

Summary report

Analysis of kerbside dry recycling performance in England 2007/08



This report provides an analysis of kerbside dry recycling performance for local authorities in England for 2007/08. It explores how the nature of the kerbside recycling collection and local area and population characteristics influence recycling performance, and provides benchmarks against which authorities can compare themselves.

WRAP helps individuals, businesses and local authorities to reduce waste and recycle more, making better use of resources and helping to tackle climate change.

Document reference: WRAP, 2009. *Analysis of kerbside dry recycling performance in England 2007/08* (WRAP Project EVA034-087). Report prepared by Icaro Consulting and WRAP, Banbury, WRAP.

Written by: WRAP in association with Icaro Consulting



Front cover photography:

WRAP and Icaro Consulting believe the content of this report to be correct as at the date of writing. However, factors such as prices, levels of recycled content and regulatory requirements are subject to change and users of the report should check with their suppliers to confirm the current situation. In addition, care should be taken in using any of the cost information provided as it is based upon numerous project-specific assumptions (such as scale, location, tender context, etc.).

The report does not claim to be exhaustive, nor does it claim to cover all relevant products and specifications available on the market. While steps have been taken to ensure accuracy, WRAP cannot accept responsibility or be held liable to any person for any loss or damage arising out of or in connection with this information being inaccurate, incomplete or misleading. It is the responsibility of the potential user of a material or product to consult with the supplier or manufacturer and ascertain whether a particular product will satisfy their specific requirements. The listing or featuring of a particular product or company does not constitute an endorsement by WRAP and WRAP cannot guarantee the performance of individual products or materials. This material is copyrighted. It may be reproduced free of charge subject to the material being accurate and not used in a misleading context. The source of the material must be identified and the copyright status acknowledged. This material must not be used to endorse or used to suggest WRAP's endorsement of a commercial product or service. For more detail, please refer to WRAP's Terms & Conditions on its web site: www.wrap.org.uk

Executive summary

Introduction

All mainland local authorities in England have now invested in some form of kerbside collection for dry recycling. The analysis in this report looks at data for 2007/08, to explore the range of performance of these collections and the factors which influence them.

Throughout the report, local authorities can find tailored benchmarks, according to a range of factors such as the specific materials they collect for recycling (paper, card, glass, cans and plastics), the specific type of dry recycling service they currently operate, and the type of local authority they are. Armed with this information, they can ask questions about the relative performance of their dry recycling service and the reasons for the variations. As the pressures on local budgets grow, it will be ever more important to be sure that authorities have the right recycling service and they are performing as well as possible.

The report identifies four tiers of performance: *Low*, *Below average*, *Above average*, and *High*. This classification will both allow local authorities to benchmark their performance against other 'like' authorities, and also allow them to design operational targets so that they can continue driving up recycling rates in their areas.

Key Findings

There are significant variations in the success local authorities have in collecting different materials for recycling, which are summarised in the table below.

Kerbside material-specific dry recycling performance, England 2007/08

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 18 | 46 | 0 | 0 | 0 | 72 |
| Lower quartile | 63 | 95 | 5 | 29 | 5 | 140 |
| Median | 73 | 129 | 9 | 43 | 10 | 182 |
| Upper quartile | 88 | 155 | 11 | 53 | 11 | 216 |
| Maximum | 125 | 207 | 18 | 78 | 20 | 305 |

*As values are rounded to the nearest whole number, minimum values of zero may occur.

The analysis in this report looks at a wide range of factors that exert an influence on recycling performance, including population density or sparsity, deprivation, ruralness, local authority type and kerbside recycling service profile (including scheme type). The key finding is that there is **no single variable or characteristic** that can explain variations in kerbside dry recycling performance. Rather it is a combination of factors, the importance of which will change depending on the type of authority that influences outcomes.

For example, **deprivation** is important for local authorities that are most deprived, while affluence is important for local authorities that are the most affluent. However, it does not appear to be that significant for those authorities that are neither prosperous nor deprived (i.e. are 'average'). Similarly, how rural or urban an authority is important for extremely rural and extremely urban authorities, but not for those authorities in between.

