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Annual Local Authorities Plastics Collection Survey 2007

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Executive summary

WRAP commissioned Recoup to undertake a national UK local authority plastics recycling survey. This is the thirteenth such annual survey undertaken by Recoup. The results are based on responses from UK local authorities, of which there are 471, or in some cases, previous survey data and/or information from local authority websites. Work on the survey commenced in November 2006 and culminated in the publication of this report in June 2007.

To gain a more accurate idea of the actual tonnage collected during 2006 calculations have been made to take into account the likely gradual increase in tonnage collected throughout the year. It is therefore estimated that 108,000 tonnes of plastic bottles were collected during 2006, equating to an actual recycling rate of 20% for this year.

Collections are now performing at an annualised rate of 132,000 tonnes per annum, which equates to 25% of bottles in the household wastestream. This continues the trend showing an increasing rate of plastics recycling over the past few years.

Of the UK's 471 local authorities, 92% now offer recycling collection facilities for plastic bottles, ranging from one or two bring sites through to comprehensive kerbside coverage. 434 local authority recycling managers confirmed plastic bottle collection facilities within their council area; although 11 of these were District authorities with County operated Household Waste Recycling Centres (HWRC). This reveals a 7.7% increase in scheme numbers, with a net increase of 31 schemes since the end of 2005. Therefore only 8% of UK local authorities do not currently offer a recyclables collection service to their charge-payers that includes plastics.

13.9 million households in the UK now have the opportunity to participate in kerbside recycling collections that include plastic bottles, equating to 54% of all UK homes. A breakdown by country shows that 54% of households in England, 57% in Wales, 41% in Scotland and 91% in Northern Ireland have a kerbside system that includes plastic bottles.

The continued growth in plastics recycling facilities can be attributed to a number of factors including:

- Increasing pressure for local authorities to provide effective recycling programmes in order to meet recycling targets and avoid rising landfill tax on residual waste
- Government funding
- Increased recognition that plastic bottle recycling facilities can be provided cost effectively
- Improved baling/handling infrastructure
- Strong public demand for the service locally
- An increase in alternate weekly collections
- Increased confidence in markets for collected plastic bottles

Collection scheme design is critical to ensure that the successful expansion of recycling schemes remains affordable. It is also important for local authorities to factor in cost savings in residual waste management when budgeting for recycling. Local authorities already incur significant costs collecting plastics within the conventional wastestream and it is important that this is recognised and taken into consideration so that refuse and recyclables collections can be organised to enable valuable materials such as plastics (in particular plastic bottles) to be diverted from landfill to new product manufacture.

An increasing number of local authorities are now recognising that plastic bottles can be collected for recycling cost effectively. One hundred and eight of the local authorities that responded to the survey reported that it costs them little or no extra to collect their plastic bottles for recycling compared to collecting them for landfill/other disposal route.

The four most important reasons given by local authorities for not including plastic bottles in their recycling schemes were, in order of priority:

- Difficult to add plastics due to use of kerbside sort vehicles – not enough compartments available (35%)
- Have costed a scheme and it is too expensive (28%)
- Currently focussing on heavier materials to hit recycling targets (17%)
- No suitable local baling/handling facility (e.g. MRF) (10%)

These are the same reasons as given in the 2006 survey, however, this year more local authorities are stating the use of kerbside sort vehicles as a limiting factor to the inclusion of plastics, rather than indicating that plastics are simply a low priority due to their light weight and high volume.

Many factors will influence the current and future collection of plastics for recycling. The survey revealed that the provision of plastic bottle recycling within kerbside collections is set to exceed 14.6 million households during 2008, representing 56% of UK households. In addition to this, 8,864 bring sites are expected to be operational by the end of 2008.

Despite the increasing coverage of recycling facilities, existing schemes capture just 25% of plastic bottles consumed in the household wastestream. Although scheme performance is increasing, there remains a need to focus on good practice and the removal of scheme inefficiencies to optimise current systems.

The average quantity of plastic bottles collected from households that are offered this service is now 7.5 kg/hh/annum, an increase of 2 kg/hh/annum on last year. Wheelbins have been shown to perform particularly well, having a higher average recovery rate than either boxes or bags. Given the now fairly comprehensive coverage of plastics recycling facilities throughout the UK, there is an opportunity to start targeting plastic bottles for recycling as part of national campaigns, which should help to increase this further.

Survey results demonstrate that it is important to continue to:

- Move emphasis towards kerbside systems, which on average out perform bring schemes by 4:1
- Increase the performance of existing kerbside schemes
- Provide local authorities with the information required to achieve sustainable, cost effective plastic bottle recycling for a range of different collection methods, including potential solutions for those local authorities operating sort-at-kerb systems that may be limited by vehicle capacity/number of compartments
- Review baling/handling infrastructure in the UK and assess the potential to encourage expansion where necessary and promote the use of suitable equipment
- Communicate to members of the public which plastic items are suitable for recycling in their local authority area and why other plastic items aren't currently collected in that area
- Encourage the provision of suitable alternatives to households unable to participate in kerbside such as tenement properties - work in this area is being taken forward, with a greater number of local authorities trialing and introducing recycling schemes for this type of property

Much work has and is continuing to be undertaken in the past year to address the above points, hence the noticeable increase in both the number of local authorities including plastic bottles in their recyclables collections and in the quantity of bottles being diverted from the residual wastestream for recycling.

With regard to the recycling of other household plastics, 82 local authorities (17%) stated that they were collecting non-bottle plastics. These plastics included various combinations of carrier bags, packaging film, tubs and trays, plant pots, expanded polystyrene and other dense plastics. These local authorities indicated that they had few or no problems with their schemes, yet few of them knew, or chose to state, where the material was being sent for recycling. This may be due to the fact that many of the local authorities collecting non-bottle plastic from the household wastesteam are doing so through contractors, whose responsibility it is to source markets for the material.

It is probable that, until the market for mixed plastic packaging is better developed and understood and UK markets become available, the number of local authorities collecting this material will remain comparatively low. Work will also be required to demonstrate to local authorities that mixed plastic packaging is worth collecting for recycling and can be collected without causing operational issues. It is recommended that case study work be undertaken to further assess those local authorities that are currently collecting other household plastics for recycling in order to progress this.

The findings of this survey show that as recycling targets increase local authorities are starting to investigate new technologies in a move towards more sustainable waste management. This is unlikely to effect the quantity of plastic bottles available for mechanical recycling however, as these will generally be sorted and recycled as they are now. New Energy from Waste (EfW), Mechanical Biological Treatment (MBT) plants and Material Recycling Facilities (MRFs) are due to be introduced over the next few years, with autoclave, pyrolysis and gasification processes also being investigated by some local authorities.

Bioplastics is another 'hot topic' and the findings of this survey show that many local authorities are unsure of potential impacts and have no plans on how bioplastics will be handled as greater quantities enter the wastestream. It is recommended that issues surrounding the collection, handling and disposal of bioplastics should be investigated now, before the market sector grows, so that plans can be put in place for sustainable handling and disposal.

Local authority involvement in away from home recycling, including schools and commercial collections is increasing and it is probable that increasing quantities of plastics will be diverted for recycling through these schemes over the next couple of years.

The information within this document covers all the main elements of household plastics collection systems. It provides current performance data across the UK for both bring and kerbside schemes together with analysis of key operational parameters, costs, local authority perceptions and predictions on future growth.

We would like to thank all recycling scheme managers who have taken the time to respond and have enabled us to compile this document.

Contents

Abbreviations

CA	Civic Amenity
EfW	Energy from Waste
EPS	Expanded Polystyrene
HWRC	Household Waste Recycling Centre
MBT	Mechanical Biological Treatment
MRF	Materials Recycling Facility
UK	United Kingdom
WCA	Waste Collection Authority
WDA	Waste Disposal Authority
WRAP	Waste & Resources Action Programme

2 Introduction and methodology

2.1 Introduction

WRAP commissioned Recoup to undertake a survey of local authority domestic plastics recycling schemes and to use this data to produce a survey report.

The purpose of this report is to enable WRAP to access data, which will support its programme by providing an up-to-date status of the current level of domestic plastics recycling in the UK.

Recoup has undertaken twelve previous UK local authority plastics recycling surveys, including the ones produced on behalf of WRAP in 2004, 2005 and 2006.

2.2 Methodology

Work on the survey commenced in November 2006 and culminated in the publication of this report in June 2007. Recycling managers from all 471 UK local authorities were contacted by e-mail to request participation in the survey. Recycling managers were encouraged to enter data directly into an electronic form accessible over the Internet, although postal/fax back forms were also made available on request.

E-mail reminders were sent to local authorities that did not respond to the initial invitation to participate in the survey. Local authorities that did not respond to the reminder were interviewed by telephone. Where this was not possible (e.g. due to the contact at the local authority being on annual leave etc), data was taken from the previous survey and/or the local authority website (these account for those that did not respond, see Table 1). Data supplied by local authorities over the Internet was entered automatically into the database, whilst data supplied by postal/fax back forms, or through telephone interviews was entered into the database by Recoup.

Data was reviewed and any apparent anomalies checked by telephone with the relevant local authority before analysis. This included comparisons with earlier survey data and other information available to Recoup. Supporting cross-reference information was also obtained from local authority websites and other sources to assist this process and later analysis.

Table 1: Local authority responses

	WCA	WDA	Unitary authority	Responded
England	238	37	116	342 (87.5%)
Wales	0	0	22	20 (91%)
Scotland	0	0	32	27 (84.5%)
Northern Ireland	0	0	26	20 (77%)

Data for this survey was collected at the end of 2006/start of 2007 for the calendar year of 2006. A few local authorities were unable to supply data for this period and provided data based on the 2005/2006 financial year instead. This data was excluded from calculations where changes to the local authority collection scheme took place during 2006.

Reported tonnage data and method used for calculating actual and annualised tonnage

The average of reported kerbside and bring collection rates per home or per site have been applied to all collection facilities known to be in operation at the end of 2006, to provide an annualised tonnage figure for 2006.

Collection infrastructure increased during 2006 however, so to gain a more accurate idea of the actual tonnage collected, calculations have been made to take into account the likely increase based on the known increase in collection facilities.

This was achieved by applying the following process:

1. 137 local authorities and 196 local authorities provided data on the quantity of plastic bottles collected through their kerbside and bring schemes respectively (some of these operate and provided information on both bring and kerbside)
2. The data provided by these local authorities showed that they collected 49,726 tpa and 18,158 tpa of plastic bottles through kerbside and bring schemes respectively, giving a total reported tonnage of 67,884 tpa.
3. However, not all local authorities collecting plastic bottles provided tonnage data. In order to estimate the actual quantity of plastic bottles collected for recycling during 2006 it was necessary to use the tonnage reported by local authorities to obtain an average quantity collected for recycling per home or per site.
4. The average calculated in step 3 was applied to all collection facilities known to be in operation at the beginning of 2006 for which tonnage data had not been reported
5. The growth of additional collection facilities in the local authority areas (for which tonnage data had not been reported) during 2006 was identified.
6. Assuming the implementation of these schemes was evenly distributed during the year, the average scheme performance data from step 3 was applied to assess the quantity of plastic bottles collected from new or expanded schemes in local authority areas for which tonnage data had not been reported.
7. The actual collection level was calculated by adding the results of step 4 and step 6 to the quantity reported by local authorities.

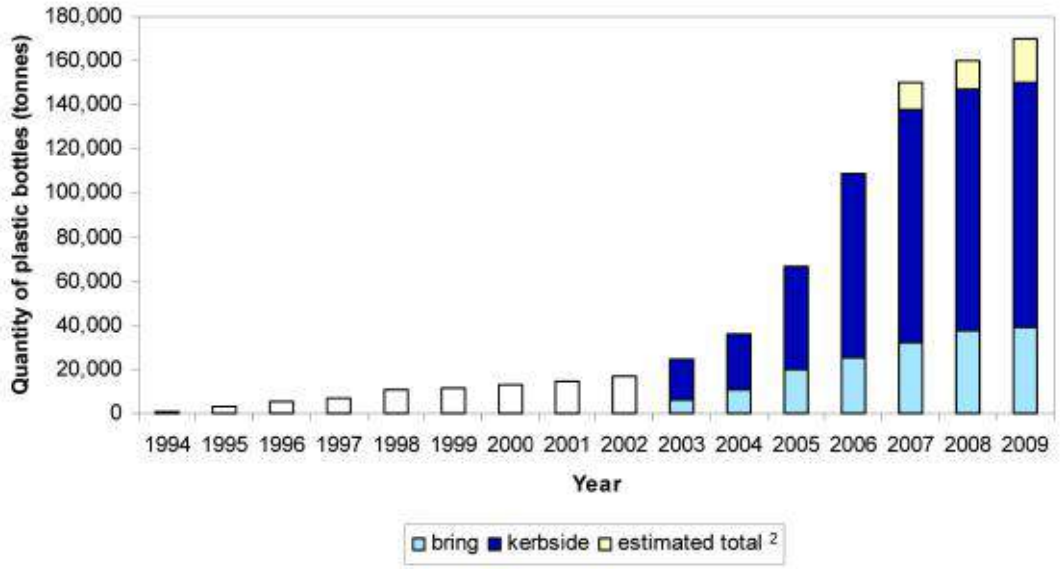
3 Plastic bottle recycling activity

To gain a more accurate idea of the actual tonnage collected during 2006, calculations have been made to take into account the likely increase in tonnage collected throughout the year (See section 2.2 Methodology, page 5). It is therefore estimated that 108,000 tonnes (67,884 tonnes reported) of plastic bottles were collected during 2006 (Figure 1). This is equivalent to 2,700 million plastic bottles, with a volume of 5,400,000 cubic metres. It represents an increase of 61% on the quantity collected in 2005, resulting from an increase through both kerbside and bring collection schemes.

Collections have surpassed predictions based on the 2005/06 survey, which suggested that 89,000 tonnes of plastic bottles would be collected in 2006. This is due in part to the fact that the actual future coverage of collection schemes is generally greater than reported. In addition, previous surveys have shown the average scheme performance to increase year on year. Taking this into account, the 'estimated total'[1] provides an indication of the quantity of plastic bottles that is more likely to be collected, assuming an under-reporting of future coverage by local authorities and a continued improvement in scheme performance.

At the end of 2006, plastic bottle collection levels in the UK had risen to an estimated annualised rate of 132,000 tonnes per annum. This is equivalent to 3,300 million plastic bottles, with a volume of 6,600,000 cubic metres. The annualised rate is based on data provided by local authorities at the end of 2006/start of 2007.

Figure 1: Household plastic bottle recovery in the UK



Approximately 83,000 tonnes (77%) of plastic bottles were recovered through kerbside collections in 2006, with the remaining 25,000 tonnes (23%) being recovered through bring schemes. Responses from local authorities indicate a continuing strong growth in kerbside plastic bottle collections through 2007 to 2009; with a slower growth in bring schemes. Based on current local authority declarations, it is forecast that around 150,000 tonnes per annum of plastic bottles will be collected by 2009.

The total quantity of plastic bottles entering the UK household wastestream is c. 525,300 tonnes per annum. The annualised recycling rate for plastic bottles from household sources is therefore 25% per annum[2]. The actual recycling rate for plastic bottles for 2006 has been calculated as 20%. This is an increase on previous years (for example, 2003, 2004 and 2005 showed a recovery rate of 5.5%, 10.5% and 13% respectively), although there remains clear potential for continued growth.

[1]The 'estimated total' provides an indication of the total quantity of plastic bottles that is likely to be collected, assuming an under-reporting of future coverage and a continued improvement in scheme performance.

[2]Recoup (2006) Taken from work done on behalf of WRAP looking at export markets (NB. The figure used for the 2006 survey was 510,000, which assumed some bottles would be consumed away from home and thus not enter the household wastestream. A 3% increase has been assumed).

Table 2 below sets out the actual quantity of plastic bottles calculated to have been collected during 2006 by country.

Table 2: Quantity of plastic bottles collected for recycling by country

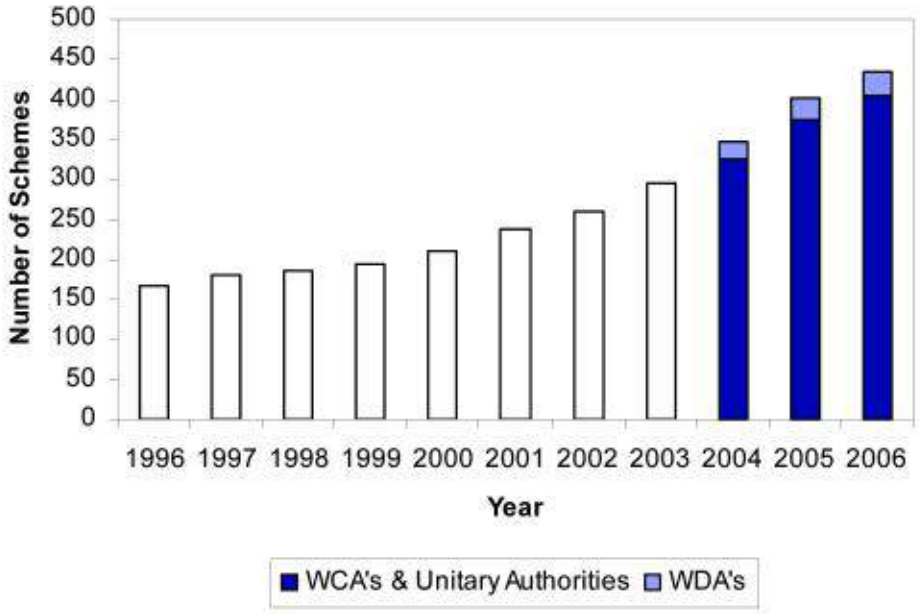
UK (datasets: kerbside: 137 (48%) responses, bring: 196 (54%) responses)	
Estimated tonnage collected during 2006	**108,453 tonnes**
Estimated tonnage collected through bring during 2006	25,346 tonnes
Estimated tonnage collected through kerbside during 2006	83,107 tonnes
Average quantity of plastic bottles per bring site (tonnes/annum)	**4.38 tpa/site**
WDA - Average quantity of plastic bottles per CA site (tonnes/annum)	13.26 tpa/site
WCA - Average quantity of plastic bottles per bring site (tonnes/annum)	4.71 tpa/site
Unitary - Average quantity of plastic bottles per bring/CA site (tonnes/annum)	3.26 tpa/site
Average quantity of plastic bottles per household (kg/annum)	**1.47 kg/hh/a**
WDA - Average quantity of plastic bottles per household (CA sites only) (kg/annum)	0.52 kg/hh/a
WCA - Average quantity of plastic bottles per household (bring sites only) (kg/annum)	1.66 kg/hh/a
Unitary - Average quantity of plastic bottles per household (bring/CA sites) (kg/annum)	1.29 kg/hh/a
Average quantity of plastic bottles collected per household from kerbside (kg/annum)	**7.54 kg/hh/a**
ENGLAND (datasets: kerbside: 104 (47%) responses, bring: 164 (54%) responses)	
Estimated tonnage collected during 2006	**90,524 tonnes**
Estimated tonnage collected through bring during 2006	22,186 tonnes
Estimated tonnage collected through kerbside during 2006	68,338 tonnes
Average quantity of plastic bottles per bring site (tonnes/annum)	**5.25 tpa/site**
WDA - Average quantity of plastic bottles per CA site (tonnes/annum)	13.26 tpa/site
WCA - Average quantity of plastic bottles per bring site (tonnes/annum)	4.72 tpa/site
Unitary - Average quantity of plastic bottles per bring/CA site (tonnes/annum)	4.62 tpa/site
Average quantity of plastic bottles per household (kg/annum)	**1.50 kg/hh/a**
WDA - Average quantity of plastic bottles per household (CA sites only) (kg/annum)	0.52 kg/hh/a
WCA - Average quantity of plastic bottles per household (bring sites only) (kg/annum)	1.67 kg/hh/a
Unitary - Average quantity of plastic bottles per household (bring/CA sites) (kg/annum)	1.28 kg/hh/a
Average quantity of plastic bottles collected per household from kerbside (kg/annum)	**7.52 kg/hh/a**
SCOTLAND (datasets: kerbside: 13 (59%) responses, bring: 13 (48%) responses)	
Estimated tonnage collected during 2006	**5,722 tonnes**
Estimated tonnage collected through bring during 2006	1,254 tonnes
Estimated tonnage collected through kerbside during 2006	4,468 tonnes
Average quantity of plastic bottles per bring site (tonnes/annum)	**0.94 tpa/site**
Average quantity of plastic bottles per household (kg/annum)	**0.94 kg/hh/a**
Average quantity of plastic bottles collected per household from kerbside (kg/annum)	**5.34 kg/hh/a**
WALES (datasets: kerbside: 9 (60%) responses, bring: 7 (47%) responses)	
Estimated tonnage collected during 2006	**5,807 tonnes**
Estimated tonnage collected through bring during 2006	1,313 tonnes
Estimated tonnage collected through kerbside during 2006	4,494 tonnes
Average quantity of plastic bottles per bring site (tonnes/annum)	**8.57 tpa/site**
Average quantity of plastic bottles per household (kg/annum)	**2.59 kg/hh/a**
Average quantity of plastic bottles collected per household from kerbside (kg/annum)	**8.71 kg/hh/a**
NORTHERN IRELAND (datasets: kerbside: 11 (44%) responses, bring: 12 (57%) responses)	
Estimated tonnage collected during 2006	**6,400 tonnes**
Estimated tonnage collected through bring during 2006	593 tonnes
Estimated tonnage collected through kerbside during 2006	5,807 tonnes
Average quantity of plastic bottles per bring site (tonnes/annum)	**2.90 tpa/site**
Average quantity of plastic bottles per household (kg/annum)	**0.98 kg/hh/a**
Average quantity of plastic bottles collected per household from kerbside (kg/annum)	**10.44 kg/hh/a**

NB. The findings for Scotland, Wales and Northern Ireland are based on comparatively small datasets and are thus likely to provide a less robust reflection of the actual tonnage collected. In addition, it should be noted that some local authorities operate both bring and kerbside collections.

4 Plastic bottle recycling schemes

Of the UK's 471 local authorities, 92% now offer recyclables collection facilities for plastic bottles, with 434 local authority recycling managers confirming plastic bottle collection facilities within their council area (Figure 2); although 11 of these were District authorities with County operated household waste recycling centres (HWRC). This reveals a 7.7% increase in scheme numbers with a net increase of 31 schemes since the end of 2005. This therefore means that only 8% of UK local authorities do not currently offer a recyclables collection service to their charge-payers that includes plastic bottles.

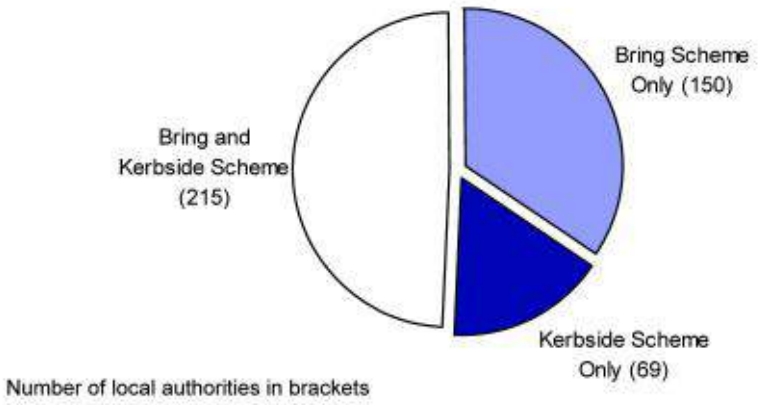
Figure 2: Number of UK local authorities that provide a plastic bottle recycling service



The two main approaches to the collection of plastic bottles in the UK are bring banks and kerbside collections. Bring schemes (plastic bottle banks) are available in 365 (77%) local authority areas. There are now 6,333 sites where plastic bottles are collected. Kerbside collections including plastic bottles now occur in 284 (60% - 65% if not including WDAs) local authority areas. A total of 13.9 million households (54%) can have their recyclables, including plastic bottles, collected from the kerbside.

In many cases, a combination of bring and kerbside collections are provided within a single local authority area to address local circumstances (Figure 3). 215 (50%) local authorities operate both bring and kerbside schemes within their council boundaries.

Figure 3: Type of plastic bottle recycling scheme



Bring and kerbside scheme performance is reported in more detail later within this report.

5 Collection infrastructure

Collection infrastructure for plastic bottles has continued to grow in the UK since last year's survey. Tables 2 and 3 show the current plastic bottle recycling activity by country.

England has 302 bring schemes and 222 kerbside schemes that include plastic bottles. These are spread across 360 local authority areas with 164 of those areas operating both bring and kerbside collections. Overall these schemes cover 92% of all English local authorities. The number of bring sites has increased from 4,158 in 2005 to 4,395 and the percentage of households covered by kerbside has increased from 47% to 54%.

Wales has 19 local authorities with plastic bottle collection facilities; including 15 bring schemes and 15 kerbside schemes, with 11 of those areas operating both types of scheme. This equates to 86% of Welsh local authorities. The number of bring sites has increased from 165 in 2005 to 215 and the percentage of households covered by kerbside has increased substantially, from 37% to 57%.

Scotland has 91% of their local authorities collecting plastic bottles for recycling through 27 bring schemes and 22 kerbside schemes. Twenty local authorities operate both types of scheme. The number of bring sites has increased from 801 in 2005 to 1,571, giving Scotland the highest average bring site density and the percentage of households covered by kerbside has increased from 35% to 41%.

Northern Ireland plastic bottle recycling comprises of 21 bring schemes and 25 kerbside schemes, with 21 local authorities operating both types of scheme. The number of bring sites declared and the percentage of households covered by kerbside have remained almost unchanged since last year's survey.

Table 3: Plastic bottle recycling activity by country

Country	Total No. Councils	Councils with plastic bottle collections	%	No. Councils with bring & kerbside plastic bottle collections	%	No. Councils with bring plastic bottle collection only	%	No. Councils with kerbside plastic bottle collection only	%
England	391	360	92	164	42	138	35	58	15
Wales	22	19	86	11	50	4	18	4	18
Scotland	32	29	91	20	63	7	22	2	6
Northern Ireland	26	25	96	21	81	0	0	4	15
Total	471	433		215		150		68	

Table 4: Plastic bottle recycling infrastructure by country

Country	Plastic bottle bring sites	Average household per available site	Total number of households offered kerbside collection including plastic bottles	% of all households
England	4,395	4,950	11,663,677	54
Wales	215	10,508	727,896	57
Scotland	1,571	407	931,628	41
Northern Ireland	152	8,475	583,388	91

6 Bring collection schemes

There are now 365 separate UK local authority areas with plastic bottle bring sites, with 6,333 sites in total. This represents a 20% increase in the number of sites available since 2005.

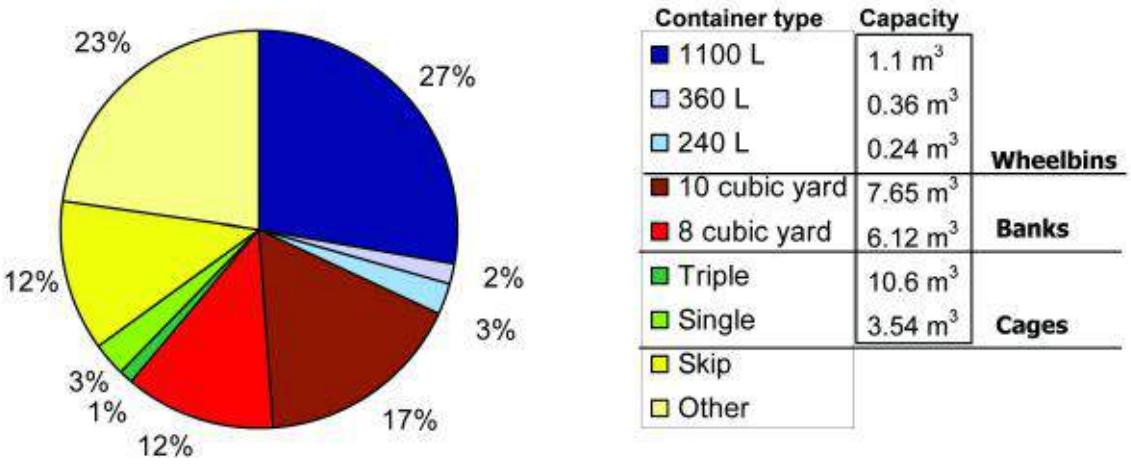
6.1 Container type

There are a range of different container types used in plastic bottle bring schemes. They have generally been added as a separate bank to existing bring sites for other materials, although in some cases, plastic bottles are collected with cans and subsequently sorted at a central facility.

Figure 4 shows the main bank type used by the individual bring schemes. In surveys previous to 2006 this chart has been based on the number of each bank type in use, but basing it on the main type of bank used by each scheme gives a better indication of scheme type. Generally local authorities will use the type and size of bank most appropriate to the size of the sites and frequency of use by members of the public. For example skips and other large containers are more likely to be used at large sites, such as Civic Amenity/Household Waste Recycling Centres, whereas smaller banks such as the 1100 litre wheeled bins are more appropriate for use where there are a larger number of small sites.

23% of local authorities that responded stated that they used "other" bank types. There are a wide variety of containers available for use in bring schemes, although the ones listed in Figure 4 are the most common types. Some local authorities that have stated they use "other" bank types may in actual fact use a range of different banks as appropriate to each site. This is particularly the case with Unitary authorities that operate both large sites for household waste and a number of smaller bring sites.

Figure 4: Proportion of local authorities that use each container type as the main container for collection



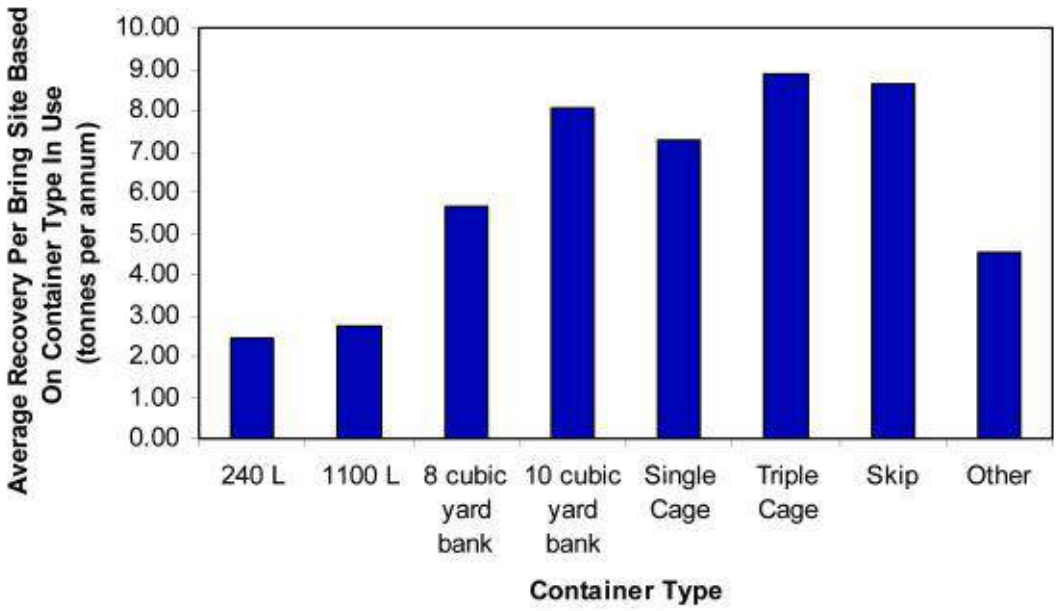
Bring schemes are calculated to have produced some 25,000 tonnes per annum of recyclable plastic bottles in 2006. This is a 29% increase since 2005, when some 20,000 tonnes of plastic bottles was reported as generated.

The average annual recovery per site has increased from 3.7 tonnes of plastic bottles in 2005 to 4.4 tonnes for 2006. Individual site performance will vary quite widely depending on the number and type of sites, and the catchments population. For example large household waste recycling centres operated by WDA's generate on average 13 tonnes per site per annum compared to the smaller more numerous sites operated by WCA's and unitary authorities, which generate on average 4.7 and 3.3 tonnes per site per annum respectively.

Some large household waste recycling centres can generate over 30 tonnes or more of plastic bottles per annum if there are no other plastics recycling facilities in the area.

As can be seen (Figure 5) sites that generate high quantities of plastic bottles per annum tend to use larger banks, with greater storage capacity.

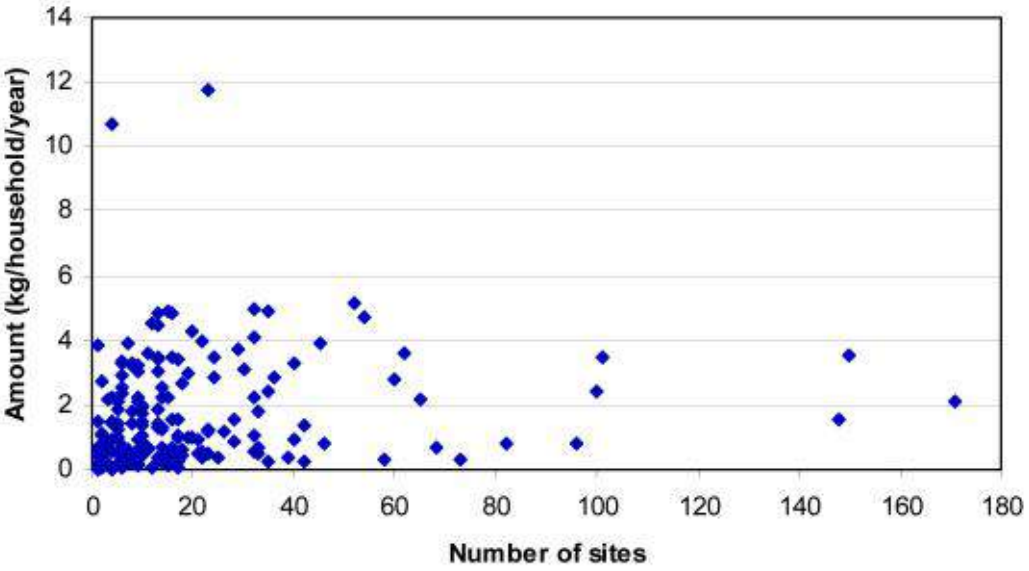
Figure 5: Bring scheme recovery performance by container type



6.2 Scheme performance

The number of sites has been plotted against recovery per household for more than 195 bring scheme datasets (Figure 6) to demonstrate the variation in performance. As can be seen 73% of local authorities operate fewer than 20 bring sites and 69% recover less than 2kg per household per annum. However there are an increasing number of schemes (60 according to the survey data) that are collecting 2kg to 5kg plus per household per annum.

Figure 6: Bring scheme performance analysis



The lack of a significant correlation between the number of sites and the quantity of plastic bottles collected suggests that other factors such as type of site, local demographics and promotion also affect recovery rates.

Anecdotal reports from local authorities indicate that bring sites for plastic bottles remain very popular with members of the public. However, there are some recurring issues that local authorities commonly face when collecting plastic bottles through bring sites.

Due to the high volume, lightweight nature of plastic bottles they fill collection banks comparatively rapidly. If the banks provided have insufficient capacity to hold the bottles, or there is insufficient servicing the banks will overflow and littering will occur. This, together with contamination by other plastics is the most common issue faced by local authorities that operate bring schemes for plastic bottles. It is therefore important that container capacity and servicing frequencies are planned according to the quantity of plastic bottles expected to be generated at any given site.

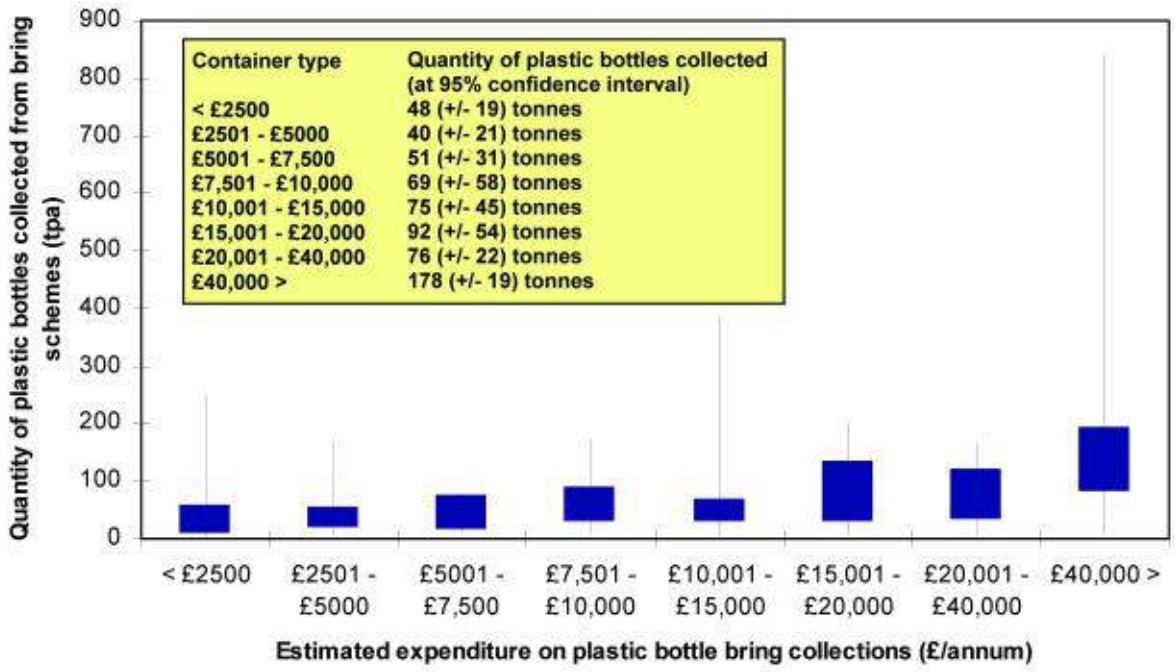
As mentioned, contamination with plastic items other than bottles is common. Members of the public often assume that all plastics can be recycled, so yoghurt pots, food trays and so forth are frequently deposited in banks meant only for plastic bottles. Some local authorities collect mixed household plastic for recycling, but markets for the material are currently limited and the material is generally exported. This is discussed in more detail later in this report.

In order to help prevent contamination with unwanted plastic items it is important that banks are clearly labelled and have apertures of an appropriate size and shape to encourage only plastic bottles to be deposited.

6.4 Expenditure

Local authority recycling managers were asked to indicate their current annual expenditure on plastic bottle recycling through their bring schemes, choosing from a series of cost bands. 165 (45% of those with bring schemes) provided a response to this question (a further 80 (22%) responded cost was unknown), with 131 also providing tonnage data, used to analyse the relationship between declared cost and tonnage collected. The data was analysed to identify average performance with 95% confidence interval for each dataset[3] (Figure 7). These are represented in "Box and Whisker" plots. The extremes of the lines represent the maximum and minimum performances from any individual scheme. The upper and lower limits of the box show the range, which represents the individual scheme performances that fall between the 25% and 75% quartiles.

Figure 7: Associated plastic bottle recycling scheme costs



In a majority of cases the reported costs for bring scheme systems were between £50 and £350 per tonne of bottles recycled. This is consistent with previous surveys and case studies (www.recoup.org) that suggest average direct costs of £150 - £250 per tonne would be typical. Issues such as locality, household density, contractor availability, collection method and material market value will all influence the overall cost per tonne of plastic bottle recycling. This data suggests that where bring schemes are incurring direct costs above £300 per tonne there may be inefficiencies in the system that could be beneficially resolved.

[3]i.e. There is a 95% probability that the average will fall within the confidence range

7 Kerbside collection schemes

There are now 284 kerbside schemes including plastic bottles in the UK, representing 13.9 million households. The coverage of households has seen a 21% increase since the end of 2005 and is equivalent to approximately half (54%) of all UK households now having the opportunity to include plastic bottles in their local kerbside collection programme.

Participation in these schemes is essentially voluntary, so not all households within a scheme will participate. The reported participation for schemes is between 24 - 100 % (an average of 68%). It is calculated that the average capture rate of plastic bottles through current kerbside collection programmes is 36%[4]. This is an improvement on previous years (the 2006 survey showed a 32% average capture rate), but still indicates the potential to achieve much greater levels of collection from current kerbside infrastructure.

Understanding the mechanisms that influence kerbside systems is fundamental if effective practice is to be identified. This is especially crucial for plastic bottle recycling, with a number of variables influencing a scheme's economic efficiency and recovery performance.

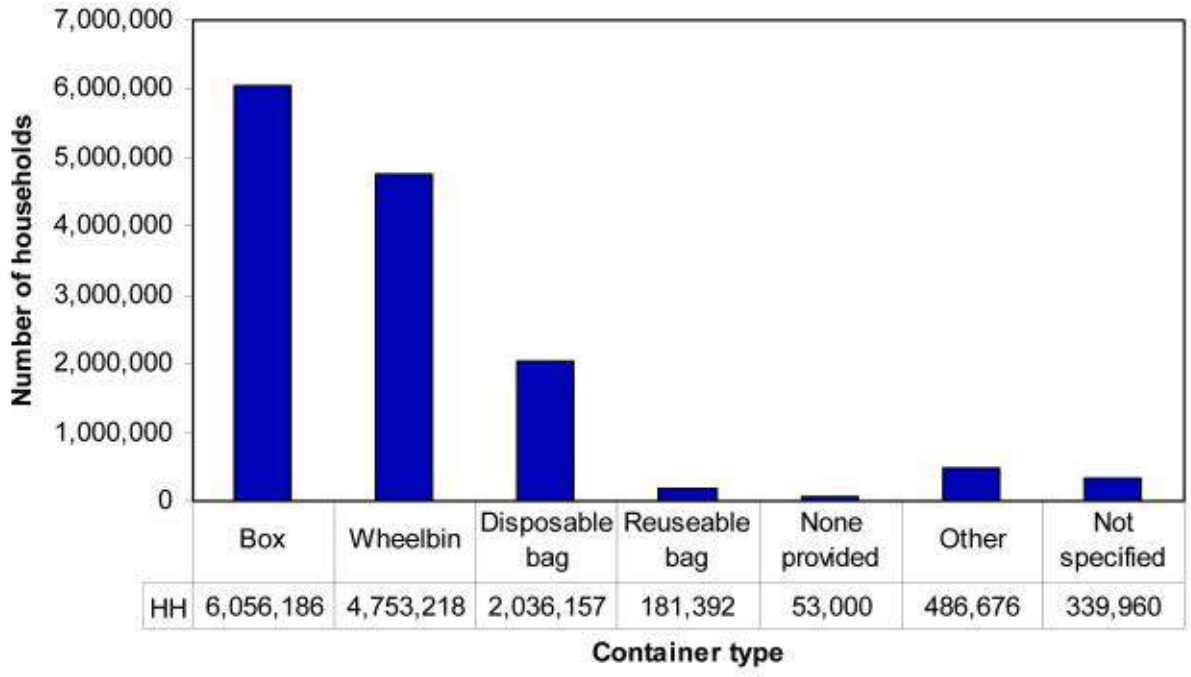
As in previous surveys, each variable has been isolated to assess its prevalence and influence on plastic bottle recovery; thus enabling the analysis of the range of opportunities for the recycling of plastic bottles from the kerbside. Each local authority will have unique features within their kerbside scheme, yet common elements such as frequency of collection, relation to residual refuse collection and container type can be compared and analysed.

Statistical analysis of the data has been undertaken to establish 95% confidence intervals for quoted average performance data, which provides useful predictive data for many types of scheme.

7.1 Container type

As can be seen (Figure 8), boxes and wheelbins are the most popular container type used for the collection of dry recyclables. The box has historically been the container of choice for kerbside collections and remains very popular, however the number of households being provided with wheelbins for the collection of their dry recyclables is also on the increase.

Figure 8: Containers used for kerbside schemes including plastic bottles



[4]This capture rate refers to all households which currently have access to plastic bottle recycling facilities, although not all of these households participate in recycling.

Although many local authorities have stated that they use a box, in reality many of them use two boxes and/or a reusable/disposable bag. This is particularly true for local authorities that sort dry recyclables at the kerbside, or use separate vehicles to collect different materials. Many of those that reported that "other" containers are used actually use a combination of containers. This can be to provide additional capacity, or to enable the householder to separate different dry recyclables (for example a scheme might collect glass bottles in a box and mixed cans and plastic bottles in a bag).

Boxes typically have a 55 litre capacity and wheelbins generally have either a 120 or 240 litre capacity. It is common practice to use different coloured containers to distinguish which materials the householder should place in each receptacle.

Wheelbins have proved popular with recycling managers due to their additional capacity and servicing benefits where on-vehicle sorting is not required (i.e. no manual lifting required to empty). The additional capacity provided by the wheelbin is of particular importance when high volume items, such as plastic bottles, are included in a dry recyclables collection.

The third major container option in use is the bag. These can either be supplied to the householder, or the householder can be encouraged to use carrier bags. Approximately 2.2 million householders have a separate collection of dry recyclables including plastic bottles through this option; although as stated previously, bags are often used in conjunction with a box to provide sufficient storage capacity for householders, so the actual number of householders using bags for dry recyclables is probably far greater than this.

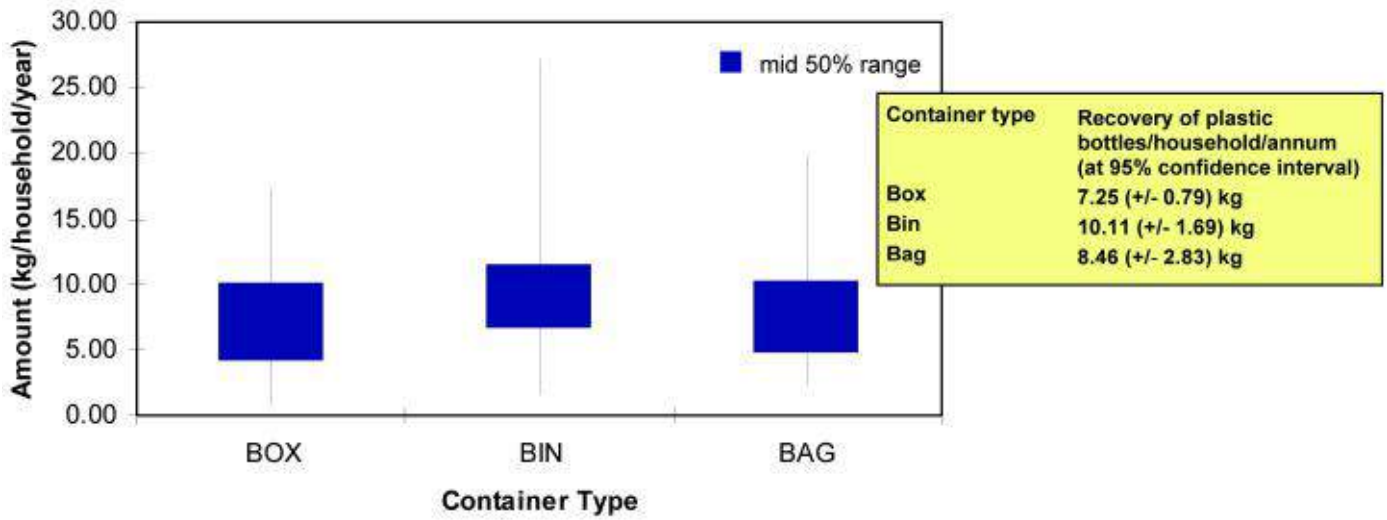
As with boxes and wheelbins, different coloured bags can be provided for different materials. Clear or tinted bags are frequently used as this assists with quality control at the kerbside, enabling collection crews to identify heavily contaminated bags. Perforated bags are sometimes used, as they can be opened more quickly and efficiently. Kerbside collection bags can be separately baled and sold for recycling following use.

Survey data indicates that kerbside schemes are achieving an average recovery of 7.5 kg of plastic bottles per household per annum. This is an increase of 2kg from the previous survey. There are variations in scheme performance for each container type, but wheelbins are shown to have a higher average recovery rate (Figure 9).

The highest performing kerbside schemes reported achieving in excess of 20 kg per household per annum of plastic bottles from households covered. The lowest performing kerbside schemes generated less than 2 kg per household per annum.

The data was analysed to identify average performance with 95% confidence interval for each dataset[5] (Figure 9). These are represented in "Box and Whisker" plots. The extremes of the lines represent the maximum and minimum performances from any individual scheme. The upper and lower limits of the box show the range, which represents the individual scheme performances that fall between the 25% and 75% quartiles.

Figure 9: Kerbside plastic bottle recovery performance by container type



[5]i.e. There is a 95% probability that the average will fall within the confidence range

It should be noted that while wheelbins are shown to achieve a higher recovery rate there are other influences on recovery, such as the quantity of other materials collected, promotion and frequency of service. It seems reasonable to expect that the higher capacity of wheelbins will facilitate improved overall recycling rates, compared to single box systems, as single box systems limit the quantity of recyclables that a household can store. As already stated though, many box schemes use more than one box and/or a bag for the collection of recyclables.

7.2 Frequency of collection

The frequency with which the container is collected is a major factor in recycling schemes. This also has a controlling influence on the type of container, as capacity becomes an issue. Weekly or fortnightly collections are the most common, although some collections are every four weeks, or on a set day each month. An increasing number of local authorities are also moving to alternate weekly collections, where residual waste is collected in week 1 and dry recyclables and/or compostables are collected in week 2. According to survey results 108 local authorities in the UK are currently operating alternate weekly collections that include plastics and more are in the process of changing to this method of collection.

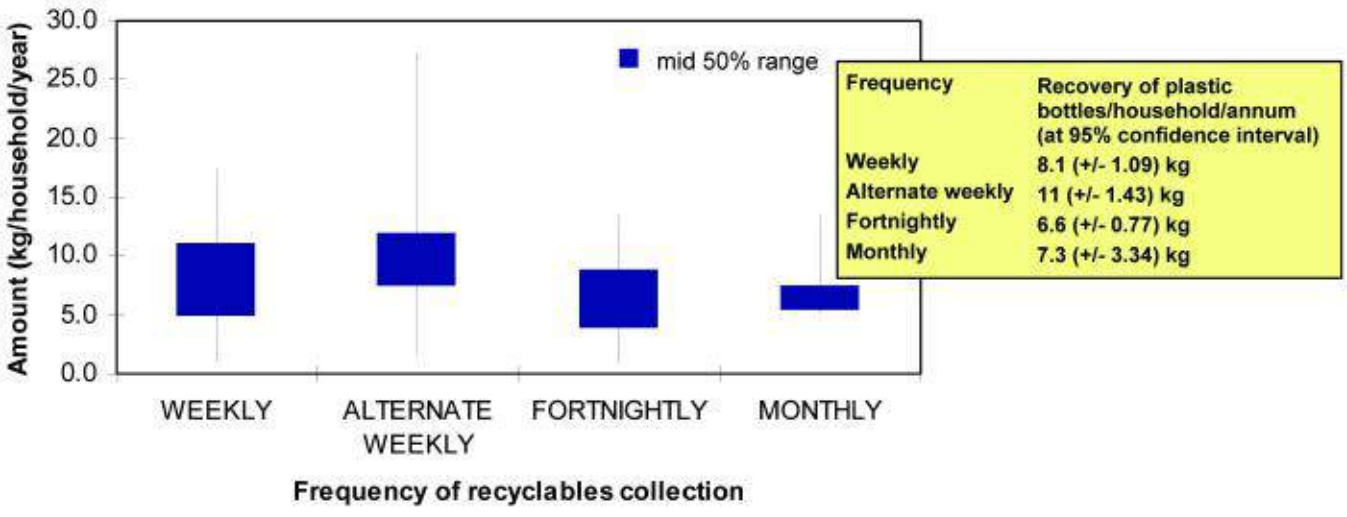
A fortnightly collection service of recyclables is particularly popular (Table 5), as it reduces servicing costs per household compared to weekly collections. Alternate weekly collections are shown to be the highest performing, followed by weekly collections. Fortnightly collections are shown to perform less well. The dataset for monthly collections was comparatively small, so it is difficult to take a view on performance, although in previous surveys[6] monthly collections have been shown to perform less well than weekly and fortnightly collections (Figure 10).

Table 5: Frequency of kerbside collection

	Box	Wheelbin	Bag	None	Other	Not specified	TOTAL
Weekly	2,319,487	0	1,130,730	0	134,768	0	3,584,984
Alternate weekly	894,415	2,843,310	273,541	53,000	79,010	0	4,143,276
Fortnightly	2,598,664	1,240,467	662,328	0	70,000	94,807	4,666,266
Monthly	0	465,842	0	0	0	0	465,842
Other	174,620	142,600	92,000	0	197,164	0	606,384
Not specified	69,000	61,00	58,950	0	5,734	245,153	439,837
TOTAL	6,056,186	4,753,218	2,217,549	53,000	486,676	339,960	13,906,589

Monthly collections are least popular and as can be seen (Table 5) wheelbins tend to be required if collections are undertaken monthly to ensure that sufficient capacity is available to store the dry recyclables.

Figure 10: Kerbside bottle recovery performance by frequency of collection



The container capacity has an obvious relationship with collection frequency. Table 5 shows that a greater proportion of box schemes operate a weekly or fortnightly collection, while wheelbins tend to have a collection frequency of fortnightly or lower, due to large capacity. Like box collections, a majority of schemes using bags are serviced weekly or fortnightly, however the versatility of bags allows them to be collected at less frequent intervals, as there is no issue

[6]Previous surveys are available for download from the WRAP (www.wrap.org.uk) and Recoup (www.recoup.org) websites

with limited capacity providing householders can easily restock their supply of 'recycling bags' and find a space to store them once full.

7.3 Relationship to refuse collection

The majority of local authorities operate recyclables collections on the same day as the residual refuse collection, using a separate vehicle (Figure 11). The reasoning behind this is that it is easier for householders to remember one collection day for everything, than to remember a separate collection day for dry recyclables in addition to the collection day for residual refuse. However alternate weekly collections are becoming more popular, with the number of households on alternate weekly collection that include plastic bottles having increased by 1,362,411 households (increase of 46%) since last year to 4.3 million.

Data from the survey shows that alternate weekly collections achieve a higher performance than collections that are not integrated with the residual refuse collection (Figure 12). Some local authorities have reported that alternate weekly collections maximise the efficient use of resources and minimise service costs of refuse and recycling operations.

Figure 11: Dry recyclables kerbside scheme relationship to residual refuse collection

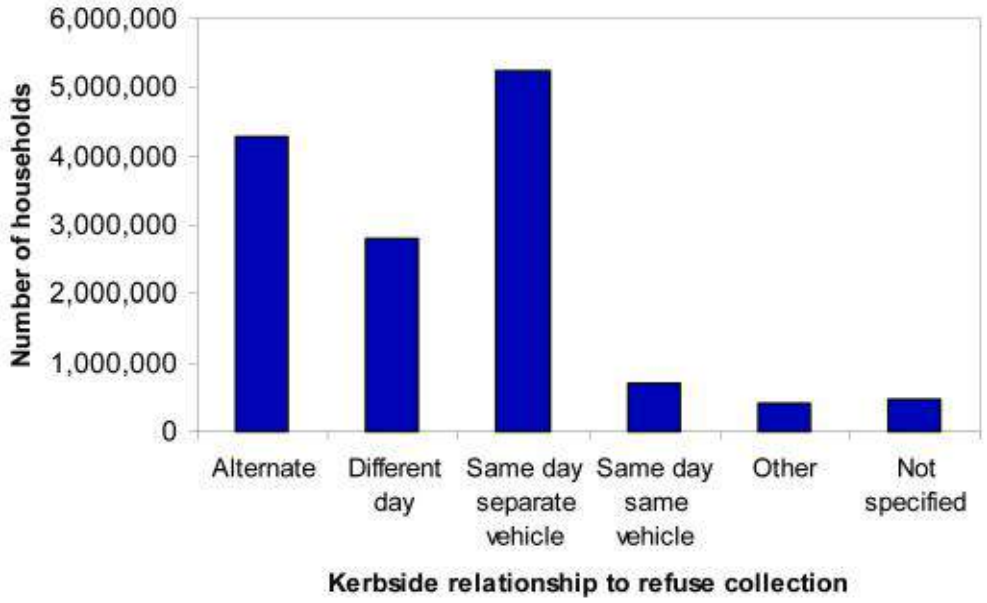
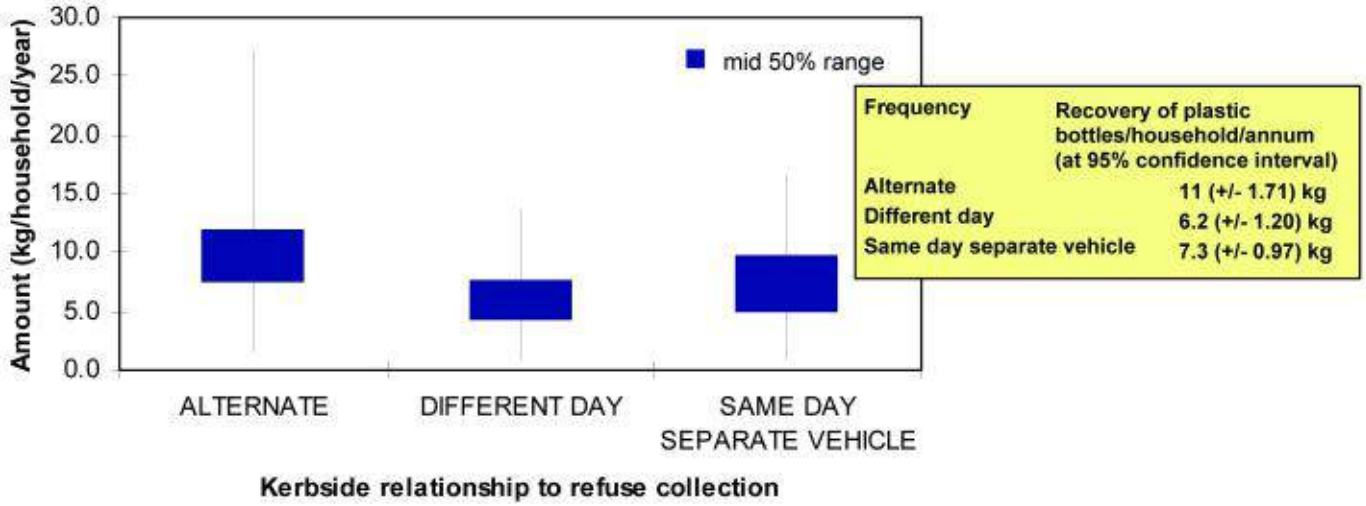


Figure 12: Kerbside bottle recovery performance by relationship to refuse collection



NB. Data for same day same vehicle is not shown in Figure 12 due to the very small data set.

7.4 Expenditure

It can prove difficult for local authorities to separate out the cost of plastic bottle recycling through kerbside collections, as these are typically collected alongside other materials. Recycling managers were therefore asked for their views on including plastic bottles in recyclables collections and the value of doing so. These issues are discussed in the next section of this report, which addresses perceptions of plastic bottle recycling.

8 Perceptions of plastic bottle recycling

Local authority perceptions of plastic bottle recycling are helpful to establish the value of recycling plastic bottles and barriers to implementation. This information is useful for local authorities considering the introduction of a plastic bottle collection. It is also useful to organisations wishing to encourage plastic bottle recycling, helping to identify key messages and areas where action may be required.

8.1 Value of plastic bottle recycling

Local authority recycling managers that operate a plastic bottle recycling scheme were asked 'Overall, how would you rate the value of your current plastic bottle collection scheme?' They were requested to select just one of the listed options. Figures 13 and 14 show the results for WDA's and WCA's/Unitary authorities; 23 and 286 responses were received respectively.

Figure 13: Value of plastic bottle recycling (WDA)

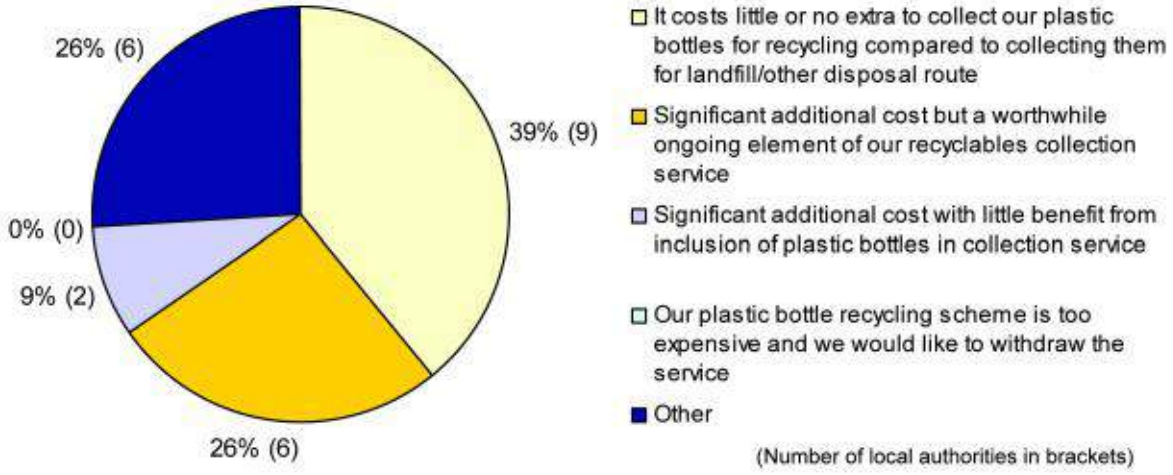
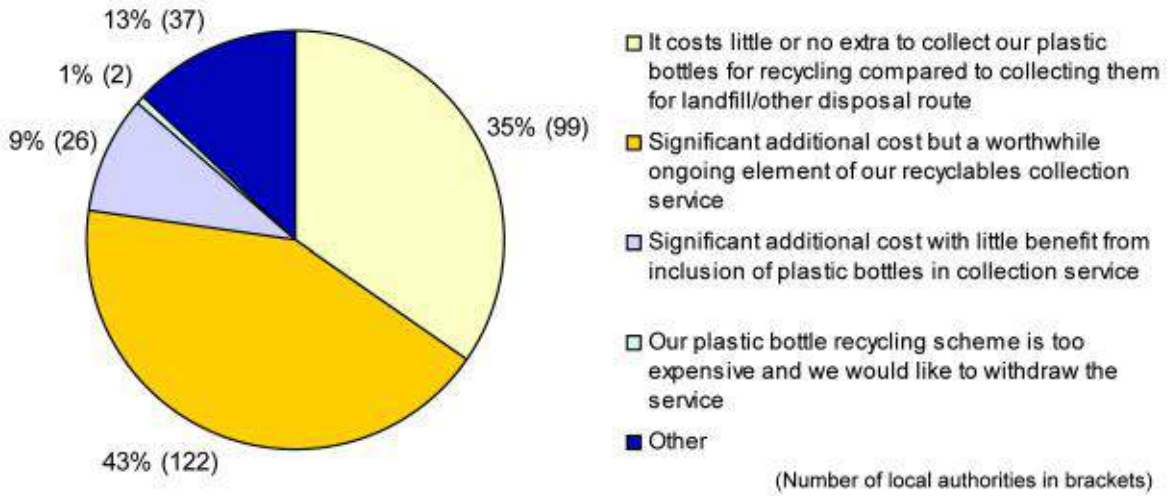


Figure 14: Value of plastic bottle recycling (WCA/Unitary)



Responses from WDA's refer to collections through CA/Household Waste Recycling Centres, whereas responses from WCA's/Unitary authorities refer to both bring and kerbside collections.

The responses were very positive, with 39% of WDA's and 35% of WCA's/Unitary authorities indicating that it costs little or no extra to collect plastic bottles for recycling compared to collecting them for landfill/other disposal route. This reinforces evidence that plastic bottle recycling can be achieved cost effectively.

A further 26% and 43% of WDA's and WCA's/Unitary authorities respectively indicated that, while they collected plastics at a significant additional cost, it was a worthwhile ongoing element of their recyclables collection service. Only two WDAs and 26 (9%) WCA's/Unitary authorities indicated there was little additional benefit from the inclusion of plastic bottles and only two local authorities stated that they wished to withdraw the service.

8.2 Factors that prevent a plastic bottle collection scheme being established

Recycling managers not currently operating a plastic bottle recycling scheme were asked to rank the three most important factors for this, from the following options:

- Existing waste/recyclables collection contract is inflexible, making it difficult to add plastic bottles
- No suitable local baling/handling facility (e.g. MRF)
- Have costed scheme and it is too expensive
- Difficult to add plastics due to use of kerbside sort vehicles - not enough compartments available
- Not confident in market outlets for collected plastic bottles
- There is little political interest in plastic recycling within council
- Currently focussing on heavier materials to hit recycling targets
- Lack of available skills and/or time to plan/implement scheme
- Other

112 responses were received and the results are shown in (Figure 15).

The three most important reasons given for not recycling plastic bottles were, in order of priority:

- Difficult to add plastics due to use of kerbside sort vehicles – not enough compartments available (35%)
- Have costed a scheme and it is too expensive (28%)
- Currently focussing on heavier materials to hit recycling targets (17%)

Responses from the 2006 survey (which relate to 2005 data):

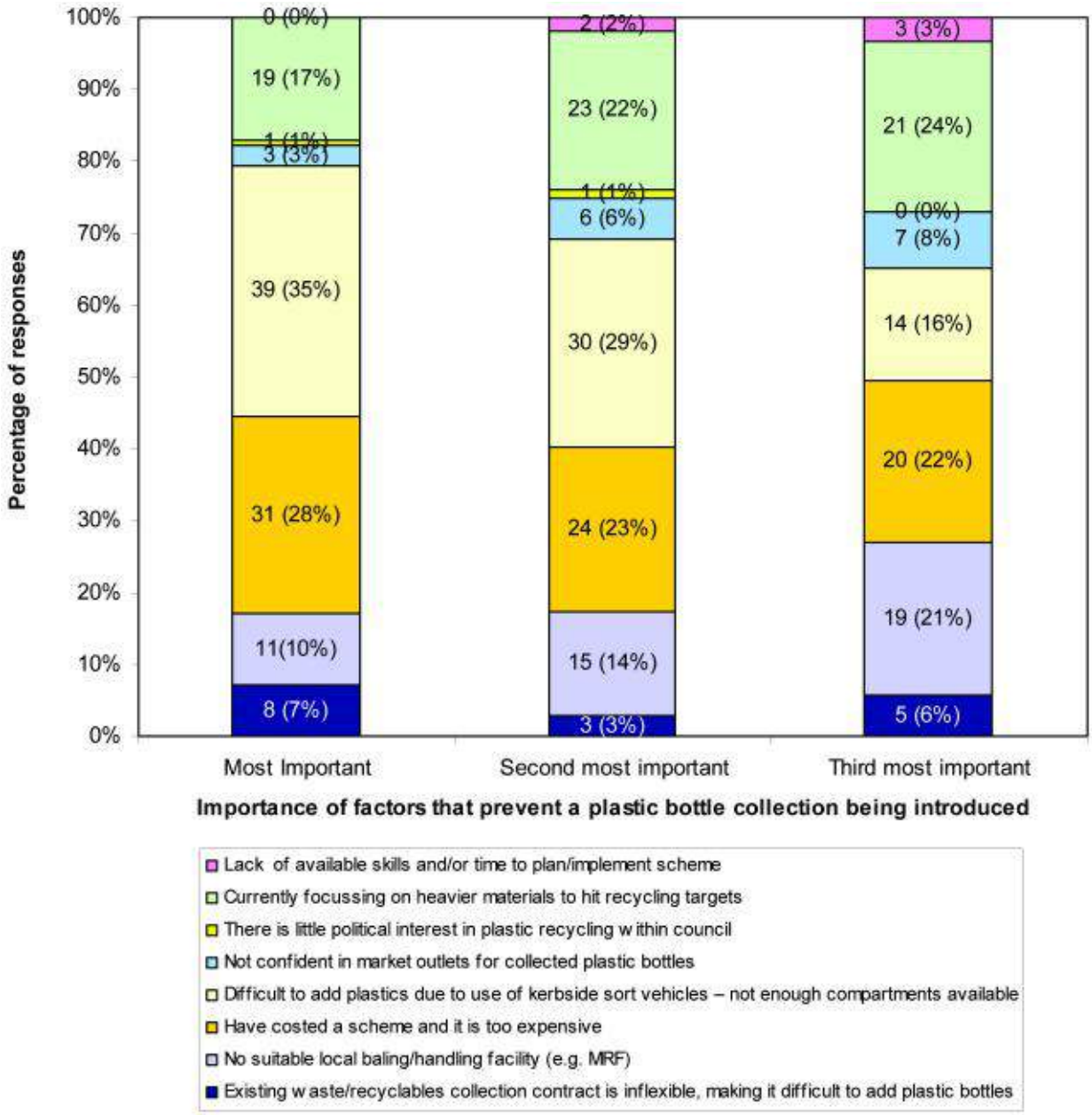
- Focussing on heavier materials to hit weight based recycling targets (35%)
- Cost: A scheme has been costed and viewed as too expensive (22%)
- Difficult to add plastics due to use of kerbside sort vehicles - not enough compartments available (16%)

Material weight, cost of collection and lack of vehicle capacity are the main recurring reasons given by local authorities for not collecting plastic bottles for recycling.

The following can be concluded:

- Consideration of the implications of adding plastic bottles to selected collection and handling infrastructure at a later date is important to ensure future collections can be implemented efficiently. This is particularly the case where sort at kerbside vehicles are used. There are however options that managers of sort at kerbside schemes can consider to enable the inclusion of plastic bottles, including changing vehicles, collecting cans and bottles together, or introducing a separate collection for plastics using compaction vehicles. Changing the existing vehicle fleet isn't always viable however if new vehicles have recently been purchased, or contractual arrangements are in place preventing this.
- Some local authorities still view plastics as too expensive to include in kerbside recycling collections. This may be related to the type of scheme already in operation, or to area specific issues, which may restrict the type of collections/collection vehicles that can be operated.
- In the past weight based recycling targets have restricted the expansion of plastic bottles and potentially other lightweight high volume items from being recycled. These valuable items therefore continued to take up landfill space, which is decreasing in availability. This remains an issue, but as targets are increasing local authorities are expanding the range of materials being collected and reassessing their overall waste management and recycling operations.
- The responses also imply that existing baling/handling infrastructure in the UK may require further assessment and potential expansion.

Figure 15: Factors that prevent a plastic bottle kerbside collection scheme being introduced



9 Planned developments

The potential growth of the UK plastic bottle recycling infrastructure can be assessed through feedback from recycling managers. The reported planned developments can be used to analyse growth within both bring and kerbside systems (Figures 16 & 17). The continual year on year growth of plastic recycling schemes is strengthened by the availability of increased Government funding for recycling, improved technologies and statutory or national targets.

There are currently 13.9 million households receiving a kerbside collection of recyclables in the UK. This is a 21% increase since the end of 2005 and represents 54% of UK households. The provision of bottle recycling within kerbside collections is set to exceed 14.6 million households during 2008. This will represent 56% of UK households.

Figure 16: UK kerbside scheme coverage over time including planned growth

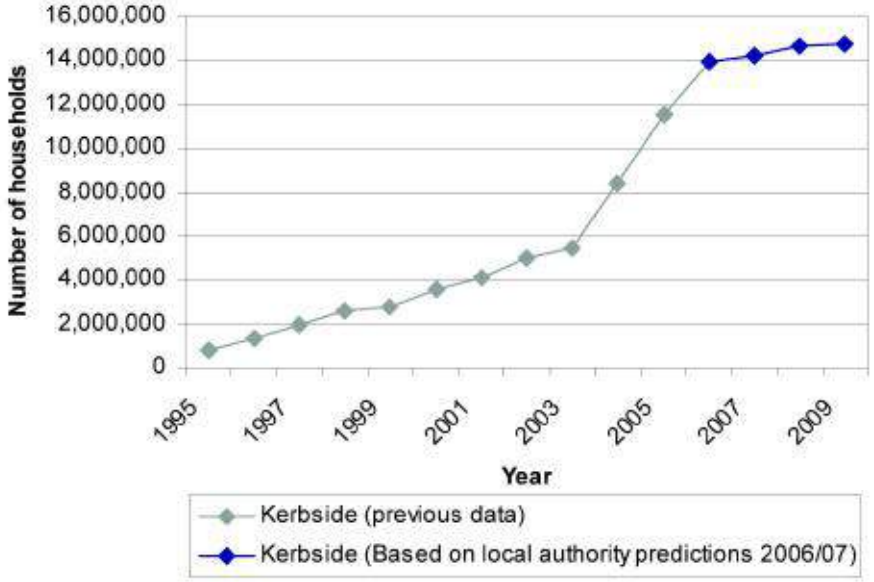
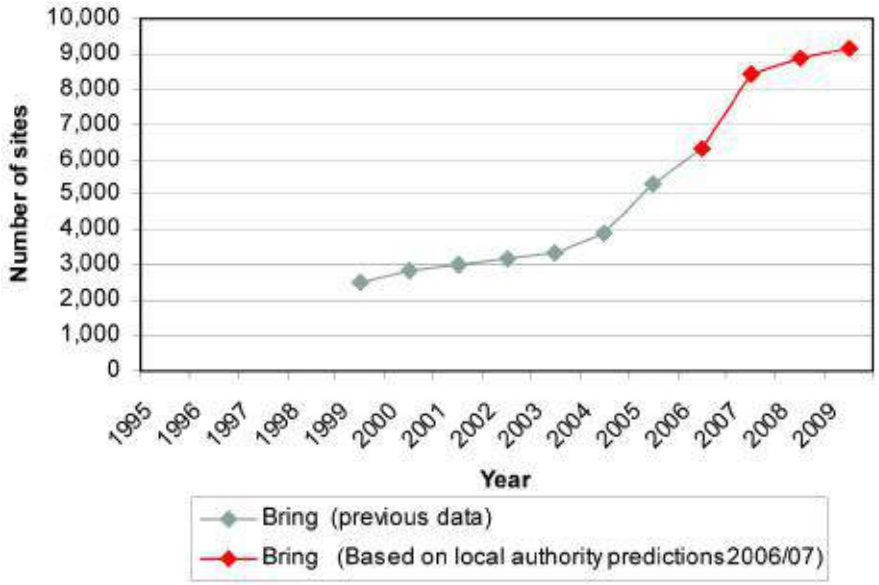


Figure 17: UK bring scheme coverage over time including planned growth



It is anticipated that actual plastic bottle recycling activity will be greater than the reported projections[7].

The number of bring sites has also risen to 6,333 sites across the UK, a 20% increase since the end of 2005. The plans again suggest a continued rise in bring facilities over the next year as new sites and schemes are developed, with a total of approximately 8,864 sites expected to be operational by the end of 2008.

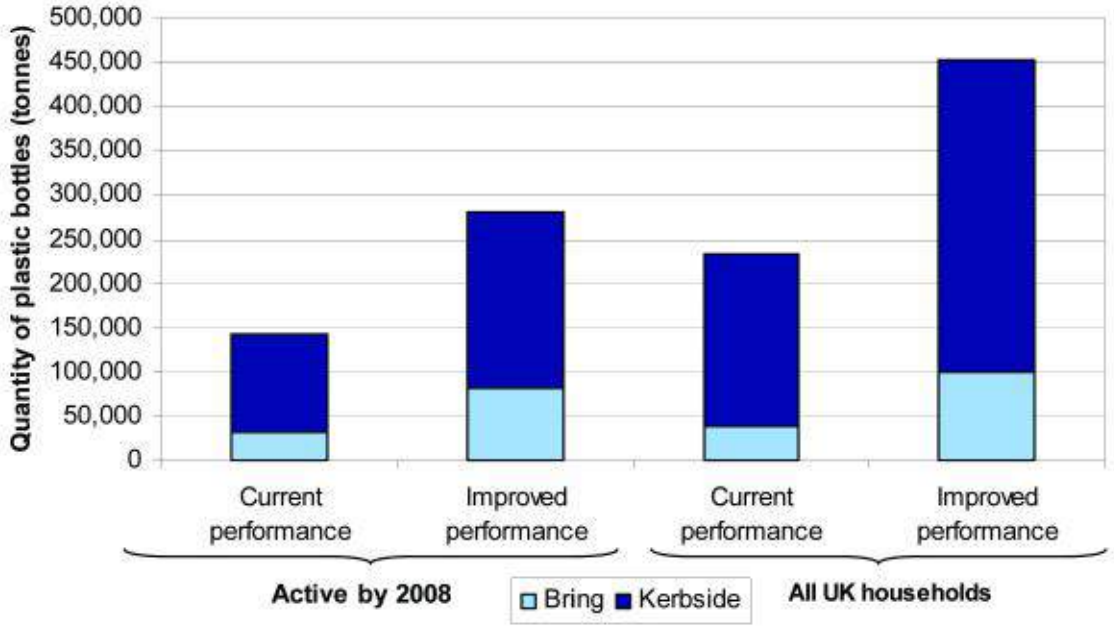
Local authorities have indicated that both kerbside and bring system infrastructure will be improved during 2007, and this is reflected in the enhanced tonnage recovery estimates (Figure 1).

[7]Scheme coverage and recovery level predictions for plastic bottles within the previous five WRAP and Recoup UK plastic bottle recycling surveys have typically out performed reported expectations by at least 5-10%.

10 The potential of plastic bottle recycling

It has already been identified that there are wide variations in performance of current collection schemes, and that there is the potential to significantly improve performance of the existing infrastructure. Figure 18 highlights the potential collection levels that could be realistically achieved by the adoption of bring and kerbside schemes across the UK, based on current and improved levels of performance. This highlights the importance of a comprehensive infrastructure for plastic bottle recycling and reinforces the advantage of extensive, well promoted kerbside collections in improving recycling and maximising recycling opportunities.

Figure 18: Potential scenarios for UK plastic bottle recycling



From Figure 18 it can be assumed that over 140,000 tonnes of plastic bottles will be collected through the current planned activities by the end of 2008. The majority of this material will be recovered through the kerbside systems.

If both schemes achieved good performance levels with bring activity recovering 3.8kg per household per annum, and kerbside collecting 13.5kg per household per annum, a total recovery of 280,000 tonnes of bottles may be achievable from the planned infrastructure. These increased performance levels are based on the 75% quartile from the bring and kerbside data sets respectively.

The performance level will also be dependant on greater communications and improved convenience for the householder. At this level of performance, planned activity could generate close to 50% recycling of plastic bottles in the UK household wastestream by the end of 2008.

11 Other household plastics

Not only is there great demand from members of the public for plastic bottle recycling facilities, but there is also a demand for facilities to recycle other household plastics such as carrier bags, packaging film, tubs and trays, plant pots, expanded polystyrene and so on.

Responding to this survey, 82 local authorities (17%) stated that they actively collect non-bottle plastics from households. Table 6 shows the number of these local authorities that collect each category of plastics. As can be seen they all collect plastic bottles, with food tubs & trays and carrier bags being the next most popular plastic items for collection.

Table 6: Number of local authorities that offer a recyclables collection for plastics other than bottles

	Items included in dry recyclables collection						
	Plastic bottles	**Food tubs and trays**	**Carrier Bags**	**Packaging films**	**Plant pots**	**EPS**	**Other dense plastics**
Bring	**21**	**19**	**16**	**6**	**3**	**1**	**6**
Kerbside	**26**	**22**	**13**	**8**	**6**	**0**	**2**
Bring & kerbside	**33**	**10**	**8**	**3**	**0**	**0**	**0**
Total	**80**	**51**	**37**	**17**	**9**	**1**	**8**

It is difficult at present to gain a clear idea of the quantity of non-bottle household plastics being collected for recycling, as many local authorities that collect this material do not have separate tonnage data for it. The following figures are based on a very small dataset and are also based on some schemes collecting film and carrier bags and some collecting pots and tubs. Realistically it could be expected that those schemes collecting pots and tubs, or other dense plastics, would generate higher tonnages than those collecting film and carrier bags.

Quantity of other household plastics collected for recycling (excluding plastic bottles)
(Based on small dataset, therefore may not be robust and actual figures may vary from those below.)

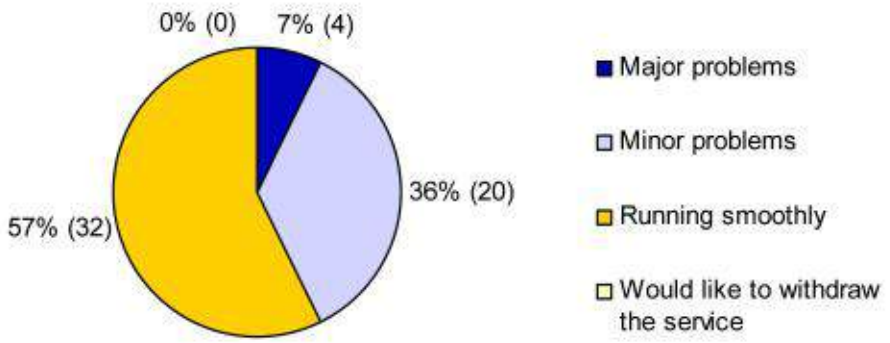
Bring sites (dataset: 15 local authorities)
Average quantity per bring site: 5.49 tpa

Average quantity per household: 2.61 kg/hh/a

Kerbside (dataset: 16 local authorities)
Average quantity per household: 6.52 kg/hh/a

Estimated quantity collected for recycling: 17,000 tpa

Figure 19: How well collection schemes for non-bottle plastics operate



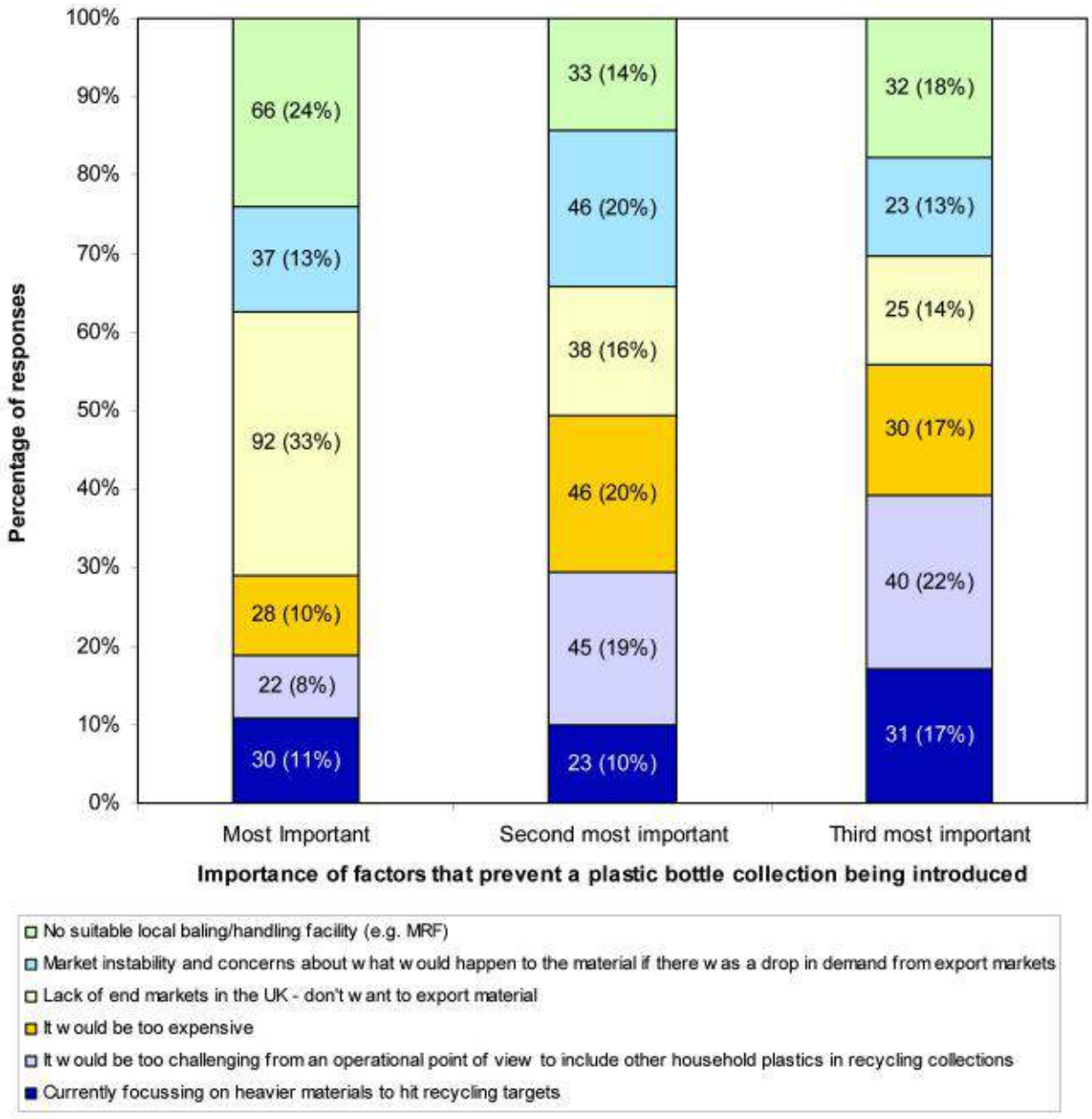
A majority of local authorities that stated they collect other household plastics for recycling indicated that they had few or no problems with the scheme (Figure 19). The main concerns related to operational and logistical aspects such as handling and transporting the large volumes of material. If this is the case, then it could be questioned why more local authorities aren't collecting other plastic items from households in addition to bottles. Local authorities not offering collection facilities for other household plastics were asked to rank the three most important factors for this, from the following options:

- Currently focussing on heavier materials to hit recycling targets
- It would be too challenging from an operational point of view to include other household plastics in recycling collections
- It would be too expensive
- Lack of end markets in the UK - don't want to export material
- Market instability and concerns about what would happen to the material if there was a drop in demand from export markets
- No suitable local baling/handling facility (e.g. MRF)
- Other

275 responses were received and the results are shown in Figure 20.

As can be seen there was a wide range of responses, although those seen as most important were a lack of UK markets for the material and that there was no suitable local baling/handling facility (e.g. MRF).

Figure 20: Factors that prevent a collection scheme being introduced for other household plastics



If there are no UK markets for mixed plastics, it can be assumed that mixed plastic packaging is exported for recycling. Markets for plastic bottles and other household plastics are discussed in the next section.

12 Markets

12.1 General information on the plastics market

As shown by the findings of this survey, the majority of plastic collected for recycling from the household wastestream is plastic bottles. While there are many polymer types, the majority of bottles are made from either PET or HDPE material. It is estimated that the ratio is 55-60% PET to 40-45% HDPE, but this will vary between collection schemes.

The market for plastic bottles is strong both for UK and export markets, but maximum market value can only be achieved if the bottles are prepared and baled to the correct specification. This allows for transportation to be as cost effective as possible and minimal sorting by the reprocessor. Mixed plastic bottle bales with low contamination can attract values of more than £100 per tonne in April 2007. If separated into relevant polymer or colour fractions even higher prices are achievable.

Approximately 70% of the plastic bottles collected in the UK are currently sold to export markets. This global demand is expected to continue, although the viability of Far Eastern markets will depend on continuing competitive shipment prices and low labour costs. The UK plastic bottle reprocessors are also requesting more plastic bottle material. A number of end market developments are also expected in the UK for recycled PET and HDPE, including possible food grade applications which will further increase demand for plastic bottles.

Plastic PRN values have suffered over recent years as a result of the success of plastics packaging recycling. Since autumn 2005, plastic packaging recovery note (PRN) values have steadily declined to an average of £5 to £6 per tonne in Q1 2007 reflecting higher actual recycling rates than the targets set and resulting in an excess of plastic PRNs at the end of the obligation year.

12.2 Plastic bottle market

There are various options for local authorities selling collected plastic bottles. This can involve a number of organisations including waste management companies, third party agents and the reprocessors themselves.

Of 198 respondents, 82 local authorities have contracts for plastic bottle material and 116 use spot markets which are generally reviewed at least twice yearly. While the spot market approach does not provide price stability, it does allow increased demand and market peaks to be accommodated.

Of 345 local authority respondents over half (53%) identified that the contractor received the revenue from plastic bottle sales. This is commonly linked to a set price for collection which takes the material value into account. A further 14% had a revenue sharing agreement and 20% received the revenue from material sales directly.

Figure 21 demonstrates that the contractor tends to decide where the plastic bottle material is sold, with only 17% of local authorities selling the bottles direct to market. This will be an economic led decision unless there are other drivers such as strong councillor or public demand to recycle in the UK where possible.

Figure 21: Responsibility for sourcing a market for collected plastic bottles

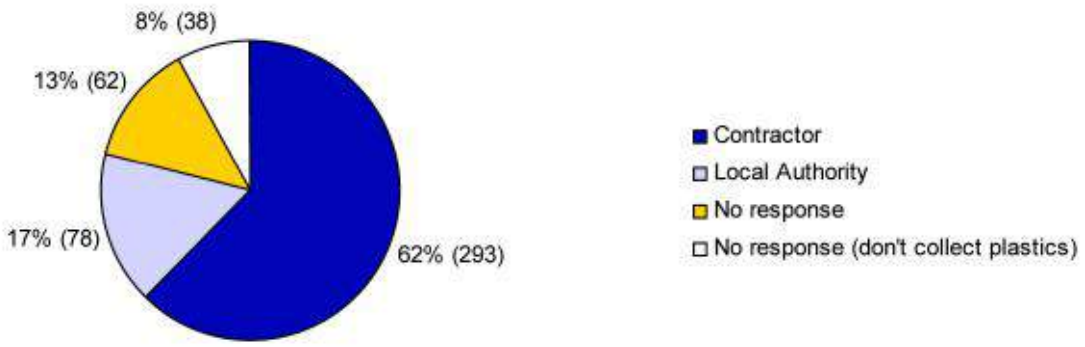


Figure 22: Primary market for plastic bottles

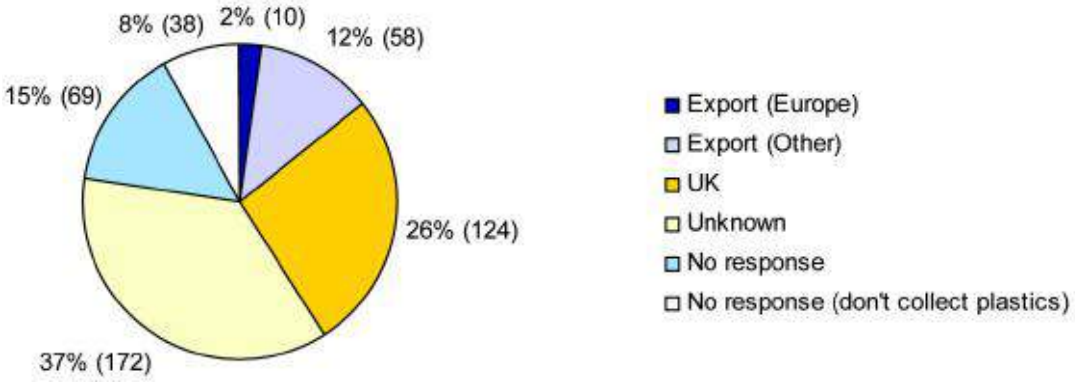


Figure 22 demonstrates that only 26% of local authorities stated that the plastic bottles they collect are sold to a UK market; a proportion of these may in fact be selling to UK-based traders, with no guarantee that the material is in fact being reprocessed in the UK. It can be assumed that the majority of the remaining local authorities sell either directly or indirectly to Far East markets such as China.

The survey data revealed that 37% of local authorities claimed not to know where their plastic bottles were being sold. Where local authorities operate in-house collections they are required to keep a record of where material is sent under the Duty of Care regulations (www.netregs.gov.uk). Where a third party is contracted to collect and handle dry recyclables and residual waste they, not the local authority, are responsible for keeping a record of the collected material. This may explain why 37% of local authorities collecting plastic bottles stated that they did not know where the material was being sold. With increasing householder demand for information regarding their recyclables however, local authorities would benefit from knowing where their bottles have been sent for reprocessing and that they have been recycled through suitable end markets.

12.3 Non-bottle plastic market

There are markets in the UK for plastic carrier bags and potential markets for sorted plastic pots and tubs from domestic sources, but no known markets for mixed plastic packaging. It can therefore be assumed that mixed plastic packaging is exported for recycling. In many cases it is a third party waste management company or agent who will be selling the material.

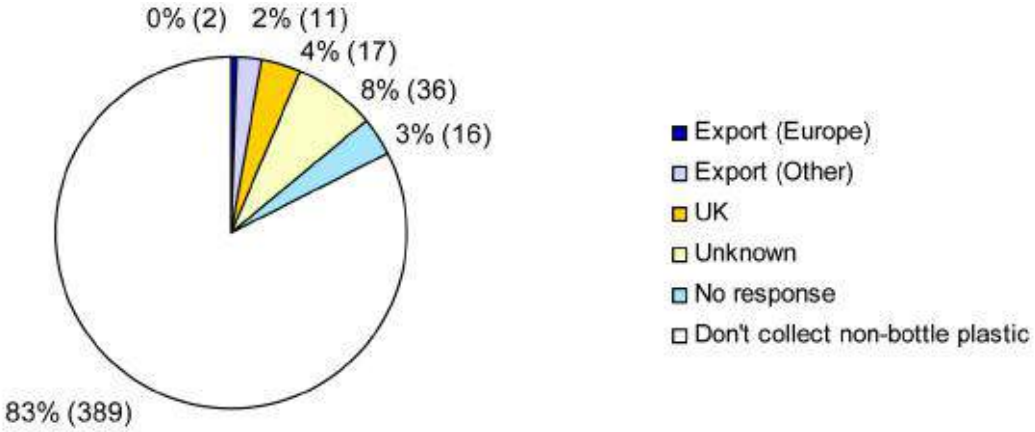
As can be seen (Figure 23) a majority of respondents either didn't know or didn't specify where the collected non-bottle material was going. Seventeen of the local authorities stated that they were using a UK market. As with bottles, a proportion of these may in fact be selling to UK-based traders, with no guarantee that the material is in fact being reprocessed in the UK. This is especially likely if they are dealing with mixed plastic packaging, due to the lack of UK markets for this material.

More work is urgently required to improve transparency of the non-bottle plastic markets. There is also a need to demonstrate good practice collection and handling to local authorities considering mixed plastic packaging. It is recommended that case study work be undertaken to further assess those local authorities that are currently collecting other household plastics for recycling in order to progress this.

Over half of those local authorities collecting non-bottle plastics are not aware of the end market. If non-bottle plastics are collected for recycling then due diligence must be used, and the agent or reprocessor should supply auditable paperwork as evidence that the material is recycled at a reputable facility.

It is probable that until the market for mixed plastic packaging is better developed and understood and a UK market becomes available that the number of local authorities collecting this material will remain comparatively low.

Figure 23: Markets for non-bottle plastic



13 Hot topics

There are currently a number of 'hot topics' associated with plastics and recycling in general. With increasing recycling targets more local authorities are investigating the potential of introducing new technologies to improve efficiency in the way waste is managed. This in turn has the potential to affect the way in which plastic bottles and other household plastics are handled. As part of this survey local authorities were asked what plans they have, if any, for introducing new technologies for waste management and recycling.

Other 'hot topics' include bioplastics and other plastics collection schemes local authorities may be involved in, such as away from home recycling.

13.1 New technologies

Figure 24 shows the different technologies local authorities are investigating and/or planning to introduce. EfW and MBT are the two main types of technology likely to be introduced over the next few years (Figure 25), with some local authorities also investigating the potential of autoclave, pyrolysis and gasification processes.

Figure 24: New technologies being introduced/investigated by local authorities

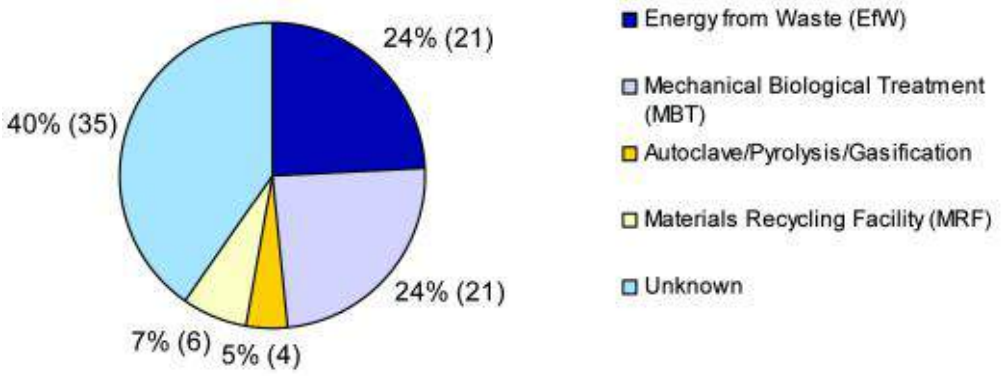
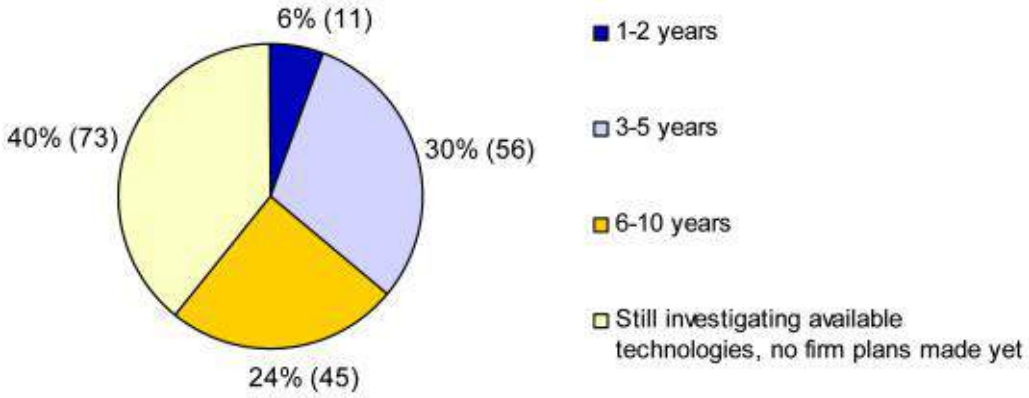


Figure 25: Timescale for the introduction of new technologies



A majority of local authorities state that the new technologies being investigated/planned will not impact on how plastic bottles are handled; these will generally still be separated out for mechanical recycling. The introduction of new technologies may however enable other household plastics to be disposed of/recovered in a more sustainable way, rather than being sent to landfill.

13.2 Bioplastics

Plastic products made from 'bioplastics' are emerging internationally. From carrier bags and chocolate boxes, from fruit food trays to water bottles, from mobile phones to CDs – there is an alternative made from biopolymers. There is however a lack of robust data to support the view that bioplastics offer environmental benefits when compared to oil-based polymers.

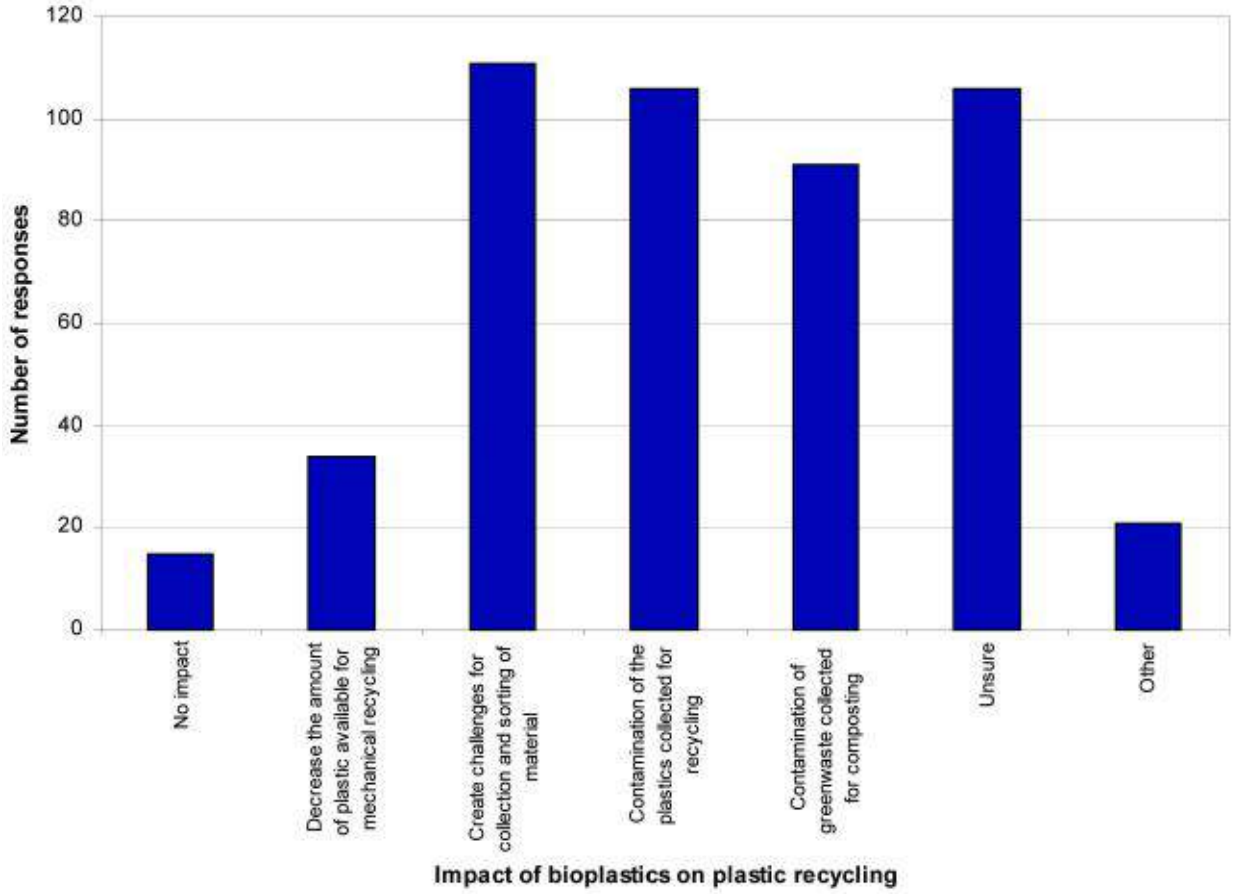
When bioplastics enter the wastestream, measures need to be in place to ensure they are being handled in a way that will realise potential environmental benefits, rather than create unforeseen problems.

Bioplastics are manufactured from polymers derived from natural renewable resources; starches, sugars or oils obtained from plants rather than from petroleum. Polymers from starch are less thermally stable than the common thermoplastics and the polymer chains are quickly broken down. Starch and polycaprolactone can degrade during recycling and extrusion of polyethylene and discolour the recyclate.

As the use of bioplastics increases, how to separate them from oil-based plastics will become a greater issue, together with ensuring that oil-based plastics do not contaminate compostable materials.

As part of this survey local authorities were asked for their views on the impact of bioplastics and how they plan on handling them. Figure 26 shows the responses.

Figure 26: Impact of bioplastics on plastics recycling



As can been seen, there are concerns regarding collection and sorting of the material and fears that it will lead to contamination of both plastics collected for recycling and green waste collected for composting. Many local authorities remain unsure about the likely impacts of bioplastics however and very few have any plans in place for handling this element of the wastestream as it's use increases. Issues surrounding the collection, handling and disposal of bioplastics should be investigated now, before the market sector grows, so that plans can be put in place for sustainable handling and disposal.

13.3 Other plastics collection schemes

Plastics and other recyclable materials consumed by the domestic market do not always enter the domestic wastestream. For example a proportion of plastic bottles are consumed and disposed of away from home, in school, office and leisure environments such as shopping centres. Local authorities are increasingly looking at the potential to divert these materials for recycling. In addition some local authorities are introducing collections for waste electrical and electronic equipment (WEEE) and agricultural plastics, such as farm film. Figure 27 shows the types of collection planned and whether or not they include plastics. Figure 28 shows that most of these schemes are either already in operation, or will be introduced over the next couple of years.

Figure 27: Types of recyclable collection local authorities are, or are planning to operate

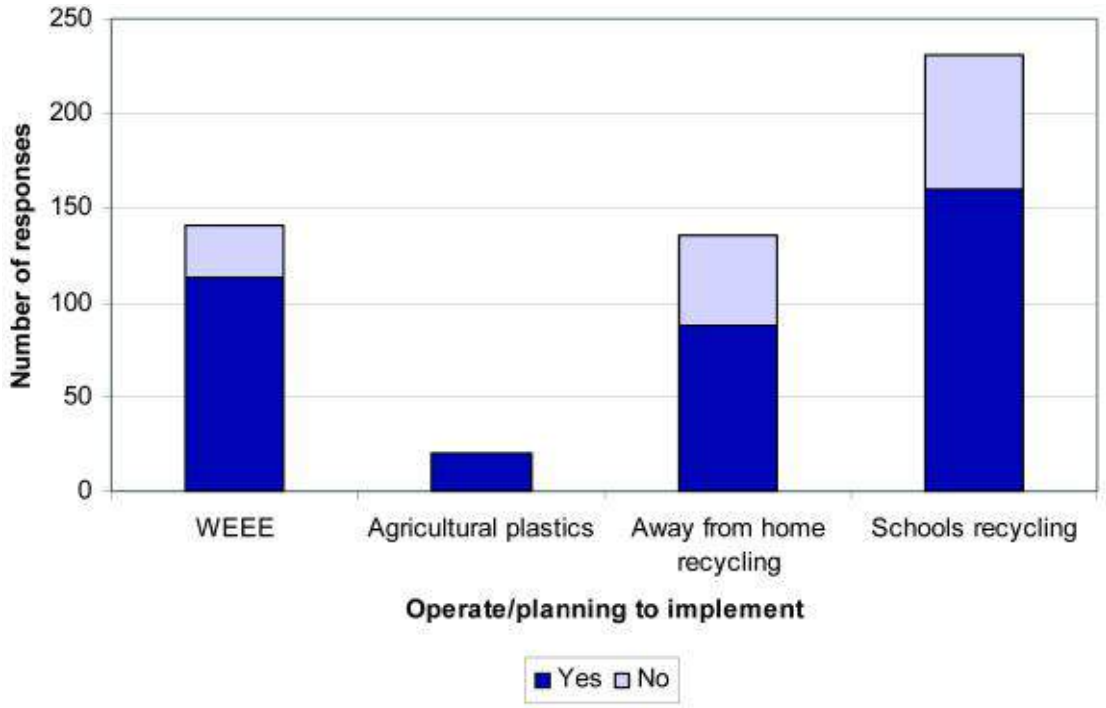
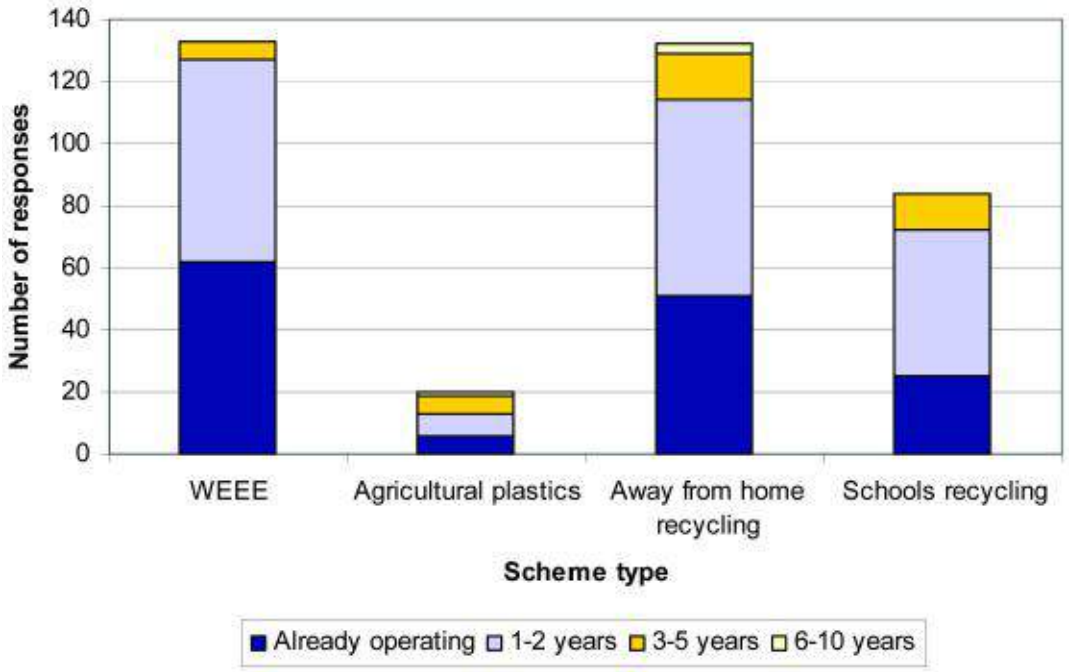


Figure 28: Timescale for implementation of different schemes



14 Conclusions

Many factors will influence the current and future collection of plastic bottles for recycling. Currently 92% of local authorities operate some form of collection scheme for plastic bottles, ranging from one or two bring sites through to comprehensive kerbside coverage. These schemes between them however are currently capturing 25% of bottles consumed through the household wastestream.

There is a clear need therefore to focus on good practice and the removal of scheme inefficiencies to optimise current systems, in addition to working towards the removal of barriers to, and encouraging the implementation of, new schemes. There is an indication that a greater improvement in recovery rates can be achieved through the improvement of scheme performance, rather than extending plastic bottle recycling scheme coverage.

Survey results demonstrate that it is important to continue to:

- Move emphasis towards kerbside systems, which on average out perform bring schemes by 4:1
- Increase the performance of existing kerbside schemes
- Provide local authorities with the information required to achieve sustainable, cost effective plastic bottle recycling for a range of different collection methods, including potential solutions for those local authorities operating sort-at-kerb systems that may be limited by vehicle capacity/number of compartments
- Review baling/handling infrastructure in the UK and assess the potential to encourage expansion where necessary and promote the use of suitable equipment
- Communicate to members of the public which plastic items are suitable for recycling in their local authority area and why other plastic items aren't currently collected in that area
- Encourage the provision of suitable alternatives to households unable to participate in kerbside such as tenement properties - work in this area is being taken forward, with a greater number of local authorities trialing and introducing recycling schemes from this type of property
- Review development in mixed plastic collection and provide fuller guidance in the area

Much work has been undertake in the past year to address the above points, hence the noticeable increase in both the number of local authorities including plastic bottles in their recyclables collections and in the quantity of bottles being diverted from the residual wastestream for recycling. It is important that this work is continued if further improvements are to be seen.

With regard to the recycling of other household plastics, 82 local authorities (just over 17%) stated that they were collecting plastics other than bottles. These plastics included various combinations of carrier bags, packaging film, tubs and trays, plant pots, expanded polystyrene and other dense plastics. These local authorities indicated that they had few or no problems with their schemes, yet few of them knew, or chose to state, where the material was being sent for recycling.

It is probable that until the market for mixed plastic packaging is better developed and understood and a UK market becomes available that the number of local authorities collecting this material will remain comparatively low. Work will also be required to demonstrate to local authorities that mixed plastic packaging is worth collecting for recycling and can be collected without causing operational issues. It is recommended that case study work be undertaken to further assess those local authorities that are currently collecting other household plastics for recycling to progress this.

The findings of this survey show that as recycling targets increase local authorities are starting to investigate new technologies in a move towards more sustainable waste management. This is unlikely to affect the quantity of plastic bottles available for mechanical recycling however, as these will generally be sorted and recycled as they are now. New EfW, MBT plants and MRFs are due to be introduced over the next few years, with autoclave, pyrolysis and gasification processes also being investigated by some local authorities.

Bioplastics are another 'hot topic' and the findings of this survey show that many local authorities are unsure of potential impacts and have no plans on how bioplastics will be handled as greater quantities enter the wastestream. It is recommended that issues surrounding the collection, handling and disposal of bioplastics should be investigated now, before the market sector grows, so that plans can be put in place for sustainable handling and disposal.

Local authority involvement in away from home recycling, including schools and commercial collections is increasing and it is probable that increasing quantities of plastics will be diverted for recycling through these schemes over the next couple of years.

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