recycling communications the priorities were **funding (26%), promotional items (21%) and information/statistics (19%)**

Introduction

This is the 19th Recoup UK Household Plastics Collection Survey, a report which provides an in-depth review of the services in place for the collection of household plastics for recycling in the UK.

Recoup has been responsible for the collection of data and publishing of the UK Household Plastics Collection Survey since 1994.

With information from all Local Authorities, it is the most complete source of information about household plastics collection in the UK. Providing an in-depth review of the infrastructure in place, it informs stakeholders on the core raw data and information such as current plastics packaging collection levels, recycling rates, collection methods and practices, potential future collection rates and the barriers and opportunities for plastics recycling in the UK.

Recoup would like to thank all the Local Authority recycling scheme managers and their service contractors who took the time to respond to our requests and have made this work so comprehensive and worthwhile. We continue to ensure that Local Authorities are represented and have a voice within Recoup through membership, and the Local Authority Recycling Advisory Committee (LARAC) representation on the Recoup board. We have also taken the opportunity in the past year to provide a detailed response to the Local Government Association (LGA) waste review call for evidence, and have also held exploratory discussions with the National Association of Waste Disposal Officers (NAWDO).

In addition to this core information, the 2013 Survey will also cover detailed explanation of the new plastics packaging consumption data and collection rates, plastics communications, views and opinions about PRN's (Plastic Recovery Notes) in the *Sales and Markets* section, alternative technologies such as Energy from Waste (EfW), Mechanical Biological Treatment (MBT) and Refuse Derived Fuel (RDF), and progress against the UK's plastics packaging recycling targets.

"I am pleased to say that after 14 years as patron of Recoup, the organisation continues to play a critical role in the development of UK plastic recycling.

Recoup are entering a new era, and facing challenges which are comparable with those some 23 years ago when originally formed. With strong support from the entire plastic supply and recycling chain, we are confident that we can address and overcome these challenges."

Professor David Bellamy OBE
Recoup Patron and Environmental Campaigner

Introduction

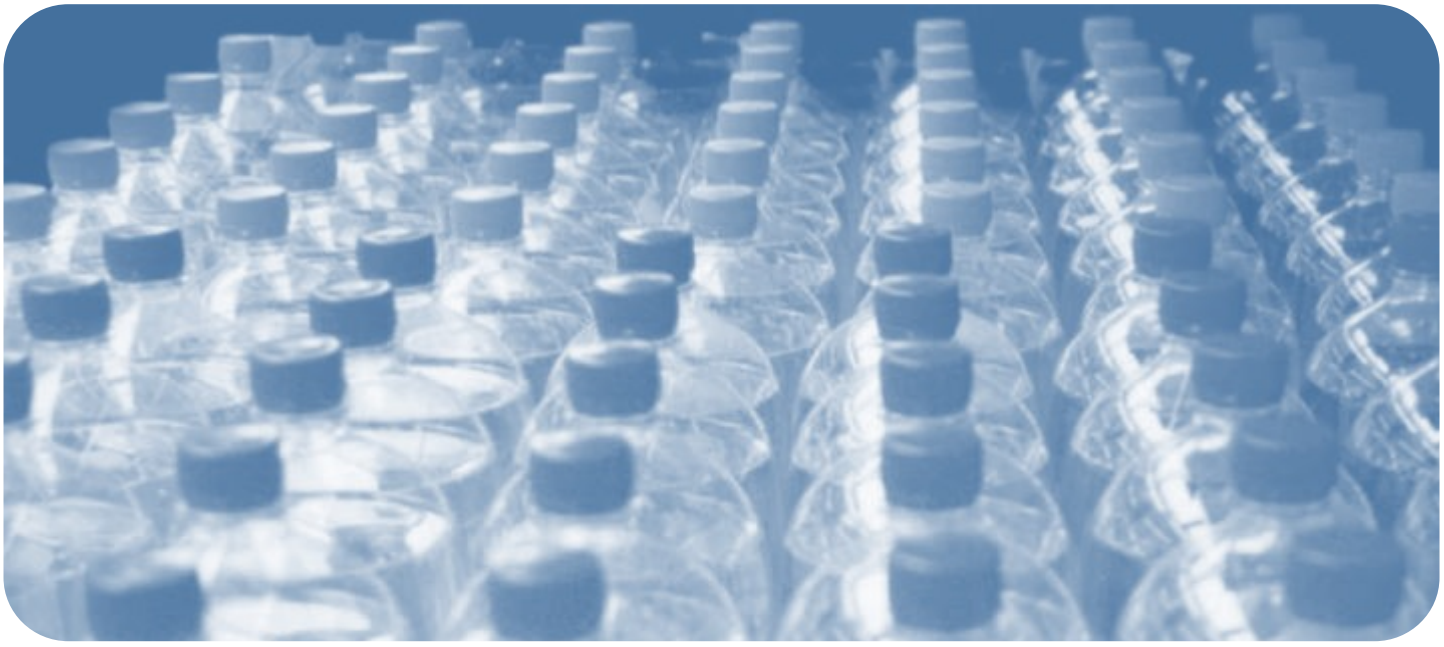
Recoup distributed our online UK Household Plastics Collection Survey to all waste collection, unitary and disposal authorities in the UK, whether it be Borough, District or City Councils, County Councils or Waste Partnerships. The data and information collected was based on 2012 calendar or 2012/13 financial year which was provided by the majority of UK local authorities.

The reaction to the Survey was once again very positive, and received a very high level of responses, not only in terms of questions around raw data regarding the service provision, but also comment and opinion for all aspects of plastics collections.

The UK are now in the first year of the Governments plastics packaging recycling targets for 2013-2017, and with the UK needing to recycle nearly double the plastics packaging collected for recycling by 2017, this dialogue is essential.

This can then feed into the work done by Recoup and its members, and can have an important role across the plastics supply and recycling chain, with the key element being to assist the process of infrastructure development by providing support in the right areas. This could be from helping with sensible policy and strategic development, to developing practical initiatives such as a National Plastics Communications Initiative.

The Survey continues to provide an essential reference and guidance for stakeholders involved in local and national government waste management, and also those in industry who have responsibilities or interests in developing sustainable plastics recycling. With data that is used across the plastics supply and recycling industries, it provides a performance gauge for plastics household recycling, how current barriers to recycling can be resolved, and how household plastics recycling can contribute to the UK long-term environmental and legislative aims.



Methodology

The methodology and terminology used in the Survey are explained in order develop an understanding of how data is calculated and explain some of the acronyms that have been used.

Methodology

The Recoup project team spend a significant amount of time reviewing, following up, checking and calculating the submitted data and information to ensure the final report is as accurate as possible.

Data Analysis

Producing a comprehensive plastics collection tonnage dataset is not simply about adding up reported tonnages in that many have to be calculated based on available data.

There are many variables here. A developing issue for Local Authorities when reporting accurate collection tonnage is that the authorities are increasingly collecting commingled materials from their kerbside or bring schemes, and that bring sites are serviced as part of their kerbside collection route. This means the total provided might not only be for plastics, but also for a combination for all other non-plastic dry recyclables collected such as cans, glass, paper and cardboard.

Even if an overall total of plastics collected can be provided by an authority, in many cases it is not broken down by collection scheme (kerbside and bring) or plastic format (plastic bottles / pots, tubs and trays / plastic film). Clarification might also need to be sought on the different interpretations of 'mixed plastics packaging' to identify whether this means plastic bottles, pots, tubs and trays and /or plastic film. With a number of Local Authorities claiming to collect 'all plastics packaging', it was found that, in many cases, this meant only rigid plastics packaging and not plastic film.

These variables were particularly relevant for this year's Survey, where 108 Local Authorities provided collection tonnage that needed to be clarified or calculated based on the variables mentioned above.

In addition to collection tonnages reported, where no data or partial data existed and it was not known what services the Local Authority offered, an estimated dataset was completed based on finding out what services the authority provided and applying reasonable assumptions and average performance data. The basis for this was checking every Local Authority website to see what service they offered and what was collected. If there was any conflicting information on the website about the services being offered against what was reported in the Survey, the Local Authority was called to ensure the information documented was accurate.

Reasonable assumptions often meant calculating collection tonnage by using the number of households in that authority against the average that can be expected to be collected for these households (kg per household per year), and also using previous years' responses.

These approaches have been used where necessary to establish what services were provided by Local Authorities, calculating the overall tonnage collected, average collections per household per year (kg per household per year) and the number of bring sites. All other data and analysis in the Survey were based on actual responses only.

Methodology

Household Plastic Film and Non-Packaging Plastic

It should be noted that the total tonnage collected in 2012 does not factor in plastic film and non-packaging plastics. Despite efforts to gain more information about the collection volumes of these plastic formats, and indeed with some Local Authorities providing precise collection tonnage, the total collection levels are still very much an unknown quantity at present. However, looking at what is known about the collection provision provided across the UK, Recoup believe even if this data was available it is not expected that it would impact significantly on the total tonnage collected.

Non-Household Plastics

The Survey does not include plastics from non-household sectors such as commercial and industrial, construction and demolition and agriculture. Although Local Authorities do offer commercial and industrial plastics collection schemes to varying levels and this is increasingly a valid piece of work, this type of survey could only be produced by Recoup if separate sponsorship was made available.

It is also inevitable that some non-household plastics will enter household recycling systems, particularly 'household like' plastics, for example, when consumed in the workplace or on the go. It is not possible to account for this within this report, although consumer behaviour research could provide some additional insight in this area.

Terminology

The terminology that has been defined using acronyms are described below. Other acronyms have been used and an explanation of these have been provided at the relevant point in the report.

The main types of plastics packaging present in the recyclables fraction can be separated into plastic bottles and non-bottle rigid household plastics packaging. The term recommended by Recoup, as always, will be used, which is pots, tubs and trays.

In terms of collection schemes, there are two schemes used – kerbside and bring. Kerbside schemes are where recyclables are collected directly from householders' doorsteps. Bring schemes are where containers are placed in central public locations such as supermarket sites and car parks, where the public could place their recyclables into.

Two of the non-household sectors, Commercial and Industrial, and Construction and Demolition, are referred to as C&I and C&D respectively.

Other terminology used refers to alternative recovery technologies such as Energy from Waste (EfW), Mechanical Biological Treatment (MBT) and Refuse Derived Fuel (RDF). When considering the UK plastics compliance scheme, PRN's (Plastic Recovery Note) and PERNs (Plastic Export Recovery Notes) have been used.

Methodology

WasteDataFlow

WasteDataFlow - Local Authority Recycling Performance Data vs Plastics Recycling Levels

WasteDataFlow *(www.wastedataflow.org/home.aspx)* is the database for UK Local Authorities to report municipal waste data to the government, and was set up with the aim of gradually replacing the number of waste questionnaires issued to local authorities by government, departments, agencies, institutions and organisations about their waste and recycling performance, with only one dataset that they would need to complete. However, the same issues Local Authorities have in reporting tonnages for dry recyclables in this Survey also exist in completing WasteDataFlow. The issue could be that they do not have the necessary resources in place to investigate, obtain or calculate the data, or it might be that the processes are not in place and it is just not possible to report the data. An example was when investigating WasteDataFlow plastics tonnages for the 2012 Survey, it was found 52 Local Authorities did not submit tonnages. WasteDataFlow stated this was due to a change in the councils' status, and these type of changes are often continuous in local government.

There are also often no obvious links between plastics collections and Local Authority recycling rates reported by WasteDataFlow. Again, this can be due to that the data reported for WasteDataFlow is for all dry recyclables, and there is limited or no plastic specific data available.

Recoup always strive to use the most accurate reported collection tonnages, and using the methodology described in this section we are confident that we provide the best dataset to monitor household plastics packaging collections, and will continue to review all available sources, including WasteDataFlow.

The Story So Far

Household plastics recycling tonnages and rates have been reported by Recoup's UK Plastics Collection Survey since the first year it was published in 1994, and as a result the impressive progress and story of plastics recycling from UK's households can be tracked throughout this time.

Plastic Bottle Bring Schemes

In 1994, the first year the survey was published, there were just 425 tonnes of plastics collected. These were from bring schemes, which were containers placed in central public locations such as supermarket sites and car parks, where the public could place their plastics bottles into. At this time only plastic bottles were collected as they were, and still are, the easiest plastics packaging to recycle - they comprise of fewer polymers and are generally more homogenous with fewer barrier layers (and the differing properties these contain) than pots, tubs and trays and plastic film.

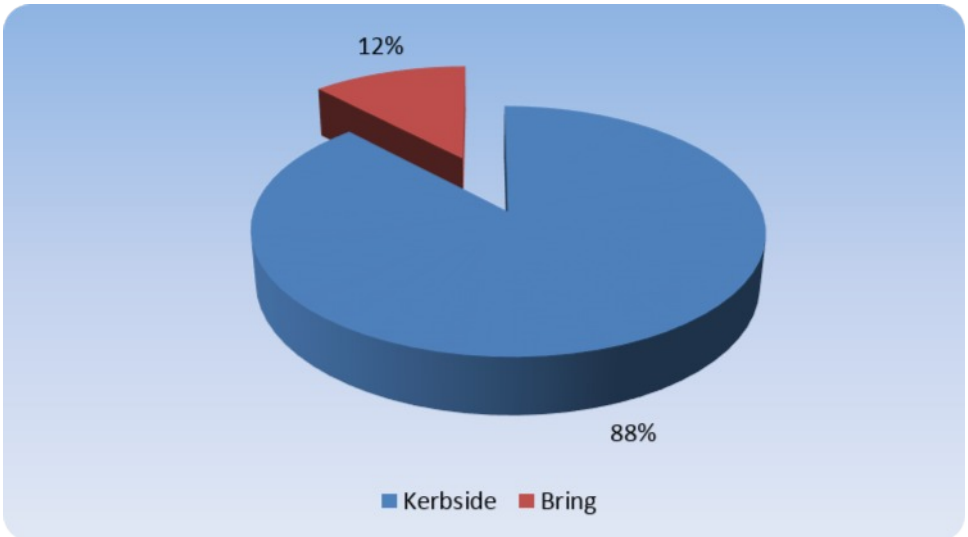
After the success of these early schemes, collections grew steadily as local authorities became more aware of the benefits of recycling plastic bottles, markets for the recycled plastic bottles developed, better handling and sorting infrastructure was installed, and the public more familiar with the concept of recycling in general.

Kerbside Schemes

Collections continued to grow until 2002, at which point 17,000 tonnes of plastic bottles were collected for recycling. It was after this the significant increases really began and the landscape of household plastics packaging collection rates began to change. This was when collecting commingled dry recyclables from households became more common, where recyclables were collected directly from householders' doorsteps and enabling them to recycle their plastic bottles more easily without the need to travel to a public recycling point. This scheme is known as kerbside collection.

In 2003 it was established that the 24,304 tonnes of plastic bottles collected consisted of 18,336 tonnes from kerbside schemes and 5,968 tonnes from bring schemes – over 3 times more from kerbside schemes – and there has been a significant growth in the use of kerbside collection systems ever since. The latest kerbside to bring collection split data is shown in Figure 1, with collections from kerbside schemes collecting over 7 times more plastics packaging than bring schemes.

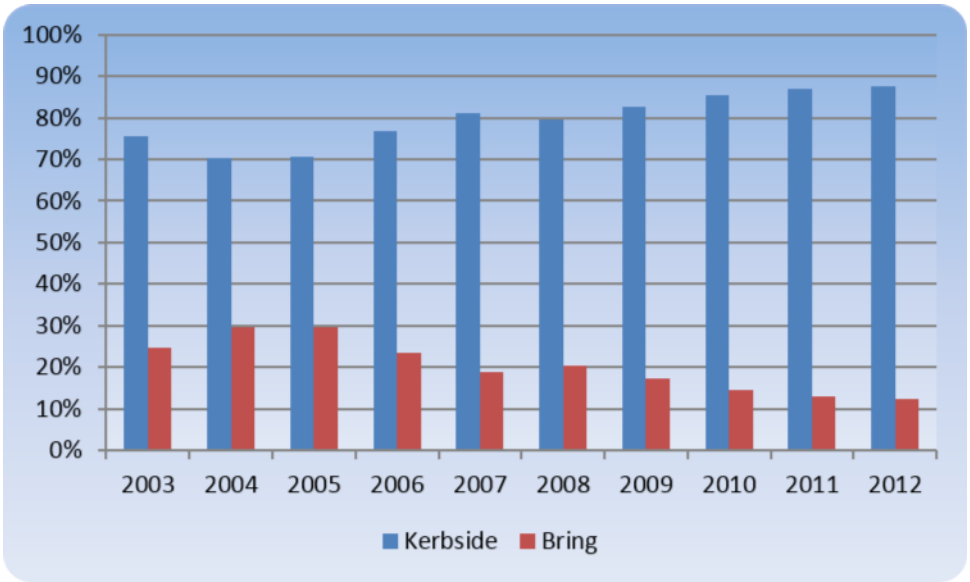
Figure 1 - Comparison of Household Plastics Packaging Collected by Scheme by Local Authority



The Story So Far

Figure 2 shows the percentage split of how many plastic bottles are being collected through kerbside and bring schemes since data from kerbside schemes was introduced, and this includes the latest collection data. It clearly demonstrates that the majority of the plastics collected for recycling are from kerbside schemes, with bring schemes generally used by local authorities alongside kerbside schemes to form part of their overall recyclables collection provision.

Figure 2 - Percentage of Household Plastics Packaging Collected through Kerbside and Bring Schemes



Since 2003, a number of variations in kerbside schemes have occurred (for example, the collection container, service frequency, and communications), and these are explored at various points later in this report.

Pot, Tub and Tray Collections

Another major development occurred around the mid-2000's, when non-bottle rigid plastics packaging started to be collected in significant quantities. It should be noted that some Local Authorities started collecting this material long before this, and one of the earliest collection schemes was in Exeter, who were collecting this material in the 1990's.

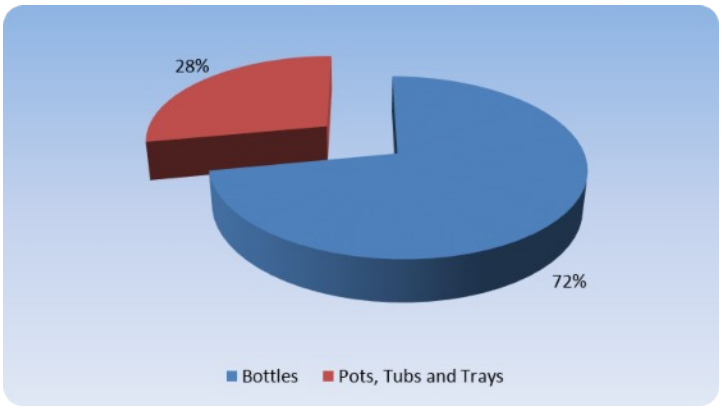
Now commonly referred to by Recoup as pots, tubs and trays, with new collection schemes being introduced and development and expansion of existing schemes, there has been a meteoric increase of pot, tub and tray collections since the first time they were reported on in the 2007 Survey. There was 10,856 tonnes reported as being collected in 2007, and the latest data from 2012 reported 124,347 tonnes being collected. The largest increases have been seen from 2009, at which point 40,363 tonnes were collected – this is an overall increase of 208% in just 3 years.

The Story So Far

Summary of Collections Since 1994

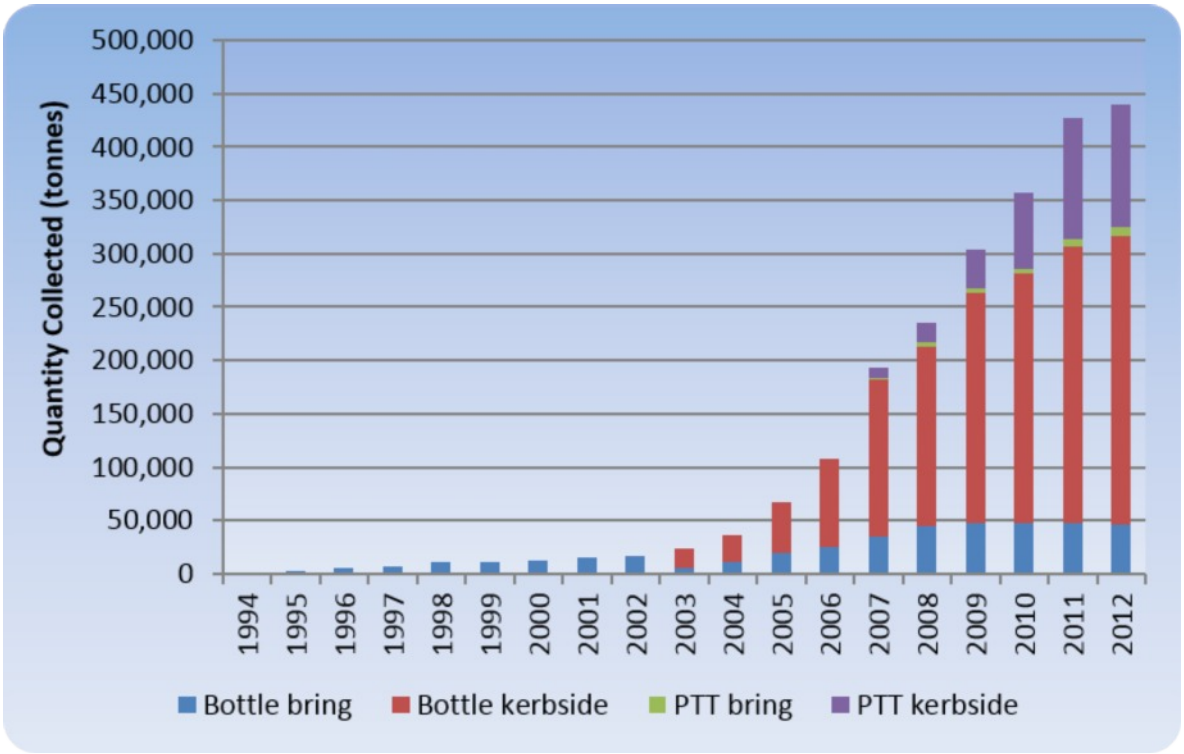
Collections of plastics in 2012 consist of plastic bottles, pots, tubs and trays, and also plastic film and non-packaging plastics. However, despite efforts to gain more information about the collection volumes for plastic film and non-packaging plastics, Recoup believe there is not sufficient collection data to provide an accurate overall total for what is collected across the UK. Therefore, the current collection data is split between plastic bottles and pots, tubs and trays, and the breakdown of the total plastics packaging collected is shown in Figure 3.

Figure 3 - Composition of Household Plastics Packaging Collected



To summarise these developments, the growth from 1994 to the current collection volumes reported for this year's Survey in 2012 is shown in Figure 4.

Figure 4 - Growth in Household Plastics Packaging Collections



The Story So Far

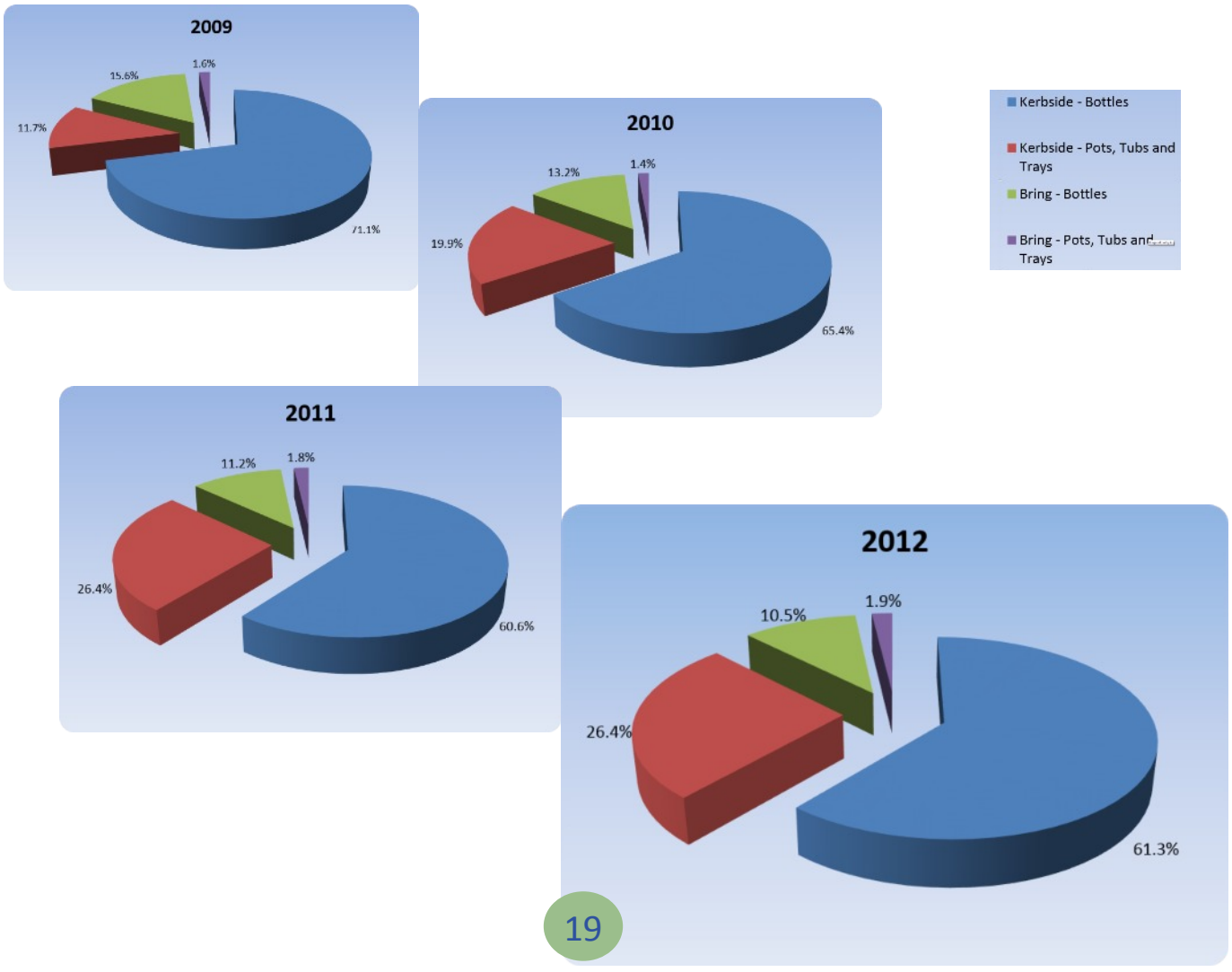
This growth until 2012 has been rapid and significant, particularly from 2005 onwards. Certainly, hypothetically speaking, when looking at the growth of plastics packaging collections in Figure 4, if the years on the x-axis were removed from 2003-2012, and in 2003 the collection data was not presented as actual collection tonnage but as targets for a 10 year plan to increase plastics packaging recycling, it would be difficult to see how the collection volumes would be met.

The increases shown have only been possible with the infrastructure developments for all dry recyclables, including plastics. It is not just the increased collection coverage across the UK and the contracts that implement them, but building and developing facilities to effectively sort collected materials, and also for the increasing demand and commercial appetite that drives the established end markets for post-consumer plastic bottles.

Looking more closely at developments in recent years the percentage breakdown of the total tonnage collected by scheme and plastic format over the past 4 years is shown in Figure 5. This provides a good indication of trends, and illustrates both the increased role of kerbside as the key scheme for collecting household plastics packaging and the increasing proportion of pots, tubs and trays.

It is clear increasing collection levels in the the future will be from better utilisation of existing kerbside schemes. However, with collections from bring schemes still offering a low overall cost option to collect material and being the only viable option to collect non-packaging plastics , it is expected that collection volumes from bring schemes will remain stable and continue to play an important role in Local Authority plastics collection provision.

Figure 5 - Percentage of Household Plastics Packaging Collected by Scheme Type



Collection Rates

New UK Plastics Packaging Consumption Data

As with every Recoup Survey, to calculate the percentage recycling rates the plastics packaging collection data is combined with best available packaging trends and consumption data .

In January 2013, Valpak and WRAP produced a suite of reports around plastics packaging consumption (the flow onto the market), long-term recycling and carbon footprint projections. These were:

- Plastics Packaging Composition 2011 – to provide the composition of the plastics packaging consumed by packaging format and polymer type
- Plasflow 2017 – to map the flow of plastics packaging from consumption (using *plastics packaging Composition 2011*) through to end markets in order to develop compliance scenarios for meeting the 2017 plastics packaging recycling target
- Plasflow Carbon – to assess the carbon footprint scenarios to meet the 2017 plastics packaging target (using the data and models outlined in *PlasFlow 2017*)

These provide strong new evidence and methodologies to calculate plastics packaging consumption and thus recycling rates. Recoup contributed data and information for these reports, and after contributing to the evidence base and working with Valpak, we can accept that the data is the most robust currently available. Therefore it was decided this is the best available consumption data available and will be used in this report to calculate the updated recycling rates.

2011 Plastics Packaging Consumption Data

Until the 2012 Survey the plastics packaging consumption data was based on a detailed review that took place in *UK Plastics Waste – A Review of Supplies for Recycling, Global Market Demand, Future Trends and Associated Risks*, a report produced by WRAP, GHK and Recoup in 2006. It indicated that 548,000 tonnes of plastic bottles were consumed in 2005, with 523,000 tonnes entering the household waste and recycling systems and up to 25,000 tonnes were consumed outside of the home from 'on the go' recycling schemes. Ever since, the Survey has assumed a 2% annual growth rate for plastic bottles since 2005, which also factors in pack light-weighting activities that have taken place over this period. Using this data the estimated UK consumption rate for plastic bottles in 2011 was 617,100 tonnes, consisting of 592,100 tonnes entering the household waste and recycling systems, and 25,000 tonnes from outside the home.

The consumption rate for pots, tubs and trays has been based on best available data, and there was a greater degree of uncertainty compared to plastic bottle consumption. For the 2011 Survey it was inferred from various stakeholders and plastic supply chain groups that 500,000-600,000 tonnes was a reasonable estimate entering the household waste and recycling systems, and it was believed the higher end of this range was appropriate and therefore 600,000 tonnes was used.

Therefore, combining the 592,100 tonnes of plastic bottles and 600,000 tonnes of pots, tubs and trays produced an estimated 1,192,100 tonnes of plastics packaging entering the UK household waste and recycling systems in 2011.

Collection Rates

New Plastics Packaging Consumption Data

The original source of the quantities of UK plastics packaging consumed and whether it was from household or non-household sources were estimated using another Valpak report, *PackFlow 2017*. This was published in 2012 to provide knowledge of the flow of packaging materials in the UK both past, present and the future (to 2017). This provided the consumption data using ranges, and for the purposes of calculating total consumption and consequently recycling rates, midpoints of these ranges have been used, and these are shown in Figure 6.

Figure 6 - UK Plastics Packaging Consumption

Source	Split	Total
Consumer (Household)	57%	1,445,000
Consumer (Away from Home)	11%	279,000
Consumer (Total)	68%	1,724,000
Non-Consumer	32%	811,000
Total	**100%**	**2,535,000**

When calculating the new consumption rates for each plastic format, the focus is on the data in P*lastics Packaging Composition 2011*, which takes the consumption data from *PackFlow 2017*. The research in this report covered both consumer (household) and non-consumer (non-household sectors, mainly consisting of C&I) packaging, and is a totally new way of estimating plastics packaging consumption in UK households. This new methodology estimates the composition of consumer plastics packaging by sampling supermarket packaging using the packaging weight, format and polymer data which was provided by supermarkets' suppliers and from product sales data.

The household and non-household totals were then broken down by plastic formats (rigid and film) and also by polymer. As this report focusses on plastics packaging flowing through UK households, the breakdown of the 1,724,000 tonnes is shown in Figure 7. However, this data though cannot be used in its original form. Certain key parts need to be extracted to calculate the recycling rates for plastic bottles and pots, tubs and trays, and these are highlighted in the red cells.

Figure 7 - UK Plastics Packaging Consumer Packaging by Format and Polymer Type (2011)

	LDPE / LLDPE	HDPE	OPP	PP	PET	PS	PVC	Other	Grand Total	Grand Total (%)
Film Total	**145**	**140**	**16**	**93**	**59**	**1**	**6**	**95**	**556**	**32%**
Rigids Total	**10**	**193**	**4**	**150**	**688**	**66**	**42**	**15**	**1167**	**68%**
Bottles	1	158	0	4	333	0	2	0	498	29%
Consumer Closures	3	32	3	17	21	0	1	3	80	5%
Consumer PTTs	5	0	0	123	329	53	39	7	556	32%
Other	1	2	0	5	6	13	0	5	33	2%
Grand Total	**156**	**333**	**20**	**243**	**747**	**68**	**48**	**110**	**1724**	**100%**

Collection Rates

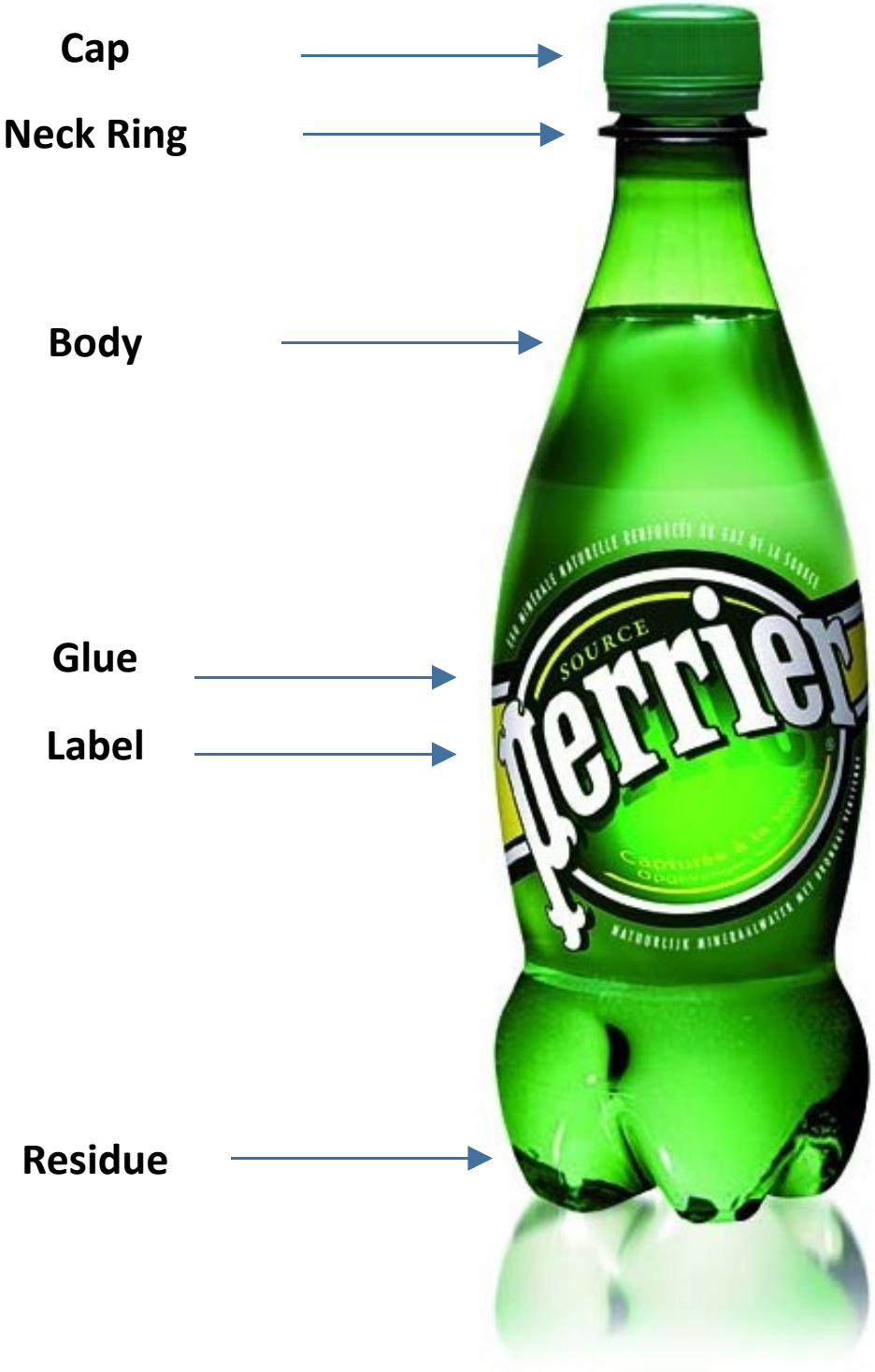
How the New Plastics Packaging Consumption Data is Calculated

It can clearly be seen that the 498kt are plastic bottles, and the 556kt is for pots, tubs and trays. However, it is not so clear where the tonnage for 'Consumer Closures' and 'Other' plastics packaging should be allocated. The 80kt of closures refer to rigid consumer closures for plastic bottles and pots, tubs and trays. The 'Other' category is for the other plastic formats that are not covered by the plastic bottle, pot, tub and tray and closure categories, and this includes items such as tubes, valves and pads.

With the 80kt closures being split between plastic bottles and pots, tubs and trays, the evidence provided by Valpak is that 36% of this being plastic bottle caps, which is 29kt. The remaining 51kt are rigid closures for pots, tubs and trays. The reported tonnage for closures has actually doubled since 2005, which according to one of the sponsors for this Survey and Recoup member, RPC Containers, was an accurate reflection of the market.

The 'Other' category is a relatively small tonnage amount of 33kt, and with the majority of this tonnage being attributed to non-bottle rigid plastic rigid plastics packaging, all of this tonnage has been added to the pot, tub and tray consumption tonnage.

In addition to this, plastic labels have not been accounted for in the rigid fraction in Figure 7, as they are made of film. An informed Recoup estimate of 4kt has been made, which is taken from the 556kt film fraction.



Collection Rates

Residue

It should be noted that the new consumption data doesn't include any tonnage for residue i.e. fluid or food left in the packaging, and wasn't included in the Valpak data as the focus was on the actual plastics packaging. However, it a reasonable argument that residue may actually be reported in the total volume of plastics packaging that is collected for recycling. This, in effect, means that if all plastic bottles were collected for recycling, the actual weight collected would exceed the total weight of the plastics packaging put onto the market and the recycling rate would be over 100%!

This is an issue that is not heavily reported as it affects the PRN (Plastic Recovery Note) and PERN (Plastic Export Recovery Note) value of the collected plastics. If a tonne of plastics packaging is recycled in the UK, the point at which the PRN is issued is at the melt point i.e. the process of being converted into a new raw material (e.g. a pellet). If the plastics are going to be exported to be recycled, the PERN is issued at the point of export i.e. before the melt point. This means that if the plastics are recycled on the domestic market the residue would have been removed through either piercing the bottles at a MRF to remove any excess fluid and / or washing the bottle or the pot, tub or tray, and the weight of the residue would not be counted towards the value of the material. If the plastics are exported, there is a possibility that the fluid has not been removed and the pack not washed, and the weight of the residue is actually counted towards the weight and thus value of the material.

This clearly incentivises the export market, and with the Chinese Green Fence policy on unwashed plastics that are arriving on its shores now taking a firm hold, there needs to be a far greater understanding about how much of the plastics packaging is actually fluid or food residue and how it impacts the weight of the plastics packaging that is exported. With an estimated 50% of the plastics packaging collected for recycling in the UK exported in 2012, this is an important consideration.

Plastics Packaging Consumption Trends

Plastics packaging consumption trends are estimates, with between 0% and 3% per annum growth frequently being debated. Recoup has assumed a 2% annual growth rate for plastic bottles since 2005, and the approach from Recoup and Valpak is there should be a 2% increase for plastic bottles in 2012, thus increasing consumption data provided in P*lastics Packaging Composition 2011* and *Plasflow 2017* by 2%. It has also been estimated that this 2% increase is also applicable for pots, tubs and trays.

Collection Rates

Plastic Bottles

The calculation to show the plastic bottle consumption rate is shown below:

Plastic Bottle Consumption Calculation

Body – 498kt
Closures (cap and neck ring) – 29kt (36% of 80kt)
Labels – 4kt (from the 556kt film fraction)
Residue – none
Total = 531kt
Plus 2% annual increase = **541,620**

There is no weight attributed for any adhesive used, although this would be so small it is not expected to have any impact on the overall weight.

Pots, Tubs and Trays

The calculation to show the pot, tub and tray consumption rate is shown below:

Pot, Tub and Tray Consumption Calculation

Body – 556kt
Closures (rigid lids and closures) – 51kt (80kt minus 29kt attributed for plastic bottles)
Other – 33kt (including 15kt of film)
Residue – none
Total = 640kt
Plus 2% annual increase = **652,800**

In *Plasflow 2017* the term 'consumer mixed plastics' was used to represent non-bottle rigid plastics packaging and film. Therefore, from the data highlighted in Figure 7, the 556kt includes the main body of the pack and also any attached film. All tonnage for rigid lids and closures are included in the 51kt closures, and all the 33kt in the 'Other' category being attributed to pots, tubs and trays.

Collection Rates

2012 Household Plastics Collection Tonnages and Recycling Rates

Recoup can confirm that the total plastics packaging collected from households in the UK in 2012 is 440,401 tonnes. This total comprised of:

- 316,054 tonnes of plastic bottles
- 124,347 tonnes of pots, tubs and trays

The breakdown by collection scheme and plastic format is shown in Figure 8.

Figure 8 - Breakdown of Household Plastics Packaging by Scheme and Packaging Type

2012	Plastic Bottles (Tonnes)	Pots, Tubs and Trays (Tonnes)	TOTAL (Tonnes)
Kerbside Schemes	269,790	116,071	385,861
Bring Schemes	46,264	8,276	54,540
TOTAL	**316,054**	**124,347**	**440,401**

This is an overall increase of 13,810 tonnes, and confirms an increase of 9,795 tonnes of plastic bottles and 4,015 tonnes of pots, tubs and trays, and an overall increase of 3% for both.

These collection rates are lower than the predictions made in the 2012 Survey, based on reported planned scheme developments and inferred additional growth estimated 478,032 tonnes of plastics packaging were to be collected in 2012. However, this also allowed for historic under reporting of collection developments by 10%, and if this was not included the estimate would have been 434,574 tonnes, which is only 5,827 tonnes under the actual reported total of 440,401 tonnes. This indicates that 1% under reporting was accurate and not 10%.

Projections from planned scheme developments aside, the actual collection increase for plastic bottles was expected, but considering the rapid increases of pot, tub and tray collections in recent years the actual reported data for this plastic format was far less than anticipated. The lower than expected collection tonnages are explored more below.

Collection Rates

Lower than Expected Collection Tonnages - More Refined Data

The lower than expected collection tonnage for pots, tubs and trays could be due to far more refined data being collected this year. This is covered in the *Methodology* section (on page 13).

For each year's Survey, the Recoup team spend a significant amount of time reviewing, following up, checking and calculating the submitted data and information to ensure the final report is as accurate as possible, and this is particularly needed when calculating collection tonnages.

Due to operational pressures and time restraints, it is often not easy or even possible for Local Authorities to provide plastics collection tonnage, and particularly broken down in the detail that is required for this report – the key point is that there are many variables that can affect the reported tonnage from Local Authorities. This could be that the reported tonnage is not being broken down by collection scheme (kerbside and bring) or plastic format (bottles, pots, tubs and trays and film) and what are the definitions of 'mixed plastics packaging'. The reported tonnage could also refer to other non-plastic dry recyclables such as aluminium and steel cans, paper and cardboard, and glass which is in the plastics fraction as a contaminant when the weights are taken.

Despite of this, in previous Surveys there are many Local Authorities that inform Recoup that the accuracy of the reported tonnage are affected by these variables. However, for the 2013 Survey there were comments about the collection tonnages reported from 108 local authorities stating that the reported tonnage needed to be clarified or calculated based on the any one or many of these variables – significantly more than any other year.

Recoup would like to thank the Local Authorities for their efforts to inform us of the best possible data they have available.

Plastic Film and Non-Packaging Plastics

The total plastics packaging tonnage collected in 2012 does not factor in plastic film and non-packaging plastics. Increased efforts were made in the 2013 Survey to gain more information about the collection volumes of these plastic formats, and indeed some local authorities reported precise collection tonnage. However, Recoup believe the total collection levels reported were not enough to provide an accurate overall total for what is collected across the UK. The reported totals being:

- 6,821 tonnes of plastic film
- 9,889 tonnes of non-packaging plastics

Collection Rates

What effect does the New Plastics Packaging Consumption Data have on the Recycling Rates?

If the plastics packaging consumption data that was used in 2011 was used again for 2012 with the annual 2% increase, despite the increased collection tonnages the recycling rates would have remained similar:

- With the 2% increase attributed to the plastic bottle consumption of 592,100 tonnes in 2011, the consumption for 2012 would have been 603,942 tonnes - this means that the 2012 collection tonnage for plastic bottles of 316,054 tonnes would not have changed the recycling rate from 2011 to 2012 (both 52%)
- With an estimated 2% increase from the inferred 600,000 consumption of pots, tubs and trays for 2011, the consumption would have been 612,000 - again, this meant that the 2012 pot, tub and tray collection tonnage of 124,347 tonnes would have given the same recycling rate for 2011 as it would for 2012 (both 20%)

New Recycling Rates

Clearly, revised plastics packaging consumption tonnage data is going to have an effect on the recycling rates, and the impact of this new data and the new collection tonnage is shown below in the updated recycling rates for 2012. This is the dataset that will be officially referenced by Recoup for 2012.

Plastic Bottles

With plastic bottle consumption tonnage reduced from 603,942 tonnes to 541,620 tonnes, a 62,322 tonne (10%) reduction, and an increase of 9,795 tonnes (3%) of plastic bottles collected for recycling, Recoup can confirm the UK household plastic bottle recycling rate for 2012 is **58%.**

Pots, Tubs and Trays

Pot, tub and tray consumption tonnage increased from the inferred 600,000 tonnes to 652,800 tonnes, a 52,800 tonne (10%) increase. With an increase of 4,015 tonnes (3%) of pots, tubs and trays collected for recycling, Recoup can confirm the UK household pot, tubs and tray recycling rate for 2012 is **19%**.

Total

The overall result is that a total household rigid plastics packaging consumption rate of 1,192,000 tonnes in 2011 has increased by 2,240 tonnes (0.2%) to 1,194,420 in 2012. With a total of 440,401 tonnes of plastics packaging being collected, this represents an overall UK recycling household rigid plastics packaging recycling rate of **37%**.

Collection Rates

The UK In Summary

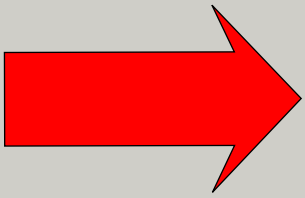
It is not a straightforward process to understand the developments in plastics packaging consumption data, the new collection tonnages and how this relates to recycling rates. A snapshot review of this data for 2011 and 2012 is therefore provided below:

2011 Consumption and Collection Data

Plastic Bottles
Consumption - 592,100 tonnes
Collected - 306,259
Recycling rate - **52%**

Pots, Tubs and Trays
Consumption - 600,000 tonnes
Collected - 120,332 tonnes
Recycling rate - **20%**

Total
Consumption - 1,192,000
Collected - 426,591
Recycling rate - **36%**



2012 Consumption and Collection Data

Plastic Bottles
Consumption - 541,620 tonnes
Collected - 316,054
Recycling rate - **58%**

Pots, Tubs and Trays
Consumption - 652,800 tonnes
Collected - 124,347 tonnes
Recycling rate - **19%**

Total
Consumption - 1,194,420
Collected - 440,401
Recycling rate - **37%**

The plastic bottle recycling rate passed the 50% barrier for the first time in 2011 with a rate of 52%, and if the caveats that have been explored are not explained or understood, the new 58% recycling rate appears to be a large increase.

The same explanations also need to be applied to pot, tub and tray collections, albeit in a different way – the recycling rate of 19% is 1% below the previous years' rate. In this instance it should be noted that collections for pots, tubs and trays are less established than for plastic bottles and the consumption and collection data has also been less accurate. For example, in 2010 the pot, tub and tray recycling rate was given a 12%-15% range, and the 2011 recycling rate was an inferred 20% i.e. the consumption data was estimated as being at the higher end of an estimated 500,00-600,000 range.

Recoup always strive to use the best available consumption data and most accurate reported collection tonnages to ensure that the recycling rates are as accurate as possible. The revised consumption data and a more refined collection dataset has undoubtedly caused a realignment of data, but importantly it produces a dataset that Recoup believe accurately reflects household plastics packaging collection in the UK.

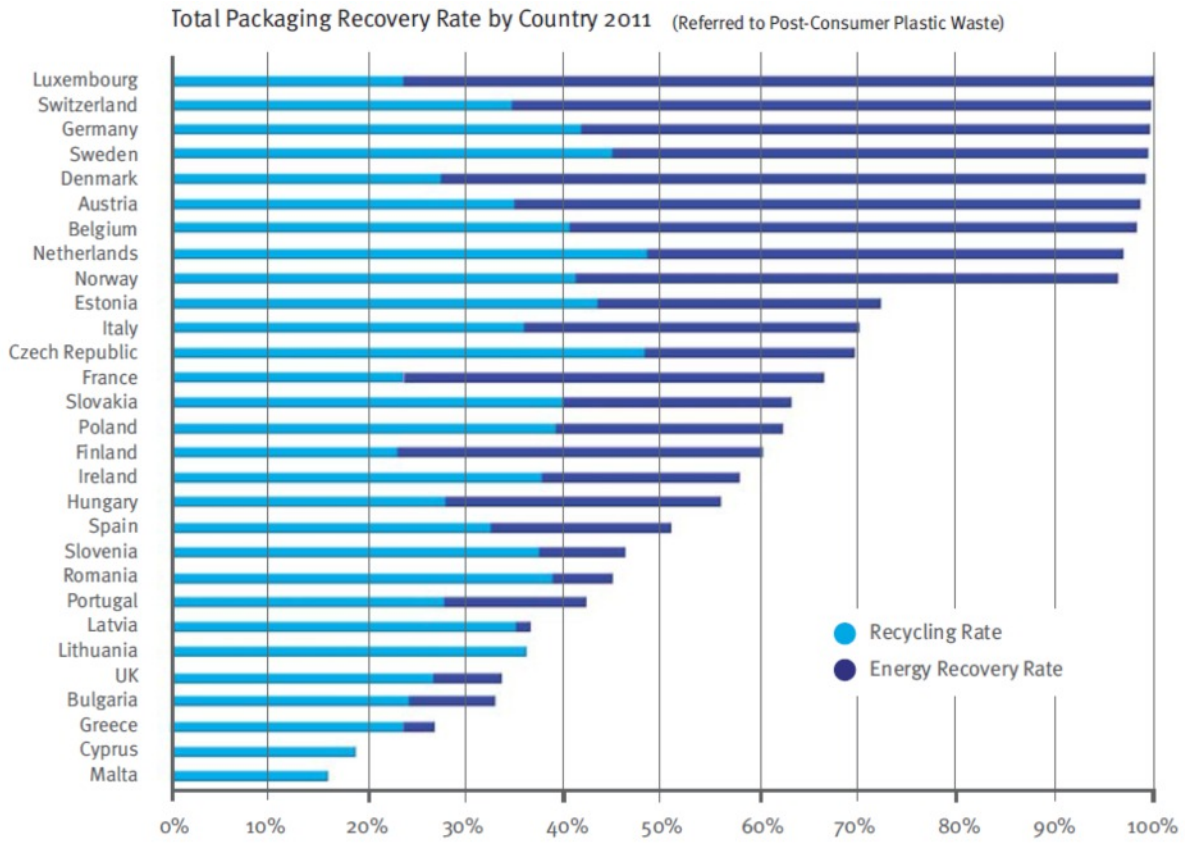
Collection Rates

European Union Plastics Packaging Recycling and Recovery Rates

The focus of this Survey is, of course, on the UK. However, EU Directives provide the legislative drivers in the development and implementation of policy and targets for the recycling industry across the UK, and there continues to be a strong growth trend in plastics packaging recycling and energy recovery in Europe. As such it is important to benchmark and identify how the UK recycling levels compare to plastics recycling and recovery levels in other EU countries.

The source for the recycling and energy recovery rates across Europe is *Plastics - the Facts*, produced by PlasticsEurope. The latest version is the 2012 edition which was based on 2011 data, and it is this data that was used in the previous Survey. However, it is still the most up-to-date source available for plastics packaging recycling and energy recovery across the EU, and it shown in Figure 9.

Figure 9 - Recycling and Energy Recovery Rate per Country in the EU (*Plastics – The Facts 2012*)



The 'recycling data' shown is mechanical recycling i.e. recycled materials used as raw materials in second life applications and products, and energy recovery, which refers to creating energy from a process of burning waste.

Historically, the UK were below average in EU plastics recycling and recovery rates until 2004, from which time significant growth has occurred. This was driven by the development of the kerbside collection infrastructure, initially for plastic bottles, and more recently by increasing collections of pots, tubs and trays.

The 2013 version of *Plastics - the Facts* is expected to be published soon after this report is issued.

Collection Rates

Based on plastics packaging tonnage recovered in Europe in 2011, combining both recycling and energy recovery, the UK were ranked 25th from 29 countries. This was down from 20th place in 2010. While the UK are recycling and recovering 32% of plastics packaging in 2012, there are nine countries achieving above 90% recovery – Switzerland, Germany, Austria, Sweden, Denmark, Belgium, Luxembourg, Netherlands and Norway. However, energy recovery technologies are used extensively by countries with the highest plastics landfill diversion rates (showing a wide range of between 0% and 77%), and the infrastructure for these technologies has only been implemented on a very limited scale in the UK.

Mechanical recycling performance across EU countries typically ranges from between 25% and 45%, and when considering the mechanical recycling rate in isolation the UK achieved a marginally better rank of 22nd from 29 countries – albeit this was down from 15th in 2010 and 17th in 2009. No EU country achieved a higher recycling rate than 48%, and Recoup question the methodology and consistency of data reporting from some countries compared to the UK, and believe the UK's actual position is much higher for mechanical recycling.

Whatever the UK's exact position, it is clear the UK needs to further develop its plastics recycling infrastructure and technologies to both meet ongoing targets and be seen as a leader in plastics waste and resource management, and with this in mind a review of the current and developing legislation both in the EU and in the UK are explored in the *Waste Strategies* section (on page 76).

Proposed Design for EfW Facility in Leeds

Infrastructure

Service Provision

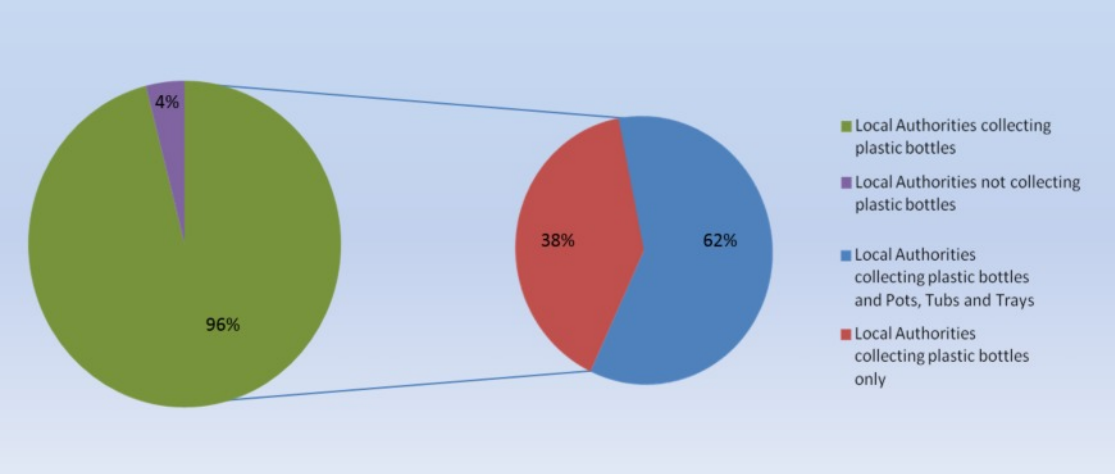
A comprehensive review was completed for the 2013 Survey to establish the service provision for kerbside plastics packaging collections across the UK. This was not only based on responses from the Survey questions, but checking every Local Authority website to see what they collected. If there was any conflicting information about the services being offered, the Local Authority was called to ensure the information documented was correct.

The information below refers to the overall Local Authority service provision for collections of plastics packaging from kerbside and bring schemes. More data and information for these collection schemes can be found in the *Kerbside Schemes* (page 39) and *Bring Schemes* sections (page 51).

Kerbside Schemes

It can be confirmed that a total of 391 of the 407 local authorities in the UK provide a kerbside scheme to collect plastic bottles, with 244 of those also collecting pots, tubs and trays. This means that 96% of Local Authorities now provide a kerbside collection scheme for plastic bottles, and 62% of these 391 local authorities also collect pots, tubs and trays (see Figure 10).

Figure 10 - Local Authorities Collection Provision



However, a relatively new development is starting to be adopted in that some Local Authorities report that they are now no longer collecting plastics as part of their recycling service, but are recovering it through their residual collection. The message to residents that their plastics are recycled through placing them in the residual waste bin. The Survey currently defines plastics collected for recycling as a separate dry recyclables collection and not part of the residual collection. This will need to be a consideration in the 2014 Survey when reporting service provision and the type of scheme used to collect plastics in the UK. Residual pre-treatment operations are explored in the *Alternative Waste Technologies* section on page 74.

Infrastructure

Number of Households Covered by Kerbside Plastics Collection Schemes

Trying to relate the kerbside collection schemes in place to the precise number of households that receive a particular service is difficult as not every household will receive a service from their local Authority. This might be due to the type of property it is (which is mainly due to flats and apartments), the location of the property (it might not be viable practically or financially to provide a service for households that are in remote locations), or the property might be empty for long-periods such as holiday lets or second homes. It also might be due to a collection scheme that is in a trial period and is gradually being rolled out to the households in that authority. This is particularly true for pot, tub and tray collections, where 41 new schemes were identified in 2012 and are currently being rolled out. Considering this level of detail, with operational pressures and time restraints, it is often not easy or even possible for Local Authorities to provide that type of information.

However, a broad assumption can be made using the number of households in the UK with at least one usual resident i.e. the household has regular kerbside collection. It can then be stated the maximum number of households that receive a kerbside collection that includes plastics i.e. the number of households receiving a kerbside collection can include any figure up to the total number of households. A household being defined as "one person living alone, or a group of people living at the same address who share cooking facilities and share a living room, sitting room or dining area" . The sources for the number of households are the *Office for National Statistics - 2011 Census: Population and household estimates for England and Wales* (Published 16th July 2012), *General Register Office for Scotland - Estimates and Dwellings in Scotland, 2012* (2nd revision: 10th July 2013) and *Northern Ireland Statistics & Research Agency - Census 2011, Population and Household Estimates by Local Government District for Northern Ireland* (September 2012).

Plastic Bottles

Assuming that 96% of Local Authorities provide a typical representation of the average number of households per Local Authority in the UK, if every household in these authorities was potentially able to make use of the kerbside service this means the plastic kerbside infrastructure in the UK covers up to 25,340,049 of the 26,439,375 households with at least one usual resident.

Pots, Tubs and Trays

With many collection schemes for pots, tubs and trays in the UK being rolled out it is more difficult to establish the number of households that receive a service. Therefore, with 60% of the Local Authorities in the UK providing a pot, tub and tray kerbside collection service, the methodology that was applied for plastic bottles can be used. Assuming the 60% of Local Authorities provides a typical representation of the average number of households per authority in the UK, once these schemes are fully established and if every household in these local authorities are able to place their pots, tubs and trays in the recyclables collection container, this means the plastic kerbside infrastructure in the UK covers up to 15,774,212 of the 26,439,375 households with at least one usual resident.

Infrastructure

Bring Schemes

It can be confirmed that 256 (63%) of the 407 collection authorities in the UK provide a bring scheme to collect plastic bottles. From the total of 256 local authorities, 169 (66%) collect plastic bottles only with 87 (34%) of those also collecting pots, tubs and trays.

Plastic Bottles

An overall summary of the infrastructure in the UK for England, Scotland, Wales and Northern Ireland to collect plastic bottles is shown in Figure 11. This includes the service provision by collection scheme (kerbside and bring), the estimated number of households that could receive a kerbside collection service, and also the number of bring sites.

Figure 11 - Breakdown of Collections of Plastic Bottles by Country and Scheme Type

Plastic Bottles				
Country	Kerbside Schemes		Bring Schemes	
	Number of Local Authorities	Number of Households	Number of Local Authorities	Number of Sites
England	314	21,186,262	212	5,725
Scotland	29	2,147,813	23	1,955
Wales	22	1,302,700	13	238
Northern Ireland	26	703,275	8	100
Total	**391**	**25,340,049**	**256**	**8,018**

Pots, Tubs and Trays

The infrastructure in the UK by nation to collect pots, tubs and trays is shown in Figure 12, with the same breakdown shown as for plastic bottles.

Figure 12 - Breakdown of Collections of Pots, Tubs and Trays by Country and Scheme Type

Pots, Tubs and Trays				
Country	Kerbside Schemes		Bring Schemes	
	Number of Local Authorities	Number of Households	Number of Local Authorities	Number of Sites
England	193	12,954,657	70	1,967
Scotland	19	1,407,188	10	233
Wales	17	1,006,632	7	202
Northern Ireland	15	405,736	0	0
Total	**244**	**15,774,212**	**87**	**2,402**

Infrastructure

Changes in Collection Tonnages and Rates

The overall plastics packaging collection tonnages were reported in the *Collection Rates* section. More detailed data that relates to the kerbside and bring services by nation, and changes from the previous year are detailed here.

Figure 13 summarises these changes by tonnage and percentage. This reflects the modest increases reported, which were the result of a far more refined dataset as described in the *Methodology* and *Collection Rates* sections (on pages 13 and 20).

Figure 13 - Changes in Collection Rates between 2011 & 2012 by Plastic Format & Collection Scheme Type

2012	Kerbside		Bring		TOTAL	
	Tonnage	% Change	Tonnage	% Change	Tonnage	% Change
Plastic Bottles	▲ 11,245	▲ 4.3%	▼ -1,450	▼ -3%	▲ 9,795	▲ 3.2%
Pots, Tubs and Trays	▲ 3,518	▲ 3.1%	▲ 497	▲ 6.4%	▲ 4,015	▲ 3.3%
TOTAL	▲ 14,763	▲ 21.6%	▲ 3,087	▲ 5.9%	▲ 13,810	▲ 19.3%

Plastic Bottles

Overall there was a 3.2% (9,795 tonnes) increase in collections tonnage for plastic bottles by Local Authorities in the UK in 2012 compared to 2011. This increase was because of a 4.3% increase from kerbside schemes (11,245 tonnes), as there was a small 3% (1,450 tonnes) decrease in collections from bring schemes. Bring scheme tonnages have experienced minor fluctuations in recent years, and it is not thought this decrease is the beginning of a more general and prolonged reduction of this scheme type to collect plastics (please see the *Bring* Section on page 51 for more information).

The overall 9,795 tonnes consisted of increases in England (10,780 tonnes / 4.4%), Scotland (333 tonnes / 1.4%), Wales (488 / 2.6%), although there was a reduction in Northern Ireland (-1,806 / -17.1%). Regarding the decrease in collections in Northern Ireland, in UK terms the tonnage is relatively small and it could be due to erroneous reported collections from a small number of local authorities the previous year, and with healthy increases experienced in pot, tub and tray collections it is possible that the overall tonnage was correct but the breakdown by plastic format was not precise. However, the ranges are considered large enough to warrant further investigation and the reporting mechanism for the breakdown by plastic format for Northern Ireland will be investigated for the 2014 Survey.

In addition to the kerbside and bring schemes, it is a well established estimate that from the 25,000 tonnes of plastic bottles that are consumed outside of the home from 'on the go' recycling schemes, 9,000 tonnes of this material is collected for recycling. However, this is based on anecdotal evidence and Recoup would welcome better data in this area.

The collection data and percentage increases for the UK for plastic bottles is presented in Figure 14.

Infrastructure

Figure 14 - Breakdown of Plastic Bottle Collections by Country in 2012 and Respective Changes to 2011

		Tonnes	Previous Increase
UK	2011		
	Total Quantity of Plastic Bottles Collected in 2011	306,259	▲ 9.0%
	Through Kerbside Schemes	258,545	▲ 10.6%
	Through Bring Schemes	47,714	▲ 0.9%
	2012		
	Total Quantity of Plastic Bottles Collected in 2012	316,054	▲ 3.2%
	Through Kerbside Schemes	269,790	▲ 4.3%
	Through Bring Schemes	46,264	▼ -3.0%
England	2011		
	Total Quantity of Plastic Bottles Collected in 2011	243,313	▲ 9.2%
	Through Kerbside Schemes	211,380	▲ 11.0%
	Through Bring Schemes	31,934	▼ -1.1%
	2012		
	Total Quantity of Plastic Bottles Collected in 2012	254,093	▲ 4.4%
	Through Kerbside Schemes	221,966	▲ 5.0%
	Through Bring Schemes	32,127	▲ 0.6%
Scotland	2011		
	Total Quantity of Plastic Bottles Collected in 2011	24,497	▲ 9.1%
	Through Kerbside Schemes	19,808	▲ 7.6%
	Through Bring Schemes	4,689	▲ 15.9%
	2012		
	Total Quantity of Plastic Bottles Collected in 2012	24,830	▲ 1.4%
	Through Kerbside Schemes	21,272	▲ 7.4%
	Through Bring Schemes	3,558	▼ -24.1%
Wales	2011		
	Total Quantity of Plastic Bottles Collected in 2011	18,876	▲ 11.8%
	Through Kerbside Schemes	17,661	▲ 13.2%
	Through Bring Schemes	1,215	▼ -5.7%
	2012		
	Total Quantity of Plastic Bottles Collected in 2012	19,364	▲ 2.6%
	Through Kerbside Schemes	17,965	▲ 1.7%
	Through Bring Schemes	1,399	▲ 15.1%
Northern Ireland	2011		
	Total Quantity of Plastic Bottles Collected in 2011	10,573	▲ 5.4%
	Through Kerbside Schemes	9,697	▲ 3.8%
	Through Bring Schemes	876	▲ 26.8%
	2012		
	Total Quantity of Plastic Bottles Collected in 2012	8,767	▼ -17.1%
	Through Kerbside Schemes	8,588	▼ -11.4%
	Through Bring Schemes	180	▼ -79.5%
WDA	Estimated WDA & ROTG Collections	9,000	0.0%

Figure 15 compares the split of collections for plastic bottles from kerbside and bring schemes, the totals of these for England, Scotland, Wales and Northern Ireland, and how they relate to the population split by nation (per capita). The data indicates that England accounts for 80.4% (254,093 tonnes) of total UK plastic bottle collection (this was 79.4% in 2011 and 79% in 2010), so there are minor increases from 2010 to 2012. This can be compared to England's 83.4% proportion of the total number of UK households with at least one usual resident.

Figure 15 - Percentage Comparisons of Plastic Bottle Kerbside and Bring Collections by Tonnage and Per Capita

Country	Kerbside Bottles as % Split	Bring Bottles as % Split	Population as % of UK Total	Overall Bottles as % Total
England	82.3%	69.4%	83.4%	80.4%
Scotland	7.9%	7.7%	9.0%	7.9%
Wales	6.7%	3.0%	4.9%	6.1%
Northern Ireland	3.2%	0.4%	2.7%	2.8%
Unspecified UK WDA and ROTG	n/a	19.5%	n/a	2.8%

Scotland, Wales and Northern Ireland reported 7.9%, 6.1% and 2.8% respectively – they reported 8%, 6.2% and 3.5% in 2011 and 8%, 6% and 3.6% in 2010. As in previous years, the changes in plastic bottle collection levels are negligible on a UK scale from 2010 and are broadly in line with the UK population split.

Pots, Tubs & Trays

With an additional 41 new collection schemes for pots, tubs and trays identified in 2012 and with new collections being introduced and development and expansion of existing schemes, the reported 4,015 tonne (3.3%) increase in pot, tub and tray collections is significantly lower than anticipated. This is likely to be due to far more refined data being collected for this year's Survey, and this was explained in more detail in the *Methodology* and *Collection Rates* (on pages 13 and 20) sections.

Taking this into consideration, there were moderate increases reported for overall kerbside and bring collections in England (1,050 tonnes or 1.1%), Scotland (518 tonnes or 5.9%), with Wales (1,984 tonnes or 18.8%) and Northern Ireland (463 tonnes or 17%) reporting more substantial increases.

Every nation reported increases in kerbside collection schemes for pots, tubs and trays, although Wales produced the largest reported increase of 21.6% (2,039 tonnes). In terms of percentage changes, this was closely followed by Northern Ireland at 417 tonnes (16.5%), Scotland at 3.3% (272 tonnes), and finally England at 0.9% (790 tonnes).

In line with the on-going trend for increases in kerbside collections rather than bring, the majority of the tonnage increase was from kerbside collections (3,518 tonnes) as opposed to bring (497 tonnes).

Substantial increases of pot, tub and tray collections from bring schemes were reported in the 2012 Survey, which were attributed to either a marked increase in the use of bring schemes to collect pots, tubs and trays, or at least changes in the reporting mechanisms that were used. With further large increases reported in the 2013 Survey this data confirms that more bring schemes are widening their collections to include pots, tubs and trays in addition to plastic bottles. There was a 41.1% increase in Scotland, which resulted in an additional 246 tonnes being collected. This was followed by a 23% increase (46 tonnes) in Northern Ireland and a 4.4% increase (260 tonnes) in England, which although was the lowest percentage increase it was the highest reported increase in number of tonnes. A 4.9% decrease was reported in Wales, a total of 55 tonnes, and it is deemed to be within an acceptable range to not warrant further investigation.

The data is presented in Figure 16.

Figure 16 - Breakdown of Pot, Tub and Tray Collections by Country in 2012 and Respective Changes to 2011

		Tonnes	Previous Increase
UK	2011		
	Total Quantity of Pots, Tubs and Trays Collected in 2011	120,332	▲ 57.6%
	Through Kerbside Schemes	112,553	▲ 58.0%
	Through Bring Schemes	7,779	▲ 0.5%
	2012		
	Total Quantity of Pots, Tubs and Trays Collected in 2012	124,347	▲ 3.3%
	Through Kerbside Schemes	116,071	▲ 3.1%
	Through Bring Schemes	8,276	▲ 6.4%
England	2011		
	Total Quantity of Pots, Tubs and Trays Collected in 2011	98,253	▲ 57.8%
	Through Kerbside Schemes	92,393	▲ 60.3%
	Through Bring Schemes	5,860	▲ 26.5%
	2012		
	Total Quantity of Pots, Tubs and Trays Collected in 2012	99,303	▲ 1.1%
	Through Kerbside Schemes	93,183	▲ 0.9%
	Through Bring Schemes	6,120	▼ 4.4%
Scotland	2011		
	Total Quantity of Pots, Tubs and Trays Collected in 2011	8,771	▲ 94.3%
	Through Kerbside Schemes	8,173	▲ 81.7%
	Through Bring Schemes	598	▲ 3417.6%
	2012		
	Total Quantity of Pots, Tubs and Trays Collected in 2012	9,289	▲ 5.9%
	Through Kerbside Schemes	8,445	▲ 3.3%
	Through Bring Schemes	844	▲ 41.1%
Wales	2011		
	Total Quantity of Pots, Tubs and Trays Collected in 2011	10,578	▲ 42.7%
	Through Kerbside Schemes	9,457	▲ 22.7%
	Through Bring Schemes	1,121	▲ 282.6%
	2012		
	Total Quantity of Pots, Tubs and Trays Collected in 2012	12,562	▲ 18.8%
	Through Kerbside Schemes	11,496	▲ 21.6%
	Through Bring Schemes	1,066	▼ -4.9%
Northern Ireland	2011		
	Total Quantity of Pots, Tubs and Trays Collected in 2011	2,730	▲ 46.5%
	Through Kerbside Schemes	2,530	▲ 52.1%
	Through Bring Schemes	200	▲ 0%
	2012		
	Total Quantity of Pots, Tubs and Trays Collected in 2011	3,193	▲ 17.0%
	Through Kerbside Schemes	2,947	▲ 16.5%
	Through Bring Schemes	246	▲ 23.0%

Infrastructure

The split of collections for pots, tubs and trays from kerbside and bring schemes and the totals of these for England, Scotland, Wales and Northern Ireland and how they relate to the population split by nation (per capita) is shown in Figure 17. The data indicates that England accounts for 79.4% (99,303 tonnes) of the total UK pot, tub and tray collection (this was 81.7% in 2010), with Scotland, Wales and Northern Ireland increasing their proportion from the previous year, reporting 7.5% (9,289 tonnes), 10.1% (12,562 tonnes) and 2.6% (3,193 tonnes) respectively – they reported 7.3%, 8.8% and 2.3% for 2011. As in previous years, the changes are negligible on a UK scale from 2011 and are broadly in line with the UK population split.

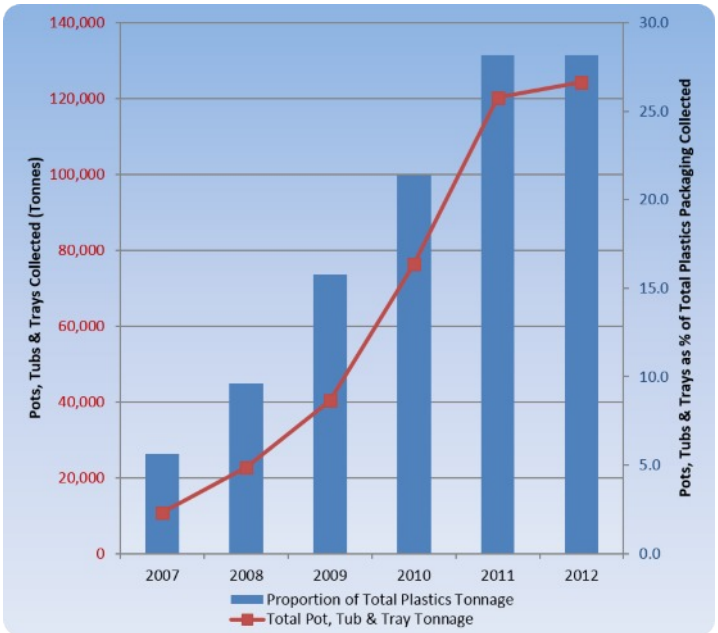
Figure 17 - Percentage Comparisons of Pot, Tub and Tray Kerbside and Bring Collections by Tonnage and Per Capita

Country	Kerbside Bottles as % Split	Bring Bottles as % Split	Population as % of UK Total	Overall Bottles as % Total
England	80.3%	73.9%	**83.4%**	**79.9%**
Scotland	7.3%	10.2%	**9.0%**	**7.5%**
Wales	9.9%	12.9%	**4.9%**	**10.1%**
Northern Ireland	2.5%	3.0%	**2.7%**	**2.6%**

As stated, although the proportions are in line the UK population split, as in the 2012 Survey, Wales are outperforming their UK counterparts per capita based on the reported data, making up 10.1% of the total pot, tub and tray collections and yet their population only making up 4.9% of the UK.

The collection of pots, tubs and trays has seen a meteoric rise since the Survey first reported collection tonnages in 2007, both in terms of the total collected and the proportion of the total plastics packaging collected (see Figure 18). With an overall increase of 208% in just 3 years from 2009 to 2012, collections levels are estimated by Recoup to continue to increase and potentially equal collections of plastic bottles by 2017.

Figure 18 - Pot, Tub and Tray Collection Tonnage and Proportion of the Total Plastics Packaging Collected



Kerbside Schemes

Kerbside collection schemes are the predominant method for the collection of household plastics packaging in the UK. Understanding the factors that affect kerbside systems is fundamental if effective practices are to be identified and implemented. This is especially relevant for plastics recycling, with a number of variables influencing a scheme's operational efficiency, recovery performance and cost.

Plastic Bottles

This section presents analysis into Local Authority plastic bottle kerbside collection schemes, looking at a range of data and considerations for this type of service. These include collection rates by region and country, average collections per household, frequency of collections and the container types used.

Infrastructure Summary

Kerbside plastic bottle collection infrastructure has witnessed dramatic growth, particularly between 2005 and 2009 - 46,918 tonnes being collected in 2005 and 215,576 tonnes in 2009. Several factors could be attributed to the increase in this period, including many new services being launched, existing schemes being expanded and becoming more efficient (such as changing from weekly to alternate weekly collections), and more extensive communications and resident engagement.

In 2012, it can now be confirmed that there are 391 kerbside collection schemes including plastic bottles in the UK, 20 more than were identified in 2011. These collections now represent 96% of the local authorities that operate collections in the UK, and provide coverage for up to 25.3 million of the 26.4 million households in the UK with one usual resident.

These kerbside schemes collected 269,790 tonnes of plastic bottles in 2012, an increase of 4.3% from 2011.

- 96% of local authorities in the UK provide a kerbside collection scheme for plastic bottles
- 269,790 tonnes of plastic bottles were collected from kerbside schemes in 2012 - a 4.3% increase from 2011

Kerbside Schemes

Measuring Performance Indicators

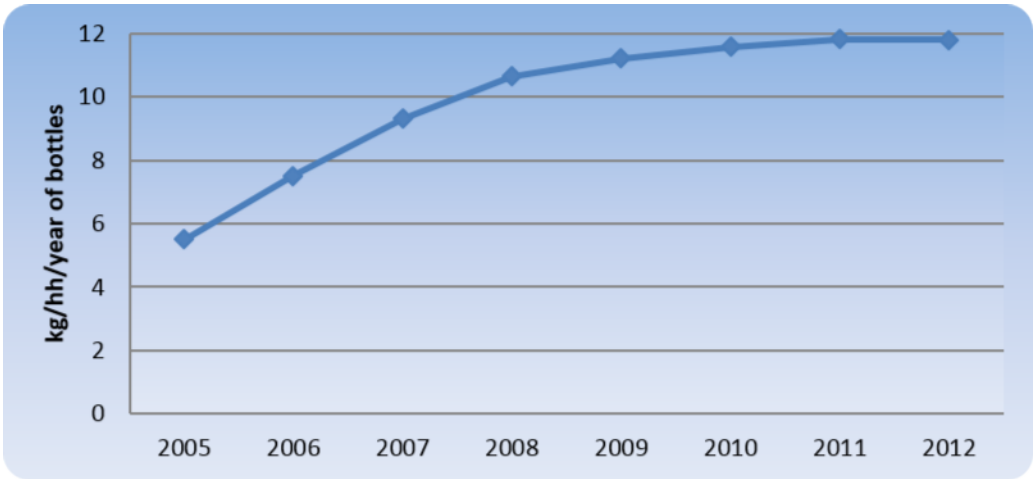
A number of performance indicators are provided for plastic kerbside collections. To validate these indicators the data has been analysed to provide a 95% confidence interval. For example, this means that there is a 95% probability that a local authority's kg collected per household per year for any given parameter will be within a defined range of the average performance reported.

These datasets are provided for indicative purposes only, since a number of factors can influence collection rates, including types and quantity of other materials collected and how the scheme is communicate to residents.

Average Kerbside Collection Rates

The UK has experienced modest average plastic bottle collection rate per household increases since the substantial increase experienced from 2005-2009 (see Figure 19).

Figure 19 - Average Kerbside Collection Rates of Plastic Bottles per Household from 2005 to 2012



In previous Surveys the number of households that receive a kerbside collection for dry recyclables has been reported by Local Authorities. This, when combined with the collection tonnages, provide the average kerbside collection rates (kg per household per year).

Local Authorities provide the number of households that receive a kerbside plastic bottle collection for the Survey. For this year, 302 of the 391 authorities provided the number of households , and although 99 of these were from previous years' data, the 203 that did provide data provides a good indication of the real average collection level, which is calculated as being 11.82kg. This represents a small increase of 0.25 kg (2.2%) from 2010, and modest a 1.18 kg (11.1%) increase since as far back as 2008.

To provide some context about potential collections per household, if all the plastic bottles that were consumed in UK households were collected the average plastic bottle collection rate per household would be over 20 kg.

Kerbside Schemes

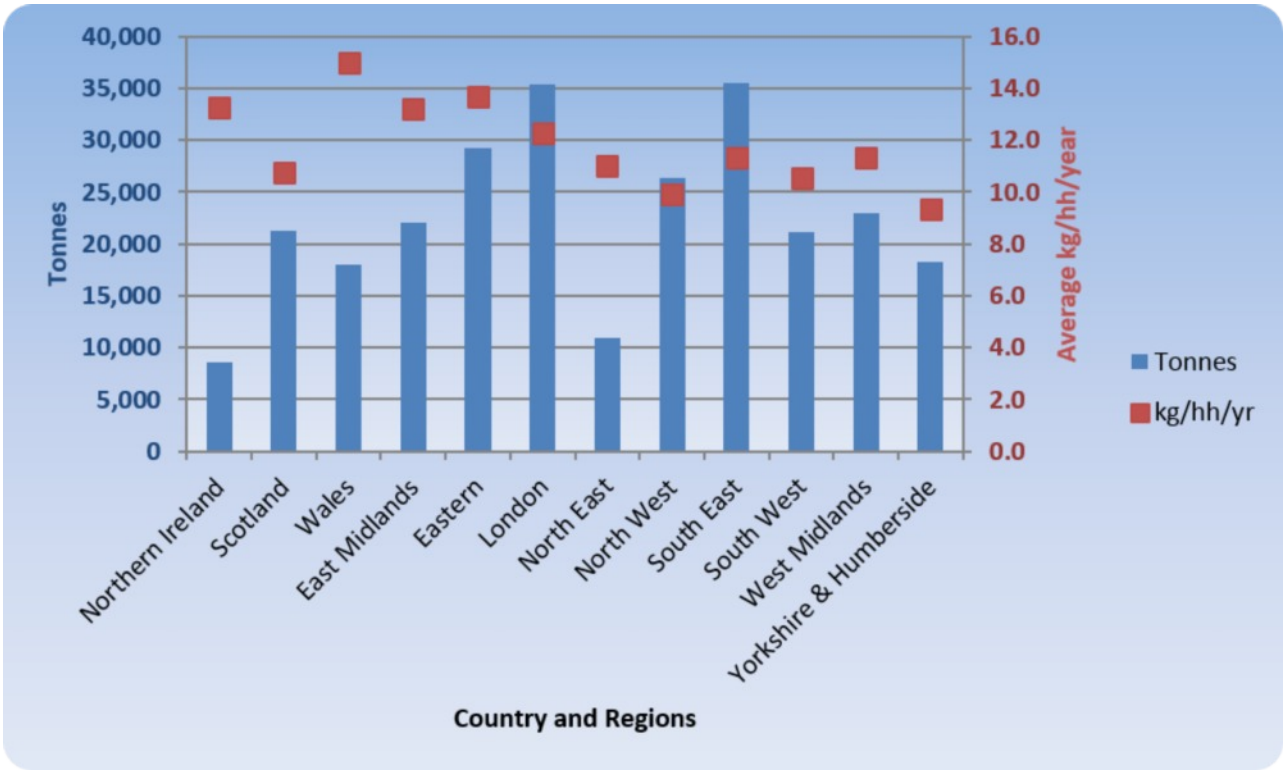
Kerbside Collections by Country and Region

Figure 20 provides a breakdown of kerbside plastic bottle collection by country and region, with two pieces of key data given for each, total reported tonnage collected and average collection per household per year.

The total increase of 11,245 tonnes of plastic bottles was split evenly between the majority of the English regions and Scotland, Wales and Northern ireland. The highest total kerbside plastic bottle tonnage collected was from the South East with over 35,331 tonnes, representing 13.2% of the total UK plastic bottles collected from kerbside schemes. The biggest increase was reported in the East Midlands, where an additional 3,885 tonnes of plastic bottles were reported as being collected for recycling compared to 2011.

Two regions showed reductions, Yorkshire and Humberside (860 tonnes) and Eastern England (4,364 tonnes). There is always an element of potential error in reporting tonnages, and the 860 tonne reduction could be accurate or demonstrate occasional examples of erroneous data reporting. The reduction in Eastern England can be attributed to a combination of of the occasional erroneous data reporting, but also changes in what region local authorities have been placed compared to the previous Survey. The English region data in the 2013 Survey is based on the UK *Office for National Statistics - 2011 Census: Population and household estimates for England and Wales*.

Figure 20 - Kerbside Plastic Bottle Recovery (Tonnes) and Average Collected per Household (kg) by Country and Region



Kerbside Schemes

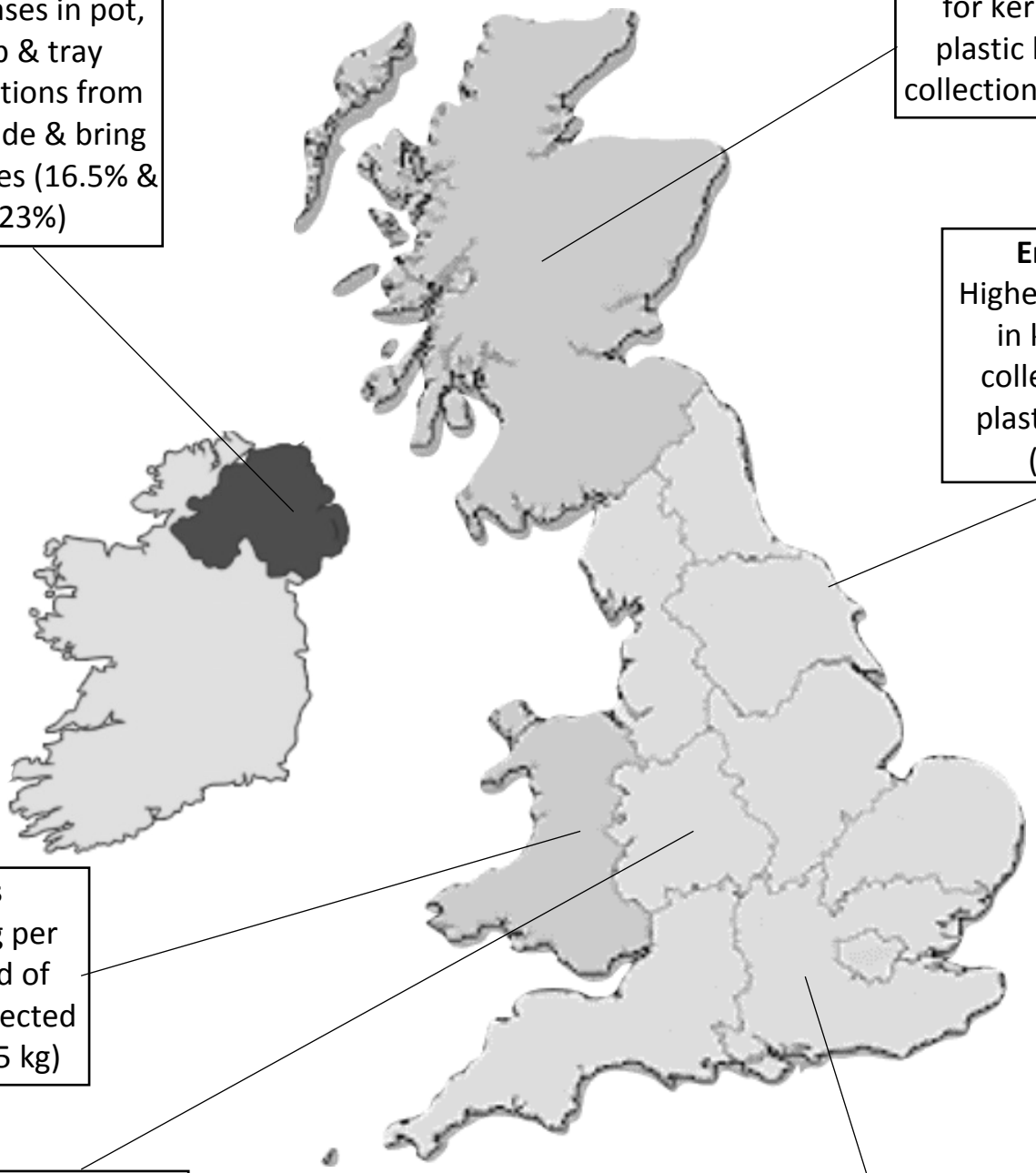
With the knowledge that the average plastic bottle collection rate per household for 2012 was 11.82 kg, four areas reported an average kerbside recovery rate per household of above 13 kg. These were topped by Wales with 15 kg, and then Northern Ireland with 13.3 kg, Eastern England with 13.7 kg and East Midlands with 13.2 kg. The breakdown for the UK is shown in Figure 21.

Figure 21 - Kerbside Plastic Bottle Recovery (Tonnes) and Average Collected Per Household (kg) by Country and Region

Region	Total Tonnage	Average (kg/hh/year)
England	**221,966**	**11.4**
East Midlands	22,093	13.2
Eastern	29,236	13.7
London	35,386	12.3
North East	10,994	11.0
North West	26,302	9.9
South East	35,551	11.3
South West	21,113	10.6
West Midlands	22,978	11.3
Yorkshire & Humberside	18,313	9.3
Northern Ireland	**8,588**	**13.3**
Scotland	**21,272**	**10.8**
Wales	**17,965**	**15.0**

The data indicates that England accounts for 82.3% of the total UK plastic bottle collections, with Scotland, Wales and Northern Ireland representing 7.9%, 6.7% and 3.2% respectively. These proportions are broadly in line the UK population split, although as in the 2012 Survey, Wales is collecting more than would be expected for its population size.

Kerbside Schemes



Northern Ireland
Significant increases in pot, tub & tray collections from kerbside & bring schemes (16.5% & 23%)

Scotland
Largest % increase for kerbside plastic bottle collections (7.6%)

England
Highest increase in kerbside collections of plastic bottles (4.4%)

Wales
Highest kg per household of plastics collected in 2012 (15 kg)

East Midlands
Biggest increase in collected household plastics (3,885 tonnes)

South East
Largest tonnage of household collected in 2012 (35,551 tonnes)

Kerbside Schemes

Container Types and Performance

There are 3 main types of kerbside collection container – wheel bin, box and bags (disposable and re-usable). Some Local Authorities use a combination of these, and for the purposes of this report the prominent container has been used in the data analysis.

Since 2007, the most popular kerbside recyclables collection container has been a wheel bin, and it is now provided as the prominent container for 59% of kerbside plastic bottle collections. This represents an increase of 6% from 2011 and a further 7% increase from 2010, which is a reflection of the increase in commingled collections, the wider adoption of alternate weekly collections and the introduction of the collection of pots, tubs and trays. It is estimated that up to 25.3 million households in the UK receive a kerbside plastic bottle collection service, and on that basis there are now up to 14.9 million households using a wheel bin to collect dry recyclables including plastic bottles.

Boxes accounted for the prominent collection container for 24% of local authorities, covering up to 6 million households, followed by disposable or re-usable bags (17%) which cover up to 5.5 million households. There were reductions in the use of boxes and disposable or re-usable bags, which accounts for the increased use of wheel bins.

Wheel bins typically have a 240 litre capacity, although 120 and 360 litre wheel bins are also used, and boxes usually have a 55 litre capacity. It is also standard practice to use different coloured containers to distinguish between waste, recyclables and organic material, although these are not standardised across the UK. A summary review suggested that there are no fewer than 8 different colours used across the UK for the containers which collect plastic bottles, with green and blue appearing to be the most common colours adopted.

On analysing the weight of plastic bottles collected per household per year (kg/hh/yr), it was indicated that boxes had a slightly higher than average collection performance rate when compared to other container types:

- Box: 12.7kg/hh/yr
- Wheel Bin: 11.8kg/hh/yr
- Bag: 11.6kg/hh/yr

The previous year wheel bins were marginally the highest performing container, and although there are reasonable ranges where the data might change each year, this increase could be attributed to the implementation of multiple box systems, such as the stackable box system shown opposite.

Kerbside Schemes

Participation Rates

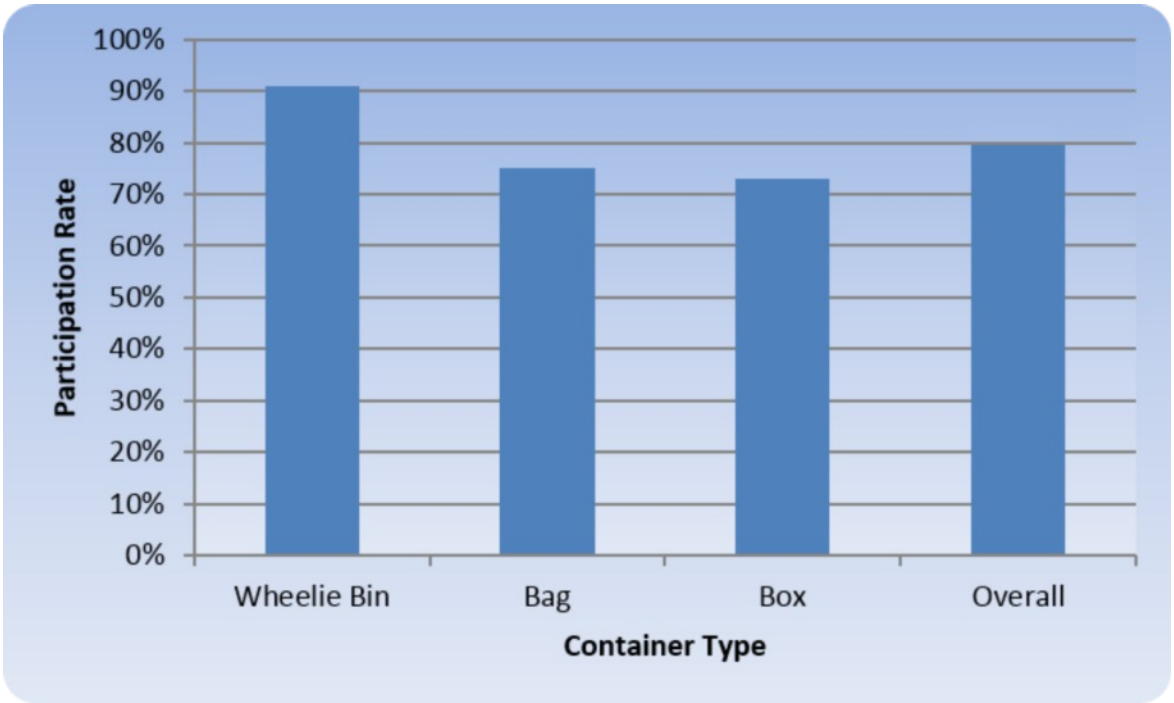
Participation rates reported have always varied widely, and it is no different for 2012. Whilst scheme participation is not compulsory, factors such as frequency of the refuse collection can significantly affect participation levels when reviewed by container type, taking into account both the capacity of the recyclable container and space that residents have to store them.

With plastics an integral part of dry recyclables collections, the Survey asked for the overall participation rate for all materials, and not just for plastics. There were 177 responses and the reported individual kerbside participation rates varied widely. With participation rates ranging from 14% to 100%, an average of 75.6% represented a 2.9% decrease from 2011.

Figure 22 shows the average kerbside participation rate by container type, and there are negligible increases on the previous year's data. This demonstrates that household participation rates by container type are still higher for local authorities operating wheel bins, with an average of 91% participation reported (a 4% increase from 2011). Average participation rate for reuseable and disposable bags were 75% (up 2% from 2011), and 73% for boxes (up 4% from 2011).

The higher rate for wheel bins is thought to be directly related to the more common use of wheel bins where alternate weekly collections are utilised.

Figure 22 - Average Kerbside Participation Rate by Container Type



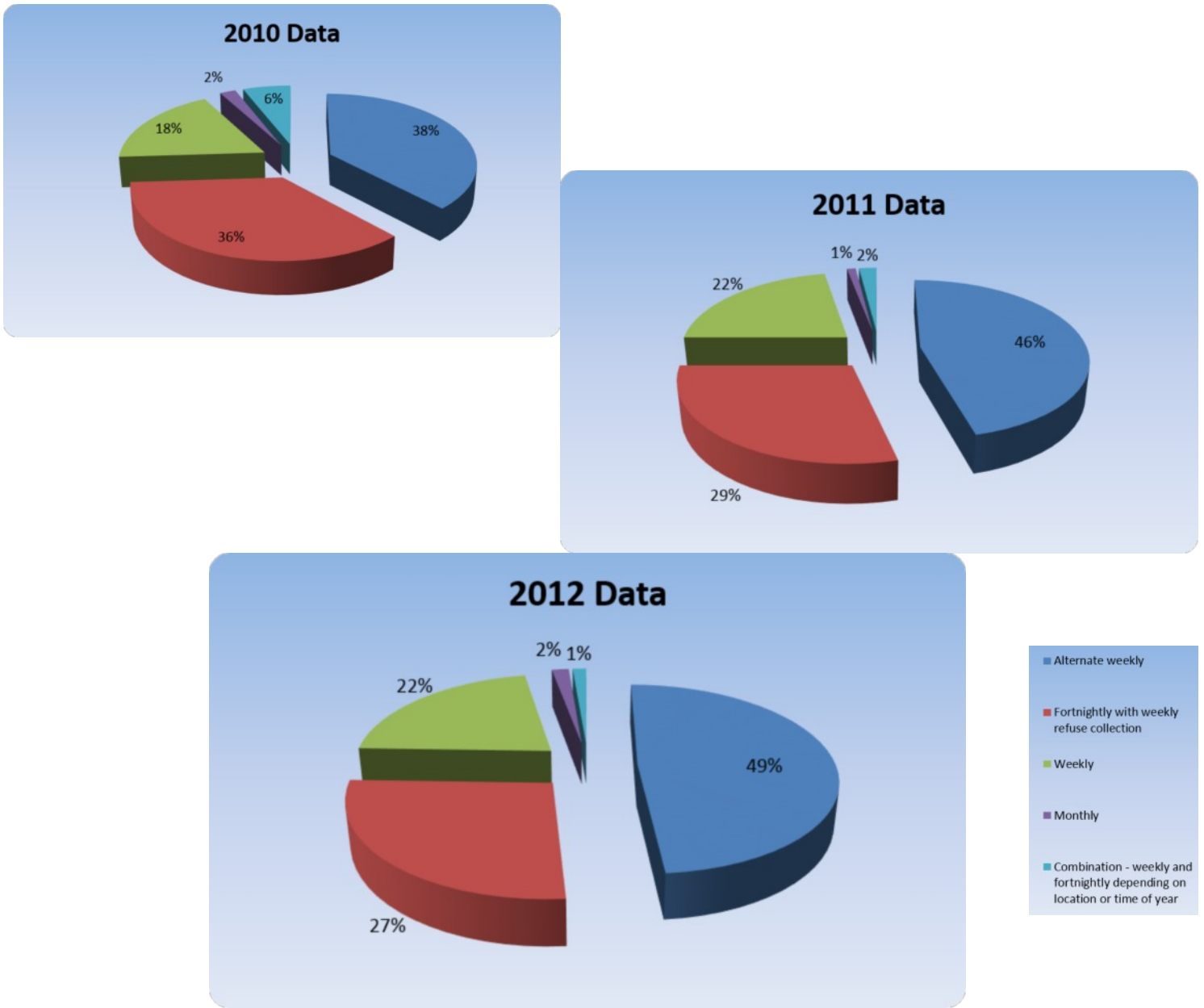
Kerbside Schemes

Frequency of Recyclables Collection

The frequency of the recyclables collection is an important factor in the effectiveness of a kerbside recycling scheme. This can typically range from weekly, alternate weekly (with the residual collection), fortnightly, monthly, or a combination of these.

Although the number of Local Authorities providing each type of service has been fairly consistent for 2010, 2011 and 2012, there has been a marked increase for an alternate weekly service with the residual collection (see Figure 23).

Figure 23 - Frequency of Kerbside Plastic Bottle Collection Service



Kerbside Schemes

Overall fortnightly recyclables collections are most popular, covering 76% of Local Authority areas with a kerbside plastic bottle collection. However, when analysed further, 49% of local authorities provide an alternate weekly service with the residual collection and 27% provide a weekly refuse collection, which represents a noticeable shift towards an alternate weekly service in favour of a fortnightly collection.

Weekly recyclables collections account for 22% of Local Authority services, 2% offer a monthly recyclables collection or use a combination of collection frequencies in their area.

When the recyclables collection frequency and container type is combined (see Figure 24), the larger capacity wheel bins are more popular when a fortnightly collection service is provided, representing 72% of the containers used. The box and bag collections are most commonly used with a weekly recyclables collection service, representing 46% and 43% respectively – this was 55% and 34% in 2011, and represents a marked increase in use of bags. All Local Authorities with a monthly kerbside collection and a combination of weekly and fortnightly collection service use wheel bins.

Figure 24 - Container Type Relationship to Recyclables Collection Frequency

Container Type	Weekly	Fortnightly	Monthly	Combination - weekly and fortnightly depending on location or time of year
Wheelie Bin	11%	72%	100%	100%
Box	46%	19%	0%	0%
Bag	43%	9%	0%	0%

Looking at the performance by frequency of recyclables collections, the analysis showed weekly and alternate weekly collections have higher average performance rates for the collection of plastic bottles when compared to fortnightly collections:

- Weekly: 13.3 kg/hh/yr
- Alternate Weekly: 12.1 kg/hh/yr
- Fortnightly: 10.1 kg/hh/yr

When taking into account the total weight of plastic bottles recovered through the different service types, alternate weekly recyclables collection systems collected 131,368 tonnes, followed by fortnightly and weekly collections, with 72,297 and 58,190 tonnes per year respectively. The remaining 7,935 tonnes relates to those schemes which collect monthly or use a combination of weekly and fortnightly intervals depending on location or time of year.

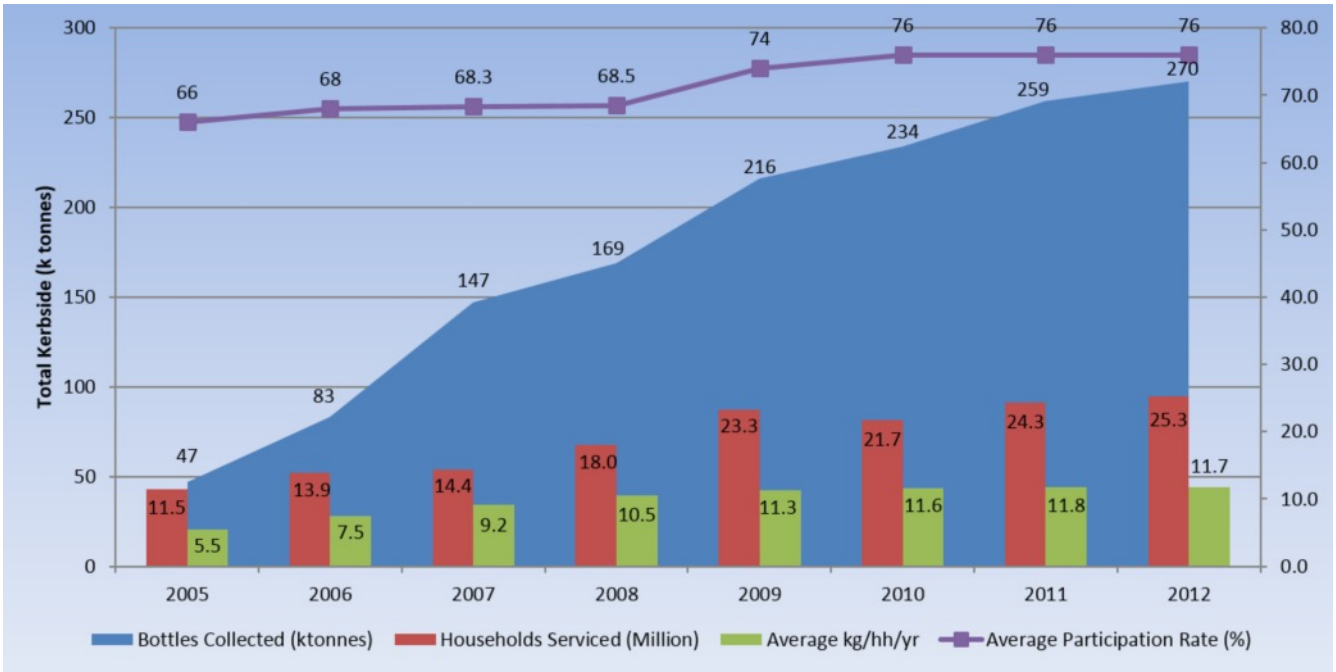
Kerbside Schemes

Consolidated Kerbside Scheme Parameter Trends

Figure 25 combines key indicators for kerbside plastic bottle collections into one summarised sheet, which includes total tonnage, average weight per household, number of households serviced and average participation rate. Although it does not provide direct comparisons, as each dataset uses a different value scale, it can be an effective reference point for mapping kerbside bottle collection development over time. There is clearly an upward trend for each indicator, discounting the 2009 households serviced data anomaly which was corrected for 2010.

Please note that the primary axis (left) refers to the total tonnage (k tonnes), whilst the secondary axis (right) refers to the other indicators – total households serviced (millions), average kg collected per household and average participation rate (%).

Figure 25 - Comparison between Parameters Influencing Kerbside Plastic Bottle Recycling



Pots, Tubs and Trays

The collection infrastructure for non-bottle rigid plastics packaging has seen a meteoric rise since the Survey reported collection tonnages in 2007. Referred to as pots, tubs and trays in this report, these increases are through the expansion of kerbside as well as bring schemes, although, as with plastic bottles, the majority of this is collected through the development of kerbside schemes.

With the momentum increasing to collect pots, tubs and trays, 244 Local Authorities have been identified as providing a kerbside collection in 2012, a 20% increase from the 203 that were identified in 2011. To provide some context around the growth of collections of pots, tubs and trays, there were 114 Local Authorities collecting pots, tubs and trays in 2010, and 59 in 2009.

The 244 Local Authorities potentially cover 60% of all UK households, however, many of these schemes are in their infancy and are gradually being rolled out across the authorities.

Kerbside Schemes

Kerbside pot, tub and tray tonnage has experienced an overall increase of 518% in the past five years, with 18,791 tonnes being collected in 2008 and 116,071 tonnes being collected in 2012. In 2012, the collection rate for pots, tubs and trays from kerbside schemes continued to increase, but not at the rate experienced in recent years. The 3,518 tonne increase to a total of 116,071 tonnes representing a 3.1% increase in collections. This modest increase can be explained due to a far more refined dataset being collected for this year's Survey, which is explained in more detail in the *Methodology* and *Collection Rates* sections (on pages 13 and 20).

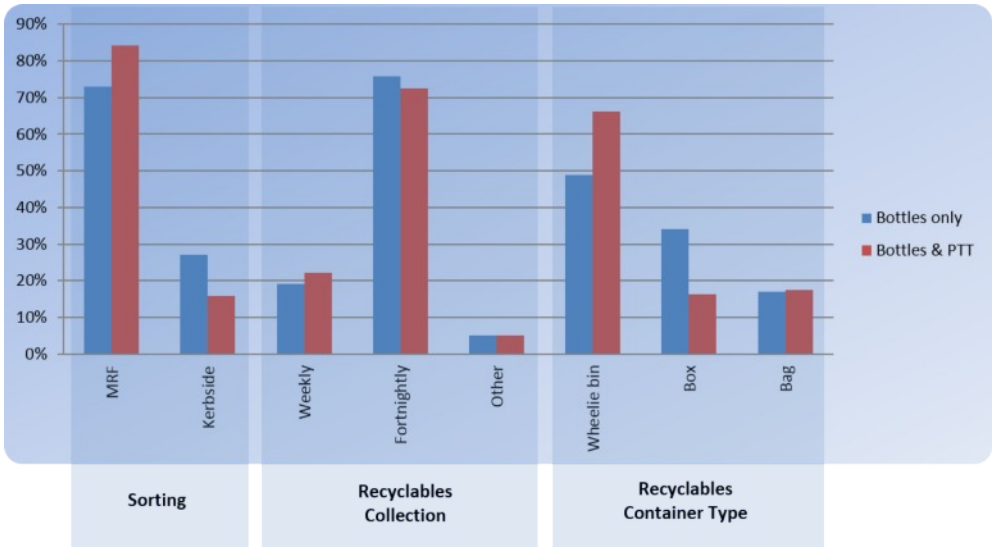
Where a service is provided, the average material collection rate for pots, tubs and trays has also moderated, with 9.82 kg collected per household per year, a decrease of 0.35 kg (-3.4%) from 2011. This follows a 1.64 kg increase in 2011 from the 8.53 kg collected per household in 2010, and the new figure provides a more progressive picture of the collection increases since 2010.

England accounts for 80.3% of total UK pots, tubs and trays kerbside collections, with Scotland, Wales and Northern Ireland, representing 7.3%, 9.9% and 2.5% respectively. As with plastic bottles, these proportions are broadly in line the UK population split, and again, Wales are collecting more than would be expected for their population.

Kerbside Collection Trends

There are a number of differences when comparing kerbside collection services for plastic bottles against those collecting plastic bottles and pots, tubs and trays. Figure 26 shows that where pots, tubs and trays are collected, 84% of kerbside services collect the material commingled and sort using a MRF as opposed to 73% for plastic bottle only collections.

Figure 26 - Plastic Bottle only versus Plastic Bottle and Pots, Tubs and Trays Kerbside Collection Trends



Whether collecting plastic bottles or pots, tubs and trays, all kerbside schemes show fortnightly collections as the most popular. In 2012, there were small changes for sorting and recyclables collection data – whether the material is sorted at the MRF or at the kerbside, or if the collection frequency is weekly or fortnightly (including alternate weekly collections). There was, however, a marked change in the recyclables container type used where plastic bottles and pots, tubs and trays are collected together.

The reported data shows that the use of wheel bins to collect plastics is clearly the most common option - 49% for plastic bottles only and 66% for plastic bottles and pots, tubs and trays. This represents a significant increase in the use of wheel bins to collect multiple plastic formats, with bags showing a noticeable reduction when plastic bottles and pots, tubs and trays are collected together (23% to 18%). The use of boxes is the third most common option where plastic bottles and pots, tubs and trays are collected together (16%), however, the use of boxes was far more prominent where plastic bottles only were collected (34%).

Kerbside Schemes

Plastic Film

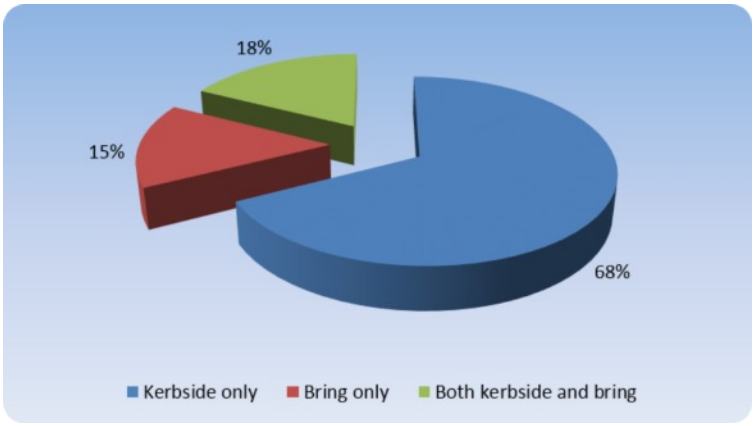
Collection schemes for household flexible plastics (plastic film) are gradually being introduced, and this is the second Recoup Survey that has asked for data relating to its collection from the UK household waste and recycling systems.

It has been established that many of these schemes actually use a bag for the collection of recyclables, and only accept carrier bags within the collection and not other plastic film.

The collection of plastic film should be approached with caution. There are a number of practical barriers which prevent film being compatible with many existing UK collection and MRF systems, contaminating established plastic bottle bales and clogging sorting equipment, and further work is required to find alternative solutions to collect and handle flexible material. Recoup supports any activities and research in this area, as long as it does not interrupt existing collection and reprocessing activities.

In 2012 it was identified that 65 Local Authorities offer a kerbside collection scheme for plastic film, which accounts for 16% of the 407 Local Authorities that operate collections in the UK. In this Survey it was planned to gain more information about the collection volumes and consequently the sorting, reprocessing and end markets for plastic film. However, there has not been enough detailed reporting to present an overall picture for the UK of the tonnages collected, but it has been possible from the available data to establish that 68% Local Authorities that collect plastic film provide a kerbside only scheme, 15% only a bring scheme, and 18% offering both a kerbside and bring scheme (see Figure 27).

Figure 27 - Comparison of Local Authorities Plastic Film Collection Schemes



Recoup will continue in its efforts to report better collection data, and indeed more information about collection, sorting and reprocessing infrastructure and potential or developing end markets for plastic film, and present this in future Surveys as the information becomes available.

Bring Schemes

Bring schemes are containers located in central public locations such as supermarket sites and car parks, where the public can place their recyclables into, and they were the original method for collecting plastic bottles. According to the reported data around 80% of plastic bottle bring schemes were introduced after the year 2000, with one fifth of all bring schemes running today set up between 2000 and 2003. Nevertheless, with annual plastics collection tonnages for bring schemes around this time having no real pattern there was no correlation between the year of scheme introduction and the tonnages collected.

With the majority of plastics now collected from kerbside schemes they are generally used by Local Authorities alongside kerbside schemes to form part of their recyclables collection provision.

Bring scheme provision across the UK has experienced minor fluctuations in recent years and it is clear that the tonnage of plastics collected from bring schemes has stabilised. On a UK wide basis there are only small changes in the numbers of Local Authorities using bring sites to collect plastics and the tonnages they collect.

In 2012 a total of 256 of the 407 local authorities that operate recyclables collections in the UK collect plastics from bring schemes. In 2011 there was 262 and in 2010 there was 260 local authorities collecting plastic from bring schemes, and Recoup expect the current service provision to remain stable at least until the end of the UK plastics packaging target period in 2017. However, this may be affected by budget restrictions or new contract periods.

How Much Plastics Are Collected Through Bring Schemes?

In total 54,540 tonnes of plastics were collected through bring schemes in 2012, which consisted of 46,264 tonnes of plastic bottles and 8,276 tonnes of pots, tubs and trays. This is an overall 953 tonnes (1.7%) decrease from the 55,493 tonnes collected in 2011, and consisted of a reduction of 1450 tonnes of plastic bottles and an increase of 497 tonnes of pots, tubs and trays. To further demonstrate the stability of collections 52,406 tonnes were collected in 2010 and 52,394 tonnes collected in 2009.

It should be noted these tonnages incorporate reported data for plastics packaging collected through Household Waste and Recycling Centres (HWRCs) run by waste disposal authorities, and also 'recycle on the go' collection facilities.

It should also be noted that reporting tonnage collected from bring schemes is a particular issue for some local authorities. This is because they can be integrated with kerbside or 'recycle on the go' services, and therefore individual weights for these services are not recorded separately from kerbside collections, and are sometimes not material specific.

A common example was that there were reported tonnages for aluminium and steel cans as well as plastic bottles, and the most accurate way to estimate the material weight was to adopt a 50:50 split method – 50% of the weight being plastic bottles and 50% aluminium or steel cans. The issues with reporting collection tonnages are documented in the *Methodology* section.

Bring Schemes

Number of Bring Sites

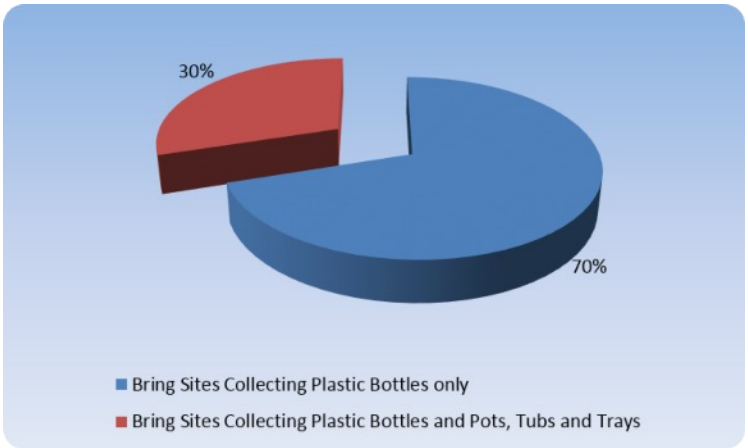
The plastics packaging from bring schemes in 2012 is collected from an infrastructure of 8,018 bring sites across the UK. Although collection tonnages remain fairly constant, there has been a reduction in the number of bring sites in the UK collecting plastics in the past 3 years. The 8,018 is a reduction of 284 sites (3.4%) from the 8,302 sites in 2011, and 783 (-8.9%) from the 8,801 sites in 2010. However, with an increase in the tonnage collected, the bring containers that are in place are experiencing marginal performance improvements.

This reduction in number of sites can be attributed to the increased use of kerbside schemes, with Local Authorities retaining the sites that provide value for money for them and removing the sites which are no longer performing, both in terms of quantity and quality of the plastics collected.

Looking at the plastic formats that are collected in 2012 from bring schemes, 169 (66%) Local Authorities collected plastic bottles only and 87 (34%) collected plastic bottles and pots, tubs and trays. This shows an increasing trend to collect pots, tubs and trays from bring as well as in kerbside schemes. The number of Local Authorities collecting pots, tubs and trays from bring schemes has increased from 36 (14%) in 2009, to 64 (26%) in 2010, and 73 (28%) in 2011 – an overall 142% increase in just 3 years.

In terms of what the individual sites across the UK collect, 5,616 sites (70%) collect plastic bottles only and 2,402 (30%) collect plastic bottles and pots, tubs and trays, which reflects the overall service provision from Local Authorities described above (see Figure 28).

Figure 28 - Bring Sites Collecting Plastic Bottles and Pots, Tubs and Trays



Bring Collection Containers

There are well established types of collection container used for plastic bring collections, with the main 7 container types shown in Figure 29. The estimated plastic bottle capacity is also shown, which is based on 600 plastic bottles per cubic metre. The most established type of unit is the 1,100 litre wheelie bin followed by the 10 cubic yard bank. In addition, local authorities have stated they use other types of bring containers, including the increasingly common 1,280 litre wheelie bin, and also use more than one type of unit. This is particularly the case with Local Authorities that use skips at larger Household Waste Recycling Centres and smaller containers at additional bring sites. The choice for a unit type and size will be dependent upon specific needs such as tonnage collected, type of site, the collection vehicle and the frequency of use by householders.

Figure 29 - Bring Container Types used by Local Authorities and Estimated Plastic Bottle Capacity

Type of Container	Approximate Capacity (m^3)	Estimated Plastic Bottle Capacity
10 Cubic Yard Bank	7.65	4,590
8 Cubic Yard Bank	6.12	3,672
1,100 Litre Wheelie Bin	1.10	660
360 Litre Wheelie Bin	0.36	216
240 Litre Wheelie Bin	0.24	144
Skip	9-36	5,400-21,600

The sites using larger capacity container types tend to collect higher quantities of plastic bottles. For example, single net cage and 10 cubic yard bank systems have large capacities and also report high recovery rates. While, dependent on use, these larger container types should require less frequent servicing, they are not suitable for all bring sites, particularly where space or access is limited. However, there are other benefits of using a net cage system, such as avoiding the need for a bespoke collection vehicle.

Smaller capacity units are often used where a comprehensive network of bring sites and units are in place. This would make it more convenient for householders to access the service, but in making this provision available there would be smaller volumes collected at individual sites, and a more frequent servicing level required.

Bring Schemes

Non-Packaging Plastics

Bring collection schemes for non-packaging are gradually being introduced, and there is evidence non-packaging plastics (such as plastic furniture and toys) are starting to be collected from bring schemes in increasing volumes. This is the only the second Recoup survey that has asked for data relating to its collection from the UK household waste and recycling systems.

There was a total of 9,889 tonnes of non-packaging plastics reported as being collected for recycling in 2012, which is a 24% increase from the 7997 tonnes reported in 2011. Increased efforts were made in this Survey to gain more information about collection volumes, and some Local Authorities indeed reported precise collection tonnage. However, despite this increase, Recoup believe this data is not sufficient to provide an accurate overall total for what is collected across the UK. The lower than anticipated reported collection rates could be due to relatively low collection levels compared to plastics packaging, or that the collection data is simply not available for Local Authorities to report.

A comment received from a local authority in England confirms why collection levels are lower than anticipated:

> "We have explored options for collecting non-packaging hard plastics at our Recycling Centres but the market appears unstable and gate fees quoted make this unviable at present"

Clearly, end markets need to be developed in order to make collecting non-packaging plastics a more commercially viable option and thus to develop the collection infrastructure in the UK. Recoup will continue to strive for better collection data for non-packaging plastics, but also to research and communicate about the developing recycling infrastructure and end markets for this plastic which likely to increase in volumes in the coming years.

Bring Schemes

The Future of Plastics Bring Schemes

A question was asked in this year's Survey whether Local Authorities were planning to remove their bring service in the future. From the 256 Local Authorities that provide a bring service, there were 143 responses, with 118 (83%) stating they were planning to retain their bring service and only 25 (17%) stating they planned to remove it at some stage. The same question was asked in last year's Survey, where 68% stated they were planning to retain the bring scheme and 32% said were planning to remove it at some stage.

Of course, this doesn't necessarily mean the service would definitely be retained or removed, as there is no timescale placed on the question and priorities change. It also doesn't take into consideration any new schemes that might be implemented. However, it does indicate the current opinion within local authorities about collecting plastics from bring schemes. Although bring scheme provision for collecting plastics have reached their peak, the service is likely to remain in place, even if the numbers of sites might be scaled back in favour of relying more on kerbside collections.

For those thinking about the decision to introduce, retain or withdraw a plastics bring scheme, there are many considerations to factor in alongside any cost-benefit analysis of the overall plastics collection schemes operated and how they are seen to provide value for money for residents.

The reasons cited by councils for retaining a bring scheme ranged from it supporting the kerbside collections, meeting resident needs and public demand for the service, and an overflow for people on fortnightly refuse collections or limited kerbside collection container capacity who cannot fit all their plastic items in the kerbside collection container. Another reason given was that bring sites can also be used as a short term option if there were any problems with operating the kerbside service.

The main impact on the provision and scale of a bring scheme is the implementation or performance level of a kerbside collection scheme for plastics. It has been reported that after a kerbside plastic collection has been introduced the plastics collected from the bring scheme can suffer a significant reductions of anything up to 90%. In this scenario, the bring sites should require monitoring to ensure bring scheme efficiencies are maintained, for example, by reducing collection service frequency and ensuring that the appropriate container is used. Some of the other reasons cited for removing the service was high levels of contamination (fly tipping being specifically mentioned) and the cost of running a scheme.

It can easily be deduced from this that every Local Authority must make its own decisions on the specific needs of its residents, whether it be geographical, frequency of the kerbside collections or simply a service the residents feel strongly should be available to them.

The development of collection of pots, tubs and trays certainly demonstrates an area of growth. One very positive comment came from a local authority in Scotland, that they are currently trialling a bring scheme for pots, tubs and trays:

> "We are currently trialling bring scheme for pots, tubs and trays - this is very successful as residents are cleaning their pots, tubs and trays before placing them in the units"

This is clearly a new trial scheme which has been well planned and implemented, and demonstrates that the increasing collection of pots, tubs and trays from bring schemes can be an effective scheme for both residents and the local authority. This may also be viable where the appropriate sorting infrastructure is not available to separate pots, tubs and trays from plastic bottles.

Barriers to Collections

Increasingly challenging UK and EU recycling targets have made it more important than ever to understand the barriers to collections. This in turn can inform both policy development and practical improvements needed as collections increase.

With the focus being on the kerbside schemes to increase collections of dry recyclables, understanding the factors that affect kerbside systems is fundamental if effective practices are to be identified and implemented. This is especially crucial for plastics recycling, with a number of variables influencing a scheme's operational efficiency, recovery performance and cost. These include logistics for collection and disposal, collection frequency, demographics within the collection region such as acorn ratings, ethnicity and language barriers, the size and number of the collection vehicles and the bulking and sorting facilities required.

Bring schemes are still considered by many Local Authorities to be an important part of their collection provision. If the location of the sites, frequency of collections, effective communications to residents are in place and the scheme is well maintained and an acceptable material quantity and quality is being collected, they can be considered to be cost effective and value for money for both the council and residents.

Plastic Bottles

Although the plastic bottle collection rate is now nearly 60%, the average plastic bottle collection rate per household has only experienced modest increases in recent years (see Figure 19) and has plateaued. This is evidence that the provision of kerbside collection infrastructure alone will not allow the UK to reach the 2013-2017 recycling targets. The barriers to increased collection need to be clearly identified and addressed, to ensure all householders are using the service provided for dry recyclables, and that all plastic bottles and as many other plastics requested by the Local Authority are placed in the recyclables collection container.

The 16 Local Authorities not collecting plastic bottles as part of their kerbside service in 2012 were asked for the main reason why a scheme had not been implemented. The most common issues highlighted related to:

- Current inflexibility with the collection contract
- Scheme set up cost
- Logistics, particularly for rural and densely populated urban areas
- Political reasons

However, despite these barriers, with 4 Local Authorities reporting that they would be implementing a kerbside collection that includes plastic bottles in 2013, it is believed the majority of the 12 remaining Local Authorities will be adding plastic bottles to their kerbside collection services by 2015.

Barriers to Collections

On a more general note, Local Authorities were also asked for what they saw as their limiting factors to increase participation and collect more plastics. These centred around:

- Communications – public awareness and education
- Size and number of vehicles for both kerbside sort and commingled collections
- Logistics, particularly for rural and densely populated urban areas
- Actual or perceived restrictions of MRF facilities – both the range of materials that can be handled and the ability to sort plastics from other dry recyclables

Pots, Tubs and Trays

Pots, tubs and trays are far more complex than plastic bottles in terms of size, shape and polymers (and their properties), and as a result the recycling infrastructure, from sorting technologies to limited end markets, have created significant barriers for Local Authorities both collecting, and wanting to collect this plastic format.

Local Authorities that do not offer a collection service for pots, tubs and trays have stated the main reasons why they have not implemented a scheme. The most common issue related to lack of end markets both domestically and overseas and the general market instability around the demand for the collected pots, tubs and trays, with some Local Authorities also stating they did not want the collected material to be exported. The other issues were perceived operational challenges to include other household plastics in their collections other than plastic bottles, no suitable local baling/handling facility, and, of course, cost.

Investment in infrastructure for sorting technologies is now happening, however, end markets need to be developed to provide the necessary drivers for both implementing a collection for pots, tubs and trays and an outlet for the material that is already collected. Sustainable pack designs will help, and Recoup is active in this area working across the plastics packaging supply and recycling to produce its *Recylability by Design* guidance and completing plastics packaging recyclability assessments.

Barriers to Collections

Fundamentally there also needs to be a greater emphasis on communications and guidance to householders to engage more householders to recycle pots, tubs and trays and to ensure they know what is and is not recycled. Development of the opportunity for these plastics to provide feedstock for Energy from Waste, as is common in other EU countries, may change the estimated collection trends and, again, communications and guidance to residents will be needed to react to these changes and ensure the plastics collected reflect the needs of the recycling chain.

Plastic Film

There are questions over the viability of reprocessing mixed household films, with a number of practical barriers which prevent this material being compatible with many existing recycling systems, contaminating established plastic bottle bales and clogging sorting equipment. Given that plastic bottles, pots, tubs and trays and plastic film tend to be mixed together, few Material Reclamation Facilities (MRFs) have the capability to separate them effectively.

A commercially viable recycling chain for household film needs to be developed, and Recoup will continue to monitor, research and communicate changes in sorting, reprocessing and potential or developing end markets for plastic film.

Common Points

When looking at the key barriers to collect more plastics, it is anticipated that contract issues will be resolved when the existing contracts are completed, but the other issues highlighted will need financial investment, practical help, or political influence to drive an agenda for change. These factors apply for the collection of all plastics, irrespective of whether they're collected from kerbside or bring schemes.

In addition to the immediate practical issues to collect more plastics such as operational costs, the key point is that increased collections need drivers. This includes the developments of end markets for pots, tubs and trays in order the influence decision makers that the collection of this material is both viable and in the best interests of the council and it's residents. The viability of recycling household plastic film also needs research and development and ultimately investment. However, maximising the quality and quantity of both the existing and developing infrastructure is paramount, and this will require significant work to drive behaviour change and consideration of how to raise the profile of plastics recycling to all householders and decision makers.

Practical initiatives such as the National Plastics Communications Initiative being developed by Recoup will become increasingly important and should be a key component to ongoing effective communications to residents. More information about this initiative can be found in the *Communications* section (page 83).

UK Target Update

The UK is now in the first year of the government's 5 year recycling targets for packaging waste for 2013 to 2017, and the UK's recycling performance will be judged on increasingly tough targets, and the real focus is on plastic packaging (see Figure 30).

Figure 30 - UK Plastics Packaging Recycling Targets 2013-2017

	2012	2013	2014	2015	2016	2017
Paper	69.5%	69.5%	69.5%	69.5%	69.5%	69.5%
Glass	81%	81%	81%	81%	81%	81%
Wood	22%	22%	22%	22%	22%	22%
Steel	71%	72%	73%	74%	75%	76%
Aluminium	40%	43%	46%	49%	52%	55%
Plastic	**32.0%**	**37.0%**	**42.0%**	**47.0%**	**52.0%**	**57.0%**

Although it is clear that plastics packaging recycling targets will influence a noticeable increase in collection levels between 2013 and 2017, what is unclear is how much plastics will actually be collected and if the targets will or will not be met.

Long term performance profiling of packaging collections is difficult for many reasons, whether they are practical, economic or political. However, with targets, both from the EU and in the UK, estimating future collections is critical to understanding what plastics packaging needs to be collected and what policy, strategic and infrastructure development is needed to meet the targets and ensure support is provided in the right areas.

Extensive profiling work has been completed Valpak's *Plasflow 2017*, which Recoup contributed to. This maps the flow of plastics packaging from consumption through to end markets in order to develop a range of compliance scenarios for meeting the 2017 plastic packaging recycling targets. This report is available to download on the Valpak website, and the consumption and recycling tonnage target is described in pages 20-24.

In terms of actual information reported by Local Authorities, it can be confirmed that the following number of schemes are planned to be implemented in 2013:

- Plastic bottles – 4 new schemes planned for 2013, taking the number of Local Authorities that do not operate recyclables collections that includes plastic bottles down to 12
- Pots, tubs and trays – 20 new schemes planned for 2013

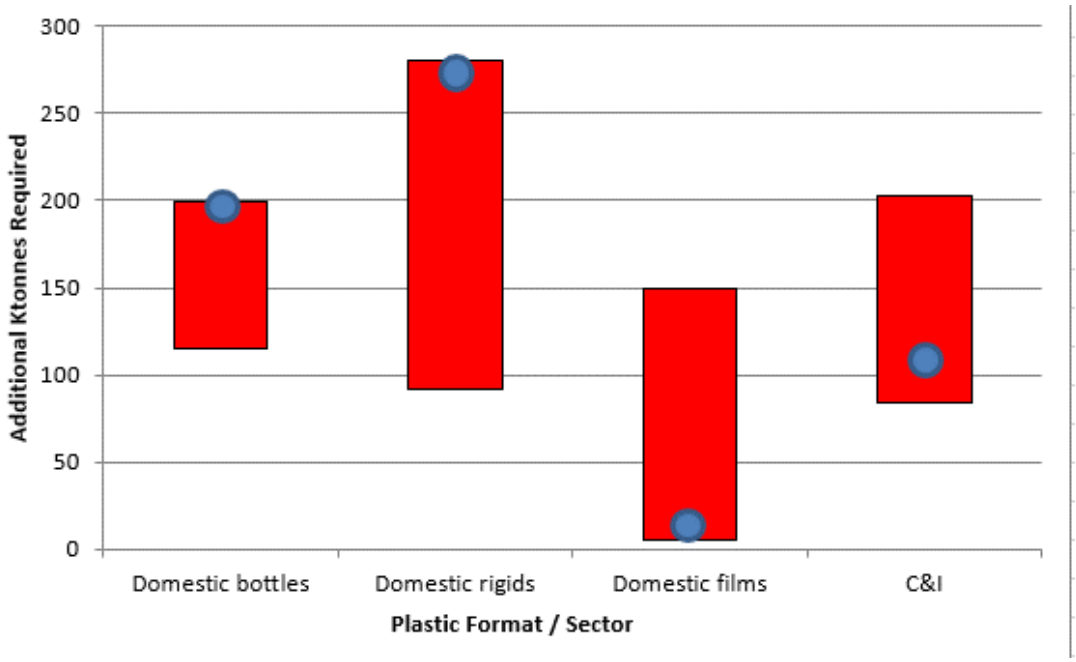
It is difficult to relate this directly to the tonnages collected, as these schemes may initially be rolled out to a restricted number of households and their true collection potential will not be realised immediately. Looking at the overall picture, it is also likely that there are new collection schemes not disclosed to Recoup. However, it does provide evidence of the increasing collection coverage for all plastic formats, and Recoup will continue to research and report collection levels where possible throughout the 2013-217 target period.

What Collections Levels can be Expected by 2017?

So what are the sources of the increased tonnages needed to meet the targets? Recoup contributed to work that was completed by the Advisory Committee on Packaging (ACP) to estimate the collected tonnage ranges by 2017, giving higher and lower scenarios (see Figure 31). This means if you add up the higher scenario tonnage ranges (top of red bars) the collections levels will overachieve on the targets, and if you add up the lower ranges (bottom of red bars) it means the collection levels will underachieve on the targets. This was completed for each plastic format, and also C&I, which makes up the majority of non-household plastics packaging.

Further work was done by Recoup to pinpoint where the increases would be for each plastic format (the blue dots in Figure 31), and it was estimated that plastic bottles and *domestic rigids* (household pots, tubs and trays) would need to overperform in order to make up the anticipated relative low level of collections for *domestic films* (household films) and plastics packaging from the C&I sector.

Figure 31 - 2017 Lower and Higher Scenario Tonnage Ranges for Plastics Packaging Recycling by Format & Sector



2012 Plastics Packaging Recycling Performance Update

There were 640,613 tonnes of plastics packaging collected for recycling in 2012, which meant, using the revised plastics packaging data of 2,535,000 tonnes, that the UK recycled 25% of the plastics packaging it consumed. Collections play a vital role in achieving this total. With 440,401 tonnes reported as coming from UK households (69%), it is estimated that the other 31% (200,242 tonnes) is from other sectors, which is mainly from C&I sources.

UK Target Update

The 2017 scenario in *Plasflow 2017* stated that the revised plastics packaging consumption data of 2,535,000 tonnes for 2012 will increase to 2,868,000 by 2017. The projections being based on a 2.5% increase in plastics packaging consumption . With the 42% recycling rate target in 2017, the collection target stated in *Plasflow 2017* is 1,213,000 tonnes. Although this is for plastics packaging from all sectors, it does provide an indication of the collections needed from UK households to meet the 2017 42% recycling target. If the 2012 split between household (69%) and non-household sources (31%) of the total plastics packaging recycled is applied to the target of 1,213,000 tonnes in 2017, there would be 836,970 tonnes of plastics packaging that needs to be collected from UK households. Almost double the current 440,401 tonne collection level. This information is summarised in Figure 32.

Figure 32 - Mapping the Plastics Packaging Recycling Targets from 2013-2017

Year	2012	2017
Business Target	32%	57%
Actual Target	22.5%	42%
Plastic Packaging Consumption Based on 2% Annual Increase	2,535,000	2,868,000
Actual Performance	640,613	1,213,000

Although there is only one UK plastic packaging recycling target for the UK, which business target shown in Figure 30, it should be noted why there are business and actual targets shown in Figure 32. The UK plastics packaging target are for obligated businesses i.e. business that are obligated under the UK packaging regulations in that they handle over 50 tonnes of plastic for year or have a turnover of over £2 million. This then, in effect, creates an actual overall target, which includes the plastics packaging for both obligated and non-obligated businesses.

What will the Increased Collections Mean on a Practical Level?

It can be said with some confidence that the emphasis will be on kerbside collections to meet the UK targets by 2017, as it is assumed there will be no changes to bring scheme tonnages until 2017.

The increase in plastics packaging that is collected from households may be achieved through infrastructure developments, improving existing collection service offerings, and reviewing existing systems will be an logical starting point. It might mean the additional tonnage can be handled through existing systems and that optimising those systems will be sufficient. However, more expansive changes might be required, such as looking at collection frequency, crew numbers, vehicle routes and also the bulking and sorting facilities required.

Other examples could include looking at the type and size of collection containers needed, and even whether to ask more fundamental questions such as would a commingled or kerbside sort scheme be most beneficial. Collecting additional plastics may also lead to collecting more non-plastic materials. Irrespective of the approach, the quality of material supplied to reprocessors must also be considered.

The key though is that increased collections will need drivers. This includes the developments of end markets for pots, tubs and trays in order the influence decision makers that the collection of this material is both viable and in the best interests of the council and it's residents. However, maximising the quality and quantity of both the existing and developing infrastructure is paramount, and practical initiatives such as the national plastics communications being developed by Recoup will become increasingly important.

Sales, Markets & PRNs

The collection and recycling of plastics entering the UK household waste and recycling systems remains primarily focused on plastic bottles, which represent an estimated 72% of household plastics packaging collected and also the greatest market values. Local Authorities tend to target the collection of all plastic bottle formats, which mainly consist of PET and HDPE, but there are small amounts of PP and PVC collected as well.

The reason for this is that drinks bottles, which are predominately PET drinks and HDPE milk bottles, are more likely to be recycled by the consumer than other bottle types such as DIY, bathroom and cosmetic products, which can be made from PP and PVC.

Plastic Bottles

The values for plastics fluctuate over time and are dependent on a number of conditions, with a particular focus always on quality levels and based on baled material delivered to a plastic reprocessor. With 1 tonne of mixed plastic bottles typically attracting an average price of £110.45 per tonne (www.letsrecycle.com) in 2012, the 316,054 tonnes collected for recycling represented a potential value in 2012 of approximately £35 million, with real prices ranging from £24m-£49m based on tonnage prices of £75-£155 respectively. This reflected the reduction in mixed bottle values from 2011, which ranged between £178 and £237 and had an average value of £208.

So how do these values equate to the total collection tonnages in 2012?

Based on the 42% of plastic bottles from UK households that are not collected for recycling in 2012, over 225,566 tonnes are not recycled. If this is combined with an estimated average of 22,000 plastic bottles per tonne, 4,962,452,000 (nearly 5 billion) household plastic bottles were not recycled in 2012. This creates a compelling business case:

- Using the average £110.45 per tonne mixed bottle value, the un-recycled bottles would have a potential average value to reprocessors in 2012 of **£25m**
- Based on the median landfill gate fee for non-hazardous material of £85 per tonne, there would be **£19m** disposal costs in 2012

It should be noted approximately 10% of bottles in the residual fraction will go to Energy from Waste (www.bpf.co.uk/sustainability/efw.aspx), but processing costs have been assumed to be in line with landfill costs for the purposes of this calculation.

Sales, Markets & PRNs

Although the following calculation would be providing an unlikely view of the financial implications, if there was a 100% bottle collection rate, and by combining the potential value of the currently un-recycled plastic bottles and the landfill costs, there would be an additional **£44m** benefit to disposal authorities in the UK versus the current situation today. With landfill costs continuing to increase in the coming years and the increased appetite from reprocessors for baled plastic bottles, the financial benefits to increase collections of plastic bottles are clear.

This figure is nearly half of the **£83m** stated in the 2012 Survey which is based on 2011 data, and emphasises the fluctuations in plastic bottle values. However, either figure represents a significant amount, and sends a clear message that there is a strong market value for mixed bottles.

It should be highlighted that these prices are for mixed plastic bottles. To give a comparison for clear PET and natural HDPE bottles, average prices ranged from:

- Clear PET - £75-£305, with an average of £272.50
- Natural HDPE - £75-£345, with an average of £314.77

The price of a mixed bottle bale is only 41% of a clear PET bale and 35.1% of a natural HDPE bale, which demonstrates the potential additional value of sorted clear PET and natural HDPE bottles. Recoup are aware that additional sorting costs are incurred to achieve these higher values.

Clear PET Bottle Bale

Natural HDPE Bottle Bale

Sales, Markets & PRNs

Pots, Tubs and Trays

With pots, tubs and trays being a recent addition to recyclables collections, end markets and values are yet to develop in the same way as plastic bottles. Recoup believed the majority of pots, tubs and trays were simply baled as mixed (sometimes with bottles) and sold to available export markets, but now there is a growing number of PRFs (Plastic Recycling Facilities) accepting and separating this material.

The value of pots, tubs and trays depends primarily on the level of contamination and Polyolefin content (PP and PE plastics), and they are generally not attracting positive values. The values of pots, tubs and trays referenced in trade press (www.letsrecycle.com/prices/plastics) of up to £20 per tonne or any higher value achieved is likely to refer to material that also includes plastic bottle content, which inflates the value, or are subjected to several appropriate sorting processes to extract the valued sorted Polyolefin plastics, particularly PP.

As the quality levels, markets and values for pots, tubs and trays are yet to develop in the same way as plastic bottles, it is not realistic to put a potential figure on the benefit of collecting the 652,800 tonnes entering the household waste and recycling systems. However, for illustrative purposes, with increasingly high landfill costs, what we do know is that the estimated cost of landfilling or treating the pots, tubs and trays placed in residual bins in 2012 is significant. With the values not yet realised for the 124,347 tonnes of pots, tubs and trays that were collected for recycling in 2012, some examples of the benefits of avoiding landfill for this material are shown below:

- If all the estimated 652,800 tonnes of pots, tubs and trays consumed were disposed of in 2012, based on the median landfill gate fee for non-hazardous material of £85 per tonne, the disposal costs would be **£55.5** million per annum
- If the estimated 528,453 tonnes of pots, tubs and trays that were not collected for recycling in 2012, based on the median landfill gate fee for non-hazardous material of £85 per tonne, would incur disposal costs of **£44.9** million per annum

Therefore the actual cost of disposal is somewhere between **£44.9m** and **£55.5m**. The business case for collecting pots, tubs and trays develops further when actual values are gained per tonne, and with new sorting facilities for pots, tubs and trays being commissioned, once end markets have developed the financial benefits to local authorities in the UK will increase.

Pot, Tub and Tray Bale

Sales, Markets & PRNs

PRNs and Investment in Collections

In the Survey, Local Authorities were asked if they see any benefit from plastic PRN monies. There were 199 responses to this question, and 78 (39%) said yes, 8 (4%) said no, and a significant number 113 (57%) were unsure. The PRN/PERN system is a complex area, and many Local Authorities believe there should be more investment in collections from PRN monies. This was echoed by many Local Authorities, which was summed up well in quotes from 2 Local Authorities in England:

"There should be a share of the PRN funds for Local Authorities to assist in the collection of a greater range and quantity of plastics. Local Authorities offer a good network for the collection of domestic plastics which should be recognised. As local authority budgets are being squeezed, assistance in waste campaigns work from a funding stream such as the PRN system can only be beneficial in helping the industry meet its targets."

"The importance of collections by Local Authorities are essential to meeting new plastics recycling targets. There is a clear lack of investment from PRN monies in collections, both in terms of infrastructure but also increasing the quality of the material collected."

Price Support

In relative terms to other household packaging materials (e.g. metals and glass), with various polymer types and applications plastics packaging is more difficult to recover and recycle. There are four main plastics packaging formats (plastic bottles, pots, tubs and trays, transit packaging and plastic film), and mainly two different sectors (household and C&I).

Recoup have suggested for a number of years that the PRN system needs to be refined by focusing the support of PRN revenue where it is most needed for each plastic type and sector so the necessary collection, sorting, reprocessing and end market development improvements can then be targeted and realised.

Many accredited reprocessors and traders registered to issue PRNs and PERNs use the plastic PRN funding for 'price support', which means that it is rolled into the values offered to suppliers of the material (i.e. the Local Authorities or their service contractors).

The use of PRNs as price support for different fractions of plastic has positive and negative aspects, and Recoup believe that there is an issue over the transparency of where the PRN funding is allocated, and whether it matches the sector priorities. Relating this to household plastics packaging, for plastic bottles, where sorting and reprocessing infrastructure is developed and the key barrier is collection levels, using PRN value as price support for collections is appropriate. But if this PRN value for pots, tubs and trays and plastic film was used for sorting, reprocessing infrastructure and end markets, this would be more appropriate given current barriers.

If the PRN and PERN was targeted where it was needed most, collections could receive the much needed financial support Local Authorities have been calling for.

Sales, Markets & PRNs

Material Sales and Quality

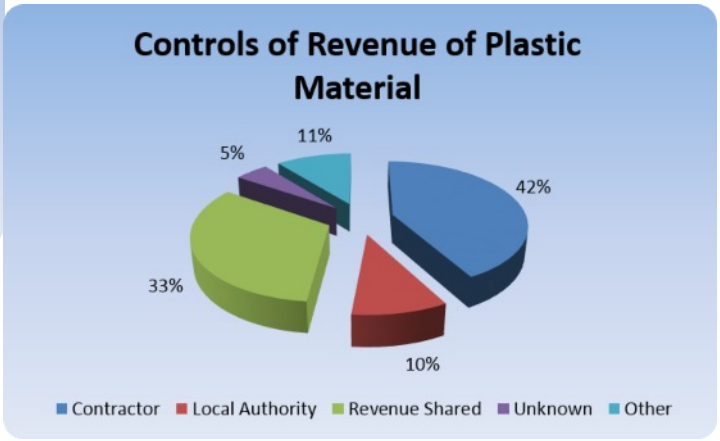
Recoup believe there is a direct relationship between both the quantity and quality of the plastics collected for recycling and having a detailed knowledge of the plastic sales chain, reprocessor requirements and end market applications. Material quality dictates the value of plastics and is critical for sorting and reprocessing facilities to function on a commercially viable basis.

Material Sales

Local Authorities were asked who controlled the plastic material sale and the revenue generated. The results are shown in Figure 33. From 273 responses it was established in 89% of cases it is the contractor who controls the plastic material sale. From 242 responses it was found the contractors also receives a high proportion of the revenue from the sale of the material, with 42% going directly to the contractor and 33% of contractors sharing the revenue with the Local Authority – a combined 75% going to the contractor in some way. These percentage figures are similar with what was reported in the 2012 Survey.

There was 11% who gave a variety of other reasons and comments about who controlled the revenue. This included using the income from material sales by the MRF and/or reprocessor to off-set against the contract price of the material, the local authority being paid a rebate directly from the sale value of the material, and in one instance the local authority receiving revenue for the material collected from bring sites but not from kerbside collections.

Figure 33 - Who Decides Where Plastics are Sold and Who Controls The Revenue



Sales, Markets & PRNs

Material Quality

Many Local Authorities that check the quality of the collected material do so by visual inspections (from the collection crews for kerbside sort or when the material is placed in the MRF), or material composition analysis from the MRF. Material composition analysis is becoming increasingly common to check the quality of the collected material, and this can also be used to provide data so that communications and guidance with residents can be targeted to problem areas and the quality of the recyclate improved.

MRF Code of Practice

A draft Government regulation, the MRF Code of Practice, which is focussed on material quality. The consultation was closed on 26th April and as at September 2013 the Government is analysing the feedback received, and the results of this should be publicised in 2013.

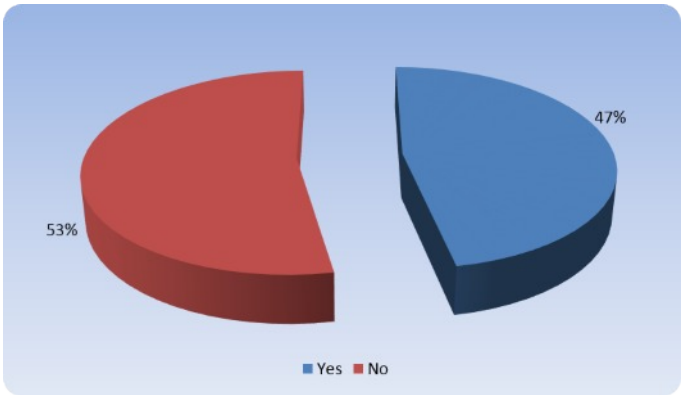
The Practice is a mandatory scheme that requires all MRFs over a certain size to measure the quality of inputs and outputs, with the results being made available to local authorities and those collecting the material as well as recyclers buying the material. The criteria is that all permitted MRFs processing more than 1,000 tonnes of dry recyclates per annum to routinely measure the quality of the input, output and residual waste streams.

The overall aim is to increase the quality that is supplied to recyclers, and although there are costs to implement such a system the government estimates there will be far higher savings through increased material revenue and reduced landfill costs.

Although there are no minimum standards, implementing a transparent system should drive quality improvements and provide a range of consistency in material quality across the recycling chain. There is an argument that the Practice might increase costs for the material to be sorted for local authorities, but ultimately better quality should increase revenues from the collected material, which would be of particular benefit for local authorities involved in profit sharing schemes.

To get an overview of the scale of the quality assurance processes in place Local Authorities were asked about how they monitor the quality of the plastics collected. The result is shown in Figure 34. There were 285 responses to this question, and it was reported that 134 (47%) of Local Authorities monitor the quality of the plastics that are collected, and 151 (53%) do not. This means that there are only 2% more that monitor the quality of their plastics material than the previous year. However, the majority of those who do not monitor quality are passing responsibility to their service contractor.

Figure 34 - Do Local Authorities Monitor the Quality of the Plastic Collected?



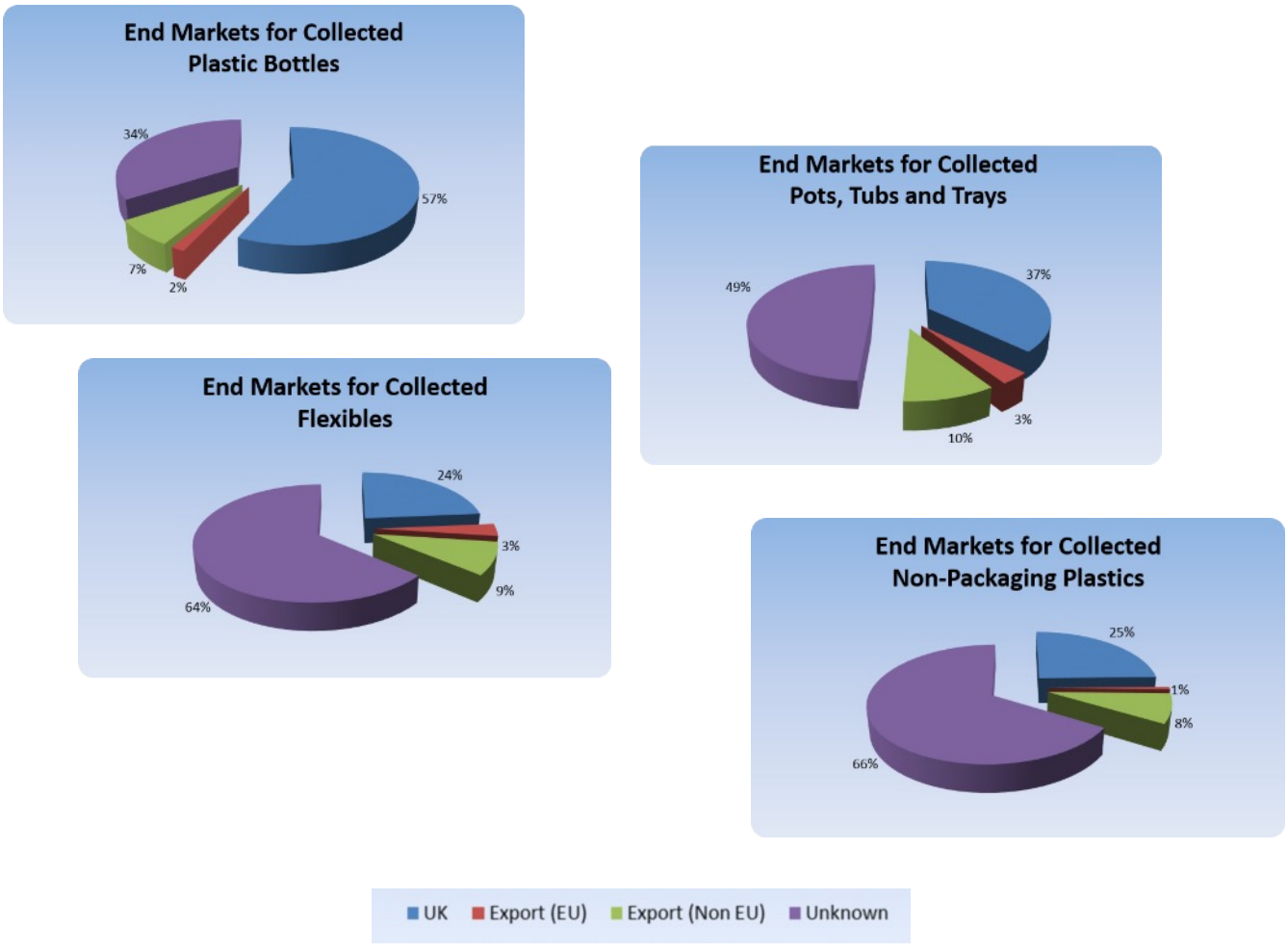
Local Authorities were also asked if they audit the material supplied to the waste contractor/MRF or the reprocessor/end market, and there were responses from 171 Local Authorities. For clarity, end markets are referring to where plastics are reprocessed into granules, pellets or flakes in preparation for use as a raw material in second life applications, and are not necessarily the manufacturer of the second life products. A total of 157 (92%) audit the contractor/MRF, with 21 of these vigorous in this process by also auditing the reprocessor/end market as well.

This demonstrates material audit trials are in place for many Local Authorities, but less of a priority is placed on monitoring the actual quality of the collected material. Of course, there are cost and resource implications for analysing collected material, but if quality as well as quantity was central to household collections, revenue would be greater for material sales, more end market options would be available and the whole industry would benefit. However, with increasingly more demanding budget cuts and with the fundamental operational need to collect the material rightly having to be the priority for local authorities, incentives from Government to invest in increasing material quality need to be high on the agenda, particularly when new legislation is considered. New regulations being considered at present includes the MRF Code of Practice, which if implemented with the necessary infrastructure support, could drive increased quality levels and ultimately revenue for the collected material.

End Markets for the Collected Plastics

To develop an understanding of the flow of plastics that are collected and their end markets local authorities were asked to indicate where their plastic material was sold. As mentioned above, to clarify, end markets are referring to where plastics are reprocessed into granules, pellets or flakes in preparation for use as a raw material in second life applications, and they are not necessarily the manufacturer of the second life products. The responses for each of the plastic formats - bottles, pots, tubs and trays, flexibles and non-packaging plastic, are shown in Figure 35.

Figure 35 - End Markets for Collected Plastics



The figures were similar to what was reported in 2011. The differences to highlight were a slightly increasing proportion of plastic bottles remaining in the UK (57% in 2012 against 53% in 2011) and a slight increase in pots, tubs and trays going to export (non-EU) (7% in 2011 to 10% in 2012), with both decreasing the unknown fraction. Also, there was a 6% increase of plastic film and 3% of non-packaging plastic that went to export (non-EU) instead of remaining in the UK. It should be noted that Recoup believe that the UK market is really an intermediary that sells to export, so the UK data could be artificially high.

The unknown fraction for bottles of 38% was the lowest rate of unknown end markets for all the plastic formats. This makes sense because it is the most established market and there is a continued increasing hunger from UK reprocessors for plastic bottles. The general high level of unknown end markets is most likely to be that the responsibility for sale lies with the service provider rather than the Local Authority, or indeed that the Local Authority may not want to declare it.

Sales, Markets & PRNs

It has always been difficult to provide accurate data on UK versus export end markets, but Recoup estimate that the ultimate destination of approximately 50%-70% of plastics collected in 2012 is export, with 30%-50% staying in the UK for reprocessing. Irrespective of destination, the inherent value of the plastic bottles proportion will lead to them being recycled, and Recoup estimate that 60% of plastic bottles collected for recycling are recycled in the UK - clearly a higher proportion than other plastic formats.

It is expected for the Local Authorities collecting pots, tubs and trays in addition to plastic bottles that a significant proportion will be actually intended to be sold as a lower grade of plastic bottles, and baled together and exported to non-EU markets for sorting and reprocessing. However, it is known that some reprocessors will not accept baled plastic bottles when they contain even a relatively small proportion of pots, tubs and trays. This reduces the consistency of material to end markets, and emphasises the importance of increasing bespoke sorting technology to deal with the ever increasing fraction of pots, tubs and trays.

The high responses that do not know the end markets for flexibles and non-packaging plastic is seen as realistic. There are also questions over the viability of reprocessing mixed household films, and there are a number of practical barriers which prevent this material being compatible with many existing recycling systems, contaminating established plastic bottle bales and clogging sorting equipment. The result of this is that mixed household films collected for recycling often end up in landfill. Although end markets are developing for non-packaging plastic both in the UK and overseas, it is expected the majority of these are baled and exported. With the Chinese Green Fence policy tightening the quality levels of the plastics it receives over its border, this export is subject to the same risks of being rejected as any other low grade and contaminated material.

Sales, Markets & PRNs

Chinese Green Fence Policy

No commentary on plastic sales and markets can be made at present without addressing the subject of the Chinese Green Fence policy. China has always been a relatively accessible option for sending collected plastics that are hard to find end markets for in the UK. As the demand for post-consumer plastic bottles has increased to the current level where UK reprocessors of plastic bottles cannot get enough feedstock for their operations, collections of the mixed plastic formats that currently have limited or no commercial value (pots, tubs and trays and post-consumer plastic film) have increased dramatically. Overall, the quality of plastics exported to China has, if anything, decreased.

With the Chinese aim to become self-sufficient and develop their own raw material, energy and recycling resources and infrastructure, at the current time at least, they have become strict on what plastics they accept over their border. In essence, they are focussing on the 'unwashed' plastics with minimal contamination levels, and they want the high value clean material the UK reprocessors need. The increases in collections of non-bottle plastics packaging in the UK leaves finding end markets for lower grade plastics in the UK more of a widespread problem than the last time China took this stance in 2008. This all means that outlets for the lower grade collected plastics are harder to find, driving down prices of pot, tub and tray prices to negative values and increasing disposal costs for plastics that cannot find end markets.

The collection of pots, tubs and trays is very much still in its infancy compared to plastic bottles, and although opportunities are developing to separate various grades of mixed plastic bottles and pots, tubs and trays as new bespoke plastic sorting facilities come into operation, this process has been slow to react to the increasing collections. With the necessary technologies, recycling infrastructure and associated end markets in the UK not developing fast enough to meet the increased demand for the harder to recycle plastics, intervention is urgently needed. Recoup, their members and the recycling industry have communicated this growing problem for some time.

Contamination levels could reduce significantly, particularly where pots, tubs and trays are collected, by a national plastic communications initiative, and this is something Recoup are currently developing. More information is available on this in the *Communications* section (page 83).

Sales, Markets & PRNs

Products from Recycled Plastics

For those in the plastics recycling chain there is an awareness of the value and versatility of used plastics, whether it be post-consumer or post-industrial. There is a need to increase the understanding of the practical and environmental benefits this can have to a wider audience.

The opportunity to recycle plastics into new products and applications is expanding, and increasing the understanding and recognising this key. If householders understood the range of applications and products recycled plastics could go into, this could provide the necessary nudge factor they need to follow the guidance provided by the Local Authority about what plastics and should not be placed in the recyclables container.

Recycled plastics can totally or partly replace virgin material and reduce manufacturing costs and deliver an environmentally enhanced product. It can also add to a company's environmental credentials such as in carbon footprint reductions, lifecycle analysis benefits or in developing its corporate social responsibility agenda.

There are a wide range of products which include recycled plastics, and these include food grade and non-food applications.

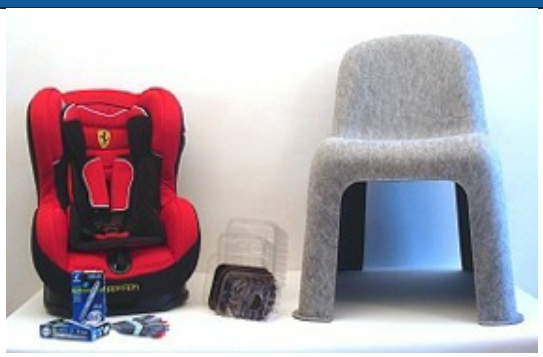
Food Grade

- Bottle to bottle
- Fresh food trays

Sales, Markets & PRNs

Non-Food Grade

- Construction (e.g. pipes, building site screens, scaffolding and kerbstones)
- Garden furniture and children's play areas
- Car seats
- Pens and kitchen utensils
- Paint pots
- Polymer yarn and fibres to produce clothing such as t-shirts and fleeces



Of particular relevance in 2012 for non-food grade products was Charcon Durakerb supplying its lightweight recycled polymer kerbs for the Olympic park site for the London 2012 Olympic and Paralympic games. Durakerb stated each kerb contains up to 182 recycled plastic bottles generated from kerbside collections within the UK.

Also in clothing, Levi is trying to increase its sustainability efforts with its new 'WasteLess' line, which was part of its Spring 2013 collection. Levi stating that each pair of jeans includes an average of 8 recycled plastic bottles.

Alternative Technologies

The term zero waste is a commonly used term, especially when government targets and strategic waste management options are discussed. The question is, can this really be achieved for plastics? Recoup would say no, as it is an inherently complex material group, and not all plastics can be expected to be recycled. However, when mechanical recycling is not feasible, there are alternative options for recovering plastics.

It is common for some plastics collected for recycling in other EU countries to be used in Energy from Waste (EfW) and similar applications, where it cannot be effectively recycled. The energy is captured for heat and power and the facilities are generally positioned in key locations where the outputs can be maximised. As stated in the *Collection Rates* section (page 20), those European countries achieving higher plastics landfill diversion through EfW are also among the highest plastics recyclers according to *Plastics - the Facts,* which is produced by PlasticsEurope each year.

The option to produce second life products such as oil from waste plastics using chemical processes has been in existence for many years, but is now also starting to show signs of increased commercial potential. Otherwise known as feedstock recycling or Refuse Derived Fuel (RDF), this approach uses processes such as pyrolysis to break down polymers into their constituent monomers, which in turn can be used again in refineries, or petrochemical and chemical production.

Zero Waste To Landfill?

If the UK adopt this approach on a wide scale to minimise plastic to landfill, communications will play an important role. EfW is still referred to as incineration by some consumers and has a negative perception. Certainly gaining planning permission for any new development sites can be a long and costly process, with often strong resistance from local residents who do not have all the information available to them to understand the greater potential benefits of these technologies.

There is also potentially a similar issue with the growing trend of pre-treating residual waste through Mechanical Biological Technology (MBT) plants. While plastic containers in these facilities can be separated for recycling, the markets are inherently more limited due to higher contamination levels (as it is derived from black bag waste). Whilst striving for zero waste to landfill, we do not want to discourage the householder from the current accepted practice of sorting recyclables into a separate fraction, which makes the job of recycling plastics that much easier. But if the long-term objective is for total landfill avoidance, then new technologies need to be embraced, and householders need to understand both the benefits of these technologies and also be clear on what materials they should place in their recyclables and residual waste bins.

Alternative Technologies

To gain an understanding of the developing infrastructure in alternative technologies, the Survey asked two key questions.

The first was whether the Local Authority was aware if any plastics collected for recycling go to alternative end destinations such as EfW or RDF. There were 193 responses to this questions, with 21 (11%) stating the plastic they collect did go to alternative end destinations, and 172 (89%) said they did not. For the 21 who said yes, most were unsure of the number of tonnes or what the fraction of the total plastics collected that went to the alternative destinations, but from the data provided this ranged between 2.5% and 50%.

The second question was if Local Authorities were aware if any plastics collected in the residual bins are recovered to go to other residual pre-treatment operations or alternative end destinations. There were 194 responses to this question, and 62 (32%) said plastics collected in the residual bins were recovered, although it was not established how much was recovered, and 132 (68%) stated they did not.

The destination for the plastics are the same for both questions – EfW or RDF – but the data suggests that plastics placed for recycling are far more unlikely to end up in non-mechanical destinations, and recovery of plastics from the residual stream is far more common. At present this is a logical approach, in that the plastics placed for recycling predominantly go to a mechanical recycling destination, whereas plastics placed in the residual containers and ultimately destined for landfill are diverted into energy recovery or chemical or fuel production.

In relative terms to other EU countries, the UK are just starting out on the journey of using what are considered alternative technologies, but as this develops a common sense approach is needed to ensure the plastics and other materials are utilised in the most appropriate way. These developments will need to be reflected in future Surveys as much as is practical to ensure the recovery of plastics is captured as comprehensively as possible.

- 11% of Local Authorities stated the pots, tubs and trays they collect for recycling go to alternative end destinations e.g. EfW
- 32% of Local Authorities stated their plastics placed in residual bins are recovered to go to residual pre-treatment operations or alternative end destinations rather than landfill

Residual Waste Treatment - AmeyCespa

Plastics to Diesel - Cynar Plc

Waste & Recycling Strategies

With an economy merely hovering above recession and the economic growth outlook modest, it is interesting that the UK Treasury predicts growth of 3.1% in the Resource and Waste Management sectors, and even higher growth in more specialist waste such as WEEE (Waste Electrical and Electronic Equipment).

To get a scale of the waste industry, it provides approximately 140,000 jobs and manages around 165.1 million tonnes of material a year resulting in a £11 billion turnover just in England alone. With this in mind, setting intelligent and yet also challenging policy and direction can provide confidence of economic stability, sustainable growth and further investment in the industry.

Developing an understanding of the waste strategies and targets in the UK not only provides essential information of what the requirements are now, but also give an indication of future policy, recycling targets, priorities and activity, and indeed assist local government to plan and react to changes both in the short- and long-term.

This all of course plays a central role in developing plastics recycling, and with the particular focus for the challenging UK plastics packaging recycling targets for 2013-2017, this becomes more relevant for stakeholders in the plastics supply and recycling chain.

Waste Framework Directive

EU Directives currently continue to be the principle driver in the development and implementation of policy and targets for the Waste and Resources Industry across the UK.

The EU directive is the Waste Framework Directive, which was last updated 2008. The Framework provides the overarching legislative structure for the management of waste in EU countries. A key element of this is the 5 steps of the European Waste Hierarchy (Article 4 of Directive 2008/98/EC of the European Parliament and of the Council on waste (Waste Framework Directive):

- Prevention
- Reuse and preparation for reuse
- Recycle
- Recovery
- Disposal

The current plastics packaging recycling rate for the EU member states is 22.5%, which is considered by many to be too low. However, with the requirements of a revised Waste Framework Directive anticipated in 2014, it is likely this will increase.

Waste & Recycling Strategies

England	Wales	Scotland	Northern Ireland
Government Review of Waste Policy in England 2011	Towards Zero Waste	Zero Waste Scotland	Towards Resource Efficiency (under consultation)

Packaging Waste Regulations and the 2013-2017 UK Packaging Recycling Targets

Sitting alongside these waste strategies is the packaging recycling targets for 2013-2017, which applies to all the UK. This is the responsibility of Defra, who implement the *Producer Responsibility Obligations (Packaging Waste) Regulations 2007,* which set targets for the recycling and recovery of packaging waste in the UK.

An interesting question is how does the approaches from the UK nations' devolved waste strategies sit alongside the 2013-2017 packaging targets? Although not immediately clear, an explanation to this could be that the Waste Directive Framework targets need to be met by the UK as a whole, so in effect, if one nation does not perform, the whole of the UK could fail to meet its targets. The packaging targets are designed to "deliver environmental and economic benefits" and ensure the UK meets the EU Directive targets over the next 5 years (Waste Management Plan for England 2013).

There has been no changes in current packaging producer responsibility legislation in the UK despite many calls for this to take place, with particularly strong arguments from plastics reprocessors to incentivise the use of the recycled content in second life applications. There is also opinion that legislation can support collections according to Dave Thomas, Recycling Officer at Rushcliffe Borough Council and LARAC Policy Officer.

"Legislation is the best tool government can use to create incentives, it is also a tool in which incentives can be created for funding cost neutral collections. This in effect will then increase material capture which in turn enables more recycled content, as well as help meet the 2017 target." - Dave Thomas, Recycling Officer at Rushcliffe Borough Council & LARAC Policy Officer

In 2011 (*Government Review of Waste Policy in England 2011*) Defra stated they did not want to amend the legislation as the EU Packaging Directive was due to be revised, the thinking being that if they made changes in a new policy it might have to be revised again depending on what was contained in the revised Directive, and this would result in additional costs to businesses. The current intention being to review the producer responsibility system after the new EU Packaging Directive is published in 2014. There is clearly opportunities here to support collections.

Individual Nation Waste Strategies

Interpretation of the Directives has been handed down to the devolved Governments, with the result that waste policy has a different approach and is being developed at different paces in England, Scotland, Wales and Northern Ireland, with each setting its own waste strategy and subsequent targets. It is also the responsibility for every member of the European Union to produce a Waste Prevention Programme by 12th December 2013.

The Waste Directive is implemented in England and Wales through the Waste (England and Wales) Regulations 2011. Scotland and Northern Ireland have a separate approach. Scotland's is through *Zero Waste Scotland*, which was launched in 2010, and in Northern Ireland it's *Towards Resource Management, the Northern Ireland Waste Management Strategy 2006-2010*, which has just been under consultation. Wales also has their *Towards Zero* Waste strategy and English their Government Review of Waste Policy 2011. This presents a complex structure across the UK. An overview of the recycling targets is shown in Figure 36.

Figure 36 - Comparison of Recycling Targets for UK Nations

England	Wales	Scotland	Northern Ireland
- Currently as per Waste Framework Directive requirements - No new recycling targets	Recycling, preparation for reuse or composting of Local Authority collected ***municipal*** waste: - 52% by 2012-13 (achieved) - 58% by 2015/16 - 64% by 2019/20 - 70% by 2024/25 - 90% recycling/resuse of C&D wastes by 2025	Recycling, preparation for reuse or composting of Local Authority collected ***household*** waste: - 50% by 2013 - 60% by 2020 - 70% by 2025	- Currently as per Waste Framework Directive requirements, but new Recycling Bill just finished consultation and will be implemented in 2014 - Proposed Local Authority collected municipal waste target of 60% by 2020 - Seems likely that it will follow the Welsh model with staggered targets and penalties for failure to achieve targets

England

Government Review of Waste Policy in England 2011

Although the Waste Framework Directive is implemented in England through the Waste (England and Wales) Regulations 2011, currently England's waste strategy is actually based around the *Government Review of Waste Policy in England 2011*.

The current regulations and strategy is heavily driven by use of the Landfill Tax escalator and weight based targets for Local Authorities, and the Government stated it will only intervene where necessary or where there are clear market failures. Recycling targets are currently as per the Waste Framework Directive requirements (22.5% for plastics).

This policy is also where Defra stated it is not going to make changes to the current packaging producer responsibility legislation. The policy stating that the Government wanted to consult on increased recycling targets on packaging producers from 2013 to 2017, and this happened after the 2012 budget. As has been well documented since there has been a particular focus on plastics packaging, with specific objectives to:

- Increase plastics packaging that can be recycled (which is interpreted as being "easy to sort mechanically")
- Increase recycling participation rates for both householders and SMEs (C&I collections)
- Develop sorting and reprocessing capacity for pots, tubs and trays

The objectives look an informed and useful approach to meeting the new targets, but action on these has been slow to be realised, and more action and investment is needed.

Waste Management Plan for England (2013)

Building on the Review of Waste Policy Review in 2011, a Waste Management Plan for England opened for consultation on 15th July 2013 and closed on 9th September 2013, with the results expected later in 2013.

The content of the Plan is driven by the requirements of the Waste Framework Directive and is a compilation of existing waste management information and policies, all centred round the broad aim to ensure that a path is set "towards a zero waste economy". It also speaks of putting in place measures to promote "high quality recycling".

It is effectively responding to the conclusions of the Government Review of Waste Policy in 2011 and to further developments since it was published. In short, it basically gives 2 policy options for England. The first is not to produce and adopt an English waste plan. This would never be an option as it would leave the UK open to infraction proceedings (the legal process by which the European Commission takes a Member State to the European Court of Justice) and to fines potentially being imposed. The second option, is to introduce a waste management plan for England.

It is also supplemented by an Environmental Report produced as part of a Strategic Environmental Assessment that sets out the likely significant effects on the environment from the introduction of the Waste Management Plan for England. This is the responsibility of Defra.

Defra, however, are not responsible for the location of waste facilities, which is the responsibility of the Department for Communities and Local Government (DCLG). Therefore the *Waste Management Plan for England* is also supported by the updated National Waste Planning Policy for England, *Planning for Sustainable Waste Management*, which sets out considerations relating to the location of waste infrastructure. This policy was under consultation until 23rd September 2013.

Overall, there are no new waste management policies in the *Waste Management Plan for England (2013)*, as its purpose is to seek views on whether it and the updated DCLG *Planning for Sustainable Waste Management* will fulfil the obligations of the Waste Framework Directive for England. It is expected the results of this consultation will be available later in 2013.

Wales

Toward Zero Waste is Wales' overarching, long-term plan for resource efficiency and sustainable waste management. Its implementation is via:

- 6 key Sector Plans, including Municipal, C&I and the Food & Retail sectors
- Statutory recovery and recycling targets
- Supporting Waste Prevention Programme (the consultation took place between 28th March and 20th June 2013)

The plan is enforced by mandatory recycling and recovery targets, which state that Local Authority municipal waste must recycle, prepare for reuse or compost:

- 52% by 2012-13 (achieved)
- 58% by 2015/16
- 64% by 2019/20
- 70% by 2024/25

It also states that 90% of C&D wastes must be reused or recycled by 2025. There is also potential penalties of £200 per tonne for every tonne that is under target.

Supporting Waste Prevention Programme

The Waste Prevention Programme, which is currently being consulted on, focuses on the 4Es model of behaviour change for waste prevention - engaging, enabling, encouraging and exemplifying. It proposes:

- Waste reduction by 1.2% per year to 2050
- To achieve 27% reduction in waste by 2025, and "zero waste" by 2050 i.e. either prevented, reused or recycled/composted
- Action is focused at **plastics packaging**, food, paper, card, clothing, and consumer goods

A key objective of the proposed plan is also to break the link between waste generation and economic growth, citing that resource efficiency and waste prevention are vital to a growing and healthy economy. Other areas highlighted was product design (products being designed for disassembly and consequently reuse or recycling) and for recycled materials to be used as far as possible in the Welsh manufacturing processes, using closed loop recycling and upcycling.

Waste & Recycling Strategies

Scotland

Scotland has an overarching, long-term plan for resource efficiency and sustainable waste management, *Zero Waste Scotland*, which "promotes the vision of a Scotland where we waste as little as possible".

This is implemented by the requirements of the *Waste Scotland Regulations 2012*, and the Scottish Parliament has adopted a phased approach to rolling out the key measures in the regulations, with targets stating that Local Authority collected waste must recycle, prepare for reuse or compost:

- 50% by 2013
- 60% by 2020
- 70% by 2025

Safeguarding Scotland's Resources Programme

In addition to the Waste (Scotland) Regulations 2012 the Scottish Government launched a consultation, *Safeguarding Scotland's Resources – A Programme for the Efficient Use of our Materials*, which acts as Scotland's Waste Prevention Programme and sought views on a range of proposals to reduce waste and promote resource efficiency. This proposed an overall target of a 5% reduction in all waste by 2015, and a longer term vision of a 15% reduction in all waste by 2025.

In June 2013 it published its analysis of the consultation responses, with the feedback addressing 4 major areas: business resource efficiency, products and packaging, reuse, and influencing behaviours.

Business Resource Efficiency Service

One of the key aspects raised in 2012 was the development of a dedicated Business Resource Efficiency service "Resource Efficient Scotland", which was launched in April 2013 (www.resourceefficientscotland.com). The new service provides information, advice and support to business and public sector organisations, which includes focussing on supporting SMEs to implement waste, energy and carbon efficiency measures.

Northern Ireland

Northern Ireland's most recent waste strategy was found in *Towards Resource Management – The Northern Ireland Waste Management Strategy 2006-2020*. Recycling targets are as per the Waste Framework Directive requirements (22.5% for plastics).

Towards Resource Efficiency Consultation

The Department of the Environment in Northern Ireland (www.doeni.gov.uk) has consulted on policy options for a Bill that will contain powers to introduce a statutory recycling target for Local Authority collected municipal waste, aptly named *Policy Options for a Bill to Introduce Recycling Targets*.

Waste & Recycling Strategies

The general strategic direction is to move the emphasis from *Toward Resource Management* to *Toward Resource Efficiency*, with the focus shifting to waste prevention and recycling using the waste hierarchy as a foundation for this. This is designed to promote 'green' jobs and ultimately boost the Northern Ireland economy.

Looking at the detail, some fundamental questions are being debated, such as:

- Single target or "stepped" targets
- Who are the obligated parties
- Whether the same targets apply to all
- The definition of 'recycling'
- How the legislation is monitored

It is proposed recycling targets will be dramatically increased, with a mandatory 60% target for municipal waste collected by Local Authorities by 2020 suggested. On the basis of the information in the consultation it appears that this Bill will follow the Welsh model with staggered targets and possible penalties for every tonne that is under target.

The deadline for responses to the consultation was 2nd September 2013, and with the Bill set to be introduced in 2014, communications about the responses to the consultation maybe available later in 2013.

Conclusions

From the evidence it can be seen that Wales and Scotland have set themselves challenging targets and more stringent policy measures, and are starting making real progress, and it looks like Northern Ireland look likely to follow suit with the *Toward Resource Efficiency* consultation.

England is now considered to be lagging behind the other UK nations. With the Waste Management Plan for England not including any new waste management policies, an opportune time to strengthen policy in line with the other UK nations is when the producer responsibility system is reviewed after the new EU Packaging Directive is published in 2014.

However, with interpretation of the Waste Framework Directives being been handed down to the devolved Governments and each nation having its own approach and targets, waste strategy in the UK is confusing to many. This is particularly true for when looking at the UK plastics packaging recycling targets for 2013-2017, which are in place to ensure that the UK continues to meet EU Directive targets over the next 5 years, even though it is not yet clear what the new EU targets will be. From reviewing all the legislation and consultations in the UK it appears the approach that has been taken is that the Waste Directive Framework targets need to be met by the UK as a whole, and the individual policy and targets for England, Wales, Scotland and Northern Ireland should ensure that.

An individual approach for each nation provides strong drivers for resource efficiency, waste prevention and recycling, but with not much differing legislation, strategies and targets, a single clear voice covering these approaches seems a practical way forward to achieve our joint goals and ensure the UK is to be seen as a progressive and innovative leader in waste and resource management.

Communications

The Importance of Effective Communications

With the demanding recycling targets for 2013-2017 now in its first year and with the increases in household plastics packaging recycling being a primary contributor to achieving those targets, there is now a considerable emphasis on improving performance of plastics packaging collection schemes.

Expanding the provision of kerbside collection services alone will not allow the UK to reach the new targets. It is well documented that effective communications to householders can improve the quality and quantity of the material collected. Recycling communications to householders need to be clear, easy to understand and wherever possible consistent for all materials, and considering the range and types, this is particularly true for plastics.

To ensure all requested plastics are placed in the recyclables collection container with a minimum of contamination key messages need to be accurate and be followed. To do this Recoup believe significant work to drive behaviour change and raise the profile of plastics packaging recycling is needed.

Communications used often carry the same general messages about what types of material they collect (e.g. paper, aluminium and steel cans), but there is not an agreed standard approach and the messages are not always easy to understand.

"The need to improve plastic recycling levels further is clear and immediate. Consumers and Local Authorities need clear guidance on which plastics can be recycled and evidence of how their actions are having a positive impact. A national and collaborative plastic recycling communications initiative is well overdue, and I hope that all sectors can come together to support Recoup in making this opportunity a reality."

Lord de Mauley,
DEFRA Parliamentary Under Secretary
for Resource Management

Communications

National Plastics Communications Initiative

The overall aim of the initiative is to achieve a consistent approach to plastics communications across the UK, and that the guidance will become a recognised campaign that is used by all Local Authorities when engaging with the public on plastics recycling.

It is designed to deliver an alignment of information that will help to minimise confusion and contradictory messaging, maximise the potential for the right actions being taken by consumers and ultimately lead to an increased quality and quantity of plastics collected for recycling.

Recoup's aim is that the initiative will become a wide reaching, effective and recognised campaign that is used by all Local Authorities when engaging with consumers on plastics recycling

To do this, there are 3 key strategic objectives:

1. To launch a national plastic recycling communications campaign, providing on-going support to Local Authorities
2. To achieve a consistent approach across all UK Local Authority consumer facing plastics recycling communications
3. To increase the quantity of household plastics collected for recycling to help meet UK plastics packaging recycling targets

The Right Advice?

Ensuring the right and consistent messages are given to householders is central in any communications, but approaches are polarised even when the same contractors or market outlets are being used.

For example, two of the most common questions Recoup are asked concern whether to remove lids from plastic bottles or wash any rigid plastics packaging, and in discussion with leading reprocessors and sorting equipment suppliers, Recoup have found that:

- Plastic bottle lids - looking at the requirements from the major plastic bottle reprocessors the advice is to leave them on
- Washing is not necessary for recycling purposes, however, it does help to ensure plastic bottles are emptied and unused content from pots, tubs and trays are removed before they are placed for recycling

Communications

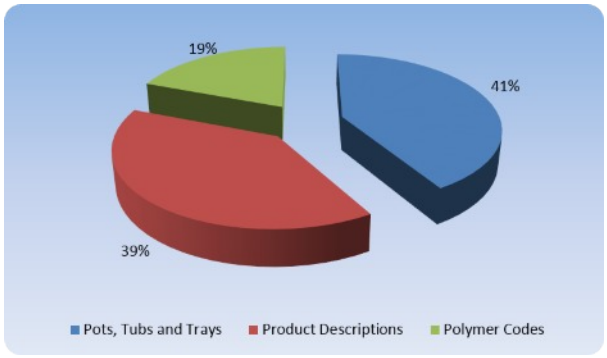
Accurate Terminology?

A major area regarding consumer facing plastic recycling communications that could be improved is concerning the terminology used.

A good example is how non-bottle rigid plastics packaging is referred to, and the Survey asked Local Authorities a question about this. This plastic format is usually referred to in 3 ways – as pots, tubs and trays, their product descriptions (e.g. margarine containers, yoghurt pots or soup tubs), and using the 7 polymer codes.

The results are shown in Figure 37. A total of 159 Local Authorities provided information for this question, and with 234 responses it is shown that many Local Authorities use more than one term. From the responses 41% use pots, tubs and trays, the term endorsed by Recoup and used throughout this publication, 39% use product descriptions and finally 19% use polymer codes. The long standing Recoup view is that polymer codes from all recycling communications used by UK Local Authorities should be removed.

Figure 37 - Consumer Messages Used by Local Authorities for Pots, Tubs & Trays



One of the biggest communication issues is that many Local Authorities state they accept 'all plastics packaging' or 'all plastics'. This was highlighted when calculating the collection tonnage, and when the Local Authority plastics collection service provision was analysed in many cases it was established that they collected plastics bottles and pots, tubs and trays and not plastic film. From this type of message, householders may interpret this that they can include plastic film in their recyclables collection, but this can a detrimental effect. The collection of unwanted plastic film is likely to cause major problems further down the recycling chain as it is not compatible with many existing UK collection and MRF systems, and contaminates established plastic bottle and pots, tubs and trays bales and clogging sorting equipment.

It is also important not to send out conflicting messages. A common example of this is when a collection scheme states 'no polystyrene', but the scheme accepts yoghurt pots, which are commonly made from polystyrene! What these communications are actually referring to is Expanded Polystyrene, which can be found in some plastics trays and also used for protection of products such as electrical items. It could be argued that most consumers would think Polystyrene is referring to Expanded Polystyrene, but with a growing interest in recycling, the potential for this message to be confused is growing.

Communications

Responses from Local Authorities

Recoup have completed independent research to gain an understanding of the appetite from Local Authorities for communications support, to ask what consumer research has been done and what the limiting factors are when Local Authorities are considering or planning a communications campaign.

There was a high level of responses for all the communications related questions, and what is clear is that there is a hunger from Local Authorities to find out more on developing and improving their plastic recycling communications.

The first communication question that was asked was if Local Authorities are a planning plastics recycling communication before the end of the 2013/2014 financial year. There was a total of 239 responses, and the responses are shown in Figure 38.

Figure 38 - Plastics Recycling Communication Plans

Are you Planning a Plastics Recycling Communications Before the End of March 2014?		
Yes	29	12%
Yes, as part of a wider campaign	79	33%
Maybe	37	16%
No	94	39%
Total	239	100%

This meant from the 239 local authorities that responded 61% were planning or considering some form of communications campaign. It should be emphasised that the question was asked whether a campaign was being considered in a particular timescale, before the end of March 2014. From the Local Authorities who were not considering a campaign in this time, a further 31 Local Authorities stated it would be something they would like to do in the future, and this would push the 61% to over 70%. However, this still suggests that 30% are not planning anything.

The limiting factors cited by Local Authorities when considering a campaign were predictably cost and resources, and having to balance these up against other priorities and offer the core service to deliver a dry recyclables collection service to householders.

If a Local Authority was planning or considering a communications campaign they were asked whether they would be willing to consider working with Recoup on plastics recycling communications. Of the 108 responses, 63% stated they would be willing to consider working with Recoup on plastics recycling communications, with 31% unsure. This could be interpreted as not being sure over the practical implications of how a communications campaign would work e.g. what would the communications look like, how it was delivered, and of course, would there be any costs attached.

A major component of any plastics recycling communications initiative is what messages are given to householders, and this forms a key issue. A question was asked if any research had been completed into the messages that are provided to householders, and of the 189 responses, only 28 said they had completed some sort of research. Encouragingly, 16 of the 28 stated they would be happy to share the research with Recoup, and this is something Recoup are following up.

Communications

To get an accurate indication of the tools Local Authorities would find most useful to support plastics recycling communications in their area Local Authorities were asked what they would find most useful. Respondents could choose as many areas as they thought appropriate, and these are shown in Figure 39.

It is not surprising that funding would be the most useful support needed as it is central to developing all other areas, and others areas of support needed were broadly spread between promotional items, images, information and statistics and advice.

Figure 39 - Most Useful Tools to Support Plastics Recycling Communications

What Tools would be Most Useful to Support Plastics Recycling Communications in your Area?		
Funding	137	26%
Promotional Items	113	21%
Information / Statistics	102	19%
Images	82	15%
Advice	74	14%
Unsure	24	5%

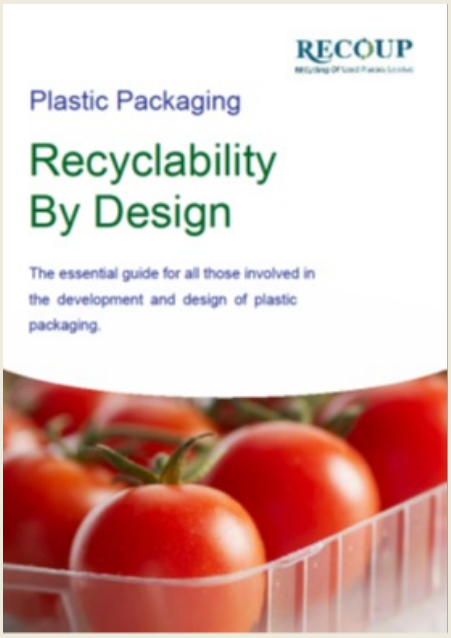
The Next Steps

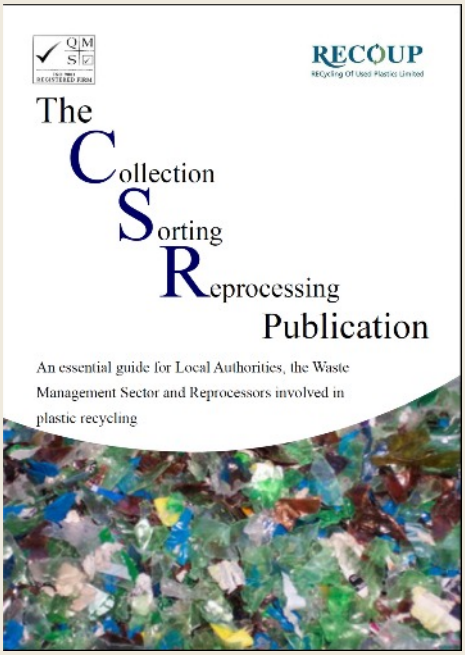
Recoup are currently seeking to build on existing available tools and information, which is now progressing well. This will include a suite of case studies, one of which has been completed by Suffolk Waste Partnership (and is shown below).

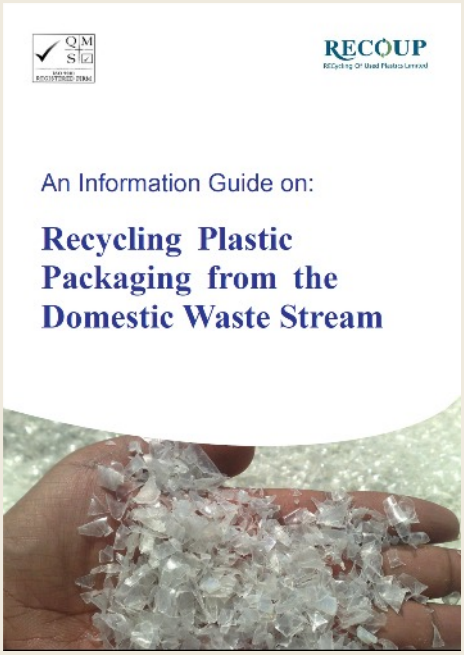
It is anticipated that a new initiative will be implemented by the end of 2013, and if you would like to find out more please contact the Recoup team on 01733 390021.

Recoup Publications

Recoup produce a range of publications and responses to government consultations about plastics recycling which are all free on our website. A technical update for *Recyclability by Design* is being launched on 26th September, and *Collection Sorting Reprocessing* is being published in October 2013.







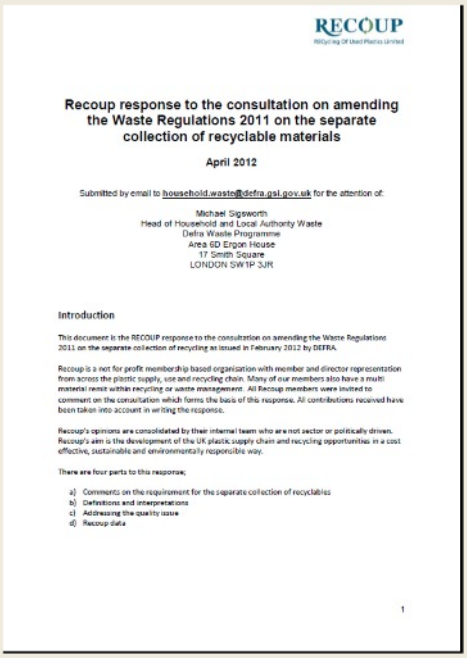


Table of Figures & Acknowledgements

Acknowledgements

Recoup would like to thank all the Local Authority recycling scheme managers and their service contractors who took the time to respond to our Survey.

Recoup would also like to acknowledge the sponsorship from Nampak Plastics, Indorama Wellman Recycling, GlaxoSmithKline and RPC, which has allowed us to cover the costs of completing this work.

This Survey has been supported by the Local Authority Recycling Advisory Committee (LARAC), and in particular Recoup would like to thank Policy Officers Dave Thomas and Andrew Bird.

UK Household Plastics Collection Survey 2013

RECOUP
RECycling Of Used Plastics Limited

Recoup (Recycling of Used Plastics Limited),
1 Metro Centre, Welbeck Way, Woodston, Peterborough, UK, PE2 7UH

t: +44 (0)1733 390021 e: enquiry@recoup.org w: www.recoup.org

@recycleplastics

Recoup