The characteristics of local authority kerbside dry recycling services were tested to see if they played an important role in determining dry recycling performance. The conclusions are:

- The **kerbside scheme type** (e.g. kerbside sort, single stream co-mingled or two stream co-mingled), acting in isolation, was not a defining influence in that no one type performed consistently better than the others. There was a lot of variation in material specific recycling performance across all scheme types, and scheme characteristics can not be considered in isolation from each other or from local authority characteristics.
- In general those local authorities offering a **fortnightly collection of residual waste** performed better than those offering a weekly residual waste collection, irrespective of the dry recycling scheme type.
- **Frequency of recycling collections** alone did not play a dominant role in determining recycling performance, but did in conjunction with other service characteristics. Weekly kerbside sort schemes generally performed better on dry recycling than fortnightly schemes, in particular when residual waste collection was fortnightly. It is not possible to make the same comparison for single stream or two stream co-mingled schemes as almost all schemes included in the analysis were fortnightly recycling.
- **Container type** alone was also not a significant factor in determining service performance. For example, kerbside sort and two stream co-mingled schemes used boxes and/or sacks while the majority of single stream co-mingled schemes analysed used wheeled bins. However, when container type was combined with recycling and residual waste frequency to give an indication of overall recycling capacity, weekly box schemes with fortnightly residual waste collection performed similarly to fortnightly wheeled bin schemes with fortnightly residual waste collection and both these were generally the better performing services.

In summary there is no single variable or characteristic that can explain all of the variation in kerbside recycling performance across local authorities. Rather it is a combination of factors, the importance of which will change depending on the type of authority. While it is a relatively straight forward task to identify a number factors affecting recycling performance at the national level, it is a much more complex task to identify their relative influence as performance may also be affected by additional and less easily quantifiable factors such as communications activity.

Contents

- Executive summary** 1
- 1.0 Introduction** 4
- 2.0 Methodology** 5
- 3.0 Material-specific performance** 7
- 4.0 Local authority characteristics** 9
 - 4.1 Socio-demographic characteristics 9
 - 4.2 Defra Classification of LA Districts and Unitary Authorities in England, 2005 10
 - 4.3 ONS Local Authority Area Classification 2001 13
- 5.0 Kerbside recycling service characteristics** 19
 - 5.1 Kerbside sort services 21
 - 5.2 Single stream co-mingled services 22
 - 5.3 Two stream co-mingled services 24
 - 5.4 Overview of kerbside recycling services 25

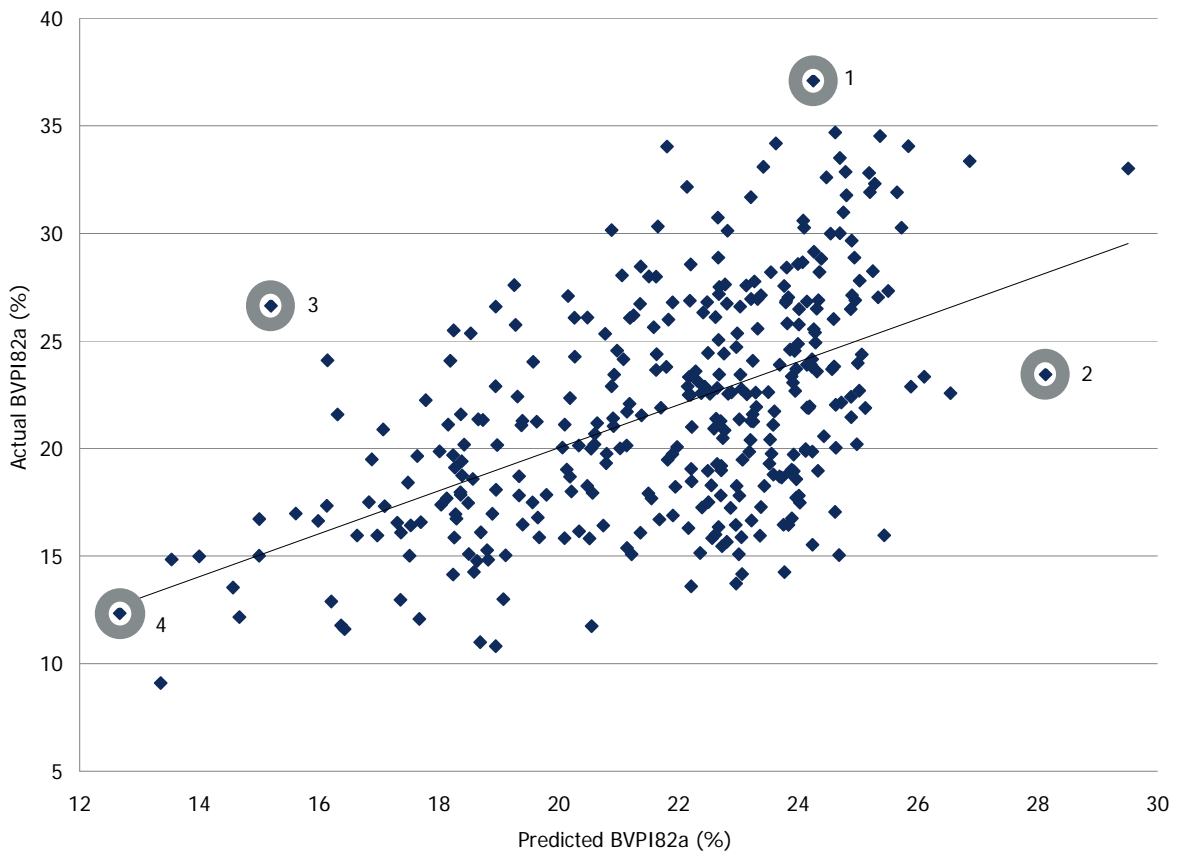
1.0 Introduction

WRAP has undertaken a series of statistical analyses of 2007/08 local authority dry recycling data to better understand the drivers of, and barriers to, ongoing improvement in recycling performance.

One of these analyses, a statistical regression analysis of the socio-demographic variables influencing BVPI82a (i.e. local authority household dry recycling performance), sets the backdrop to the work presented in this Report. Undertaken by Icaro Consulting, the analysis demonstrated three things:

- **Socio-demographic factors and the prevailing ‘characteristics’ of an area do have a significant influence on recycling performance** - just over a quarter (26.5%) of the variation in local authority dry recycling performance can be explained by the characteristics of the local area and population. Some local authorities (i.e. typically those in high density areas with high levels of deprivation) face a series of additional challenges that others do not (i.e. those authorities with affluent areas with lots of detached, low density housing).
- **However, performance-related factors are more important** - the remaining 73.5% of the variation in recycling performance can be explained by factors other than socio-demographic characteristics. The regression model provides the means to calculate a ‘predicted recycling rate’ for each local authority, which can then be compared to its actual recycling rate. This shows how well a local authority is doing relative to how well, on the basis of its socio-demographic profile, it should be doing. The results for English local authorities in 2007/08 are displayed in Figure 1. Each point represents an individual local authority. Those above the line (e.g. local authority 1 and 3) are achieving higher dry recycling rates than we would expect based on local conditions, those below the line (e.g. local authority 2) are achieving lower dry recycling rates than we would expect, while those close to the line (e.g. local authority 4) are recycling in line with expectation.

Figure 1 Actual vs. predicted local authority dry recycling performance, England 2007/08



- **There is a need for greater sophistication when understanding the role of kerbside recycling collections in local authority performance** - while the simple presence, or absence, of kerbside collections may have been a very strong predictor of recycling performance several years ago, the presence of kerbside now – in 2007/08 – only explains some of the variation in performance. This is simply because the vast majority of authorities now have some form of kerbside collection. This particular ‘frontier of recycling’ has largely been passed and the challenge of increasing performance has consequently moved on to other features of service provision, such as the nature and quality of the kerbside dry recycling service.

In response to the call for greater sophistication in understanding what is underpinning variations in recycling performance between local authorities, the focus of this report is **kerbside dry recycling performance**. It aims to explore how the nature of the kerbside recycling collection (i.e. the types of materials collected, collection frequency) alongside local area and population characteristics, influences overall recycling performance. The key factors under exploration are:

- The demographics of an area (e.g. population density, deprivation levels) and the ‘type’ of local authority - as defined by official classifications from Defra and the Office for National Statistics (ONS) which look, among other things, how rural a local authority is and its socio-economic characteristics (e.g. housing stock, industry type and educational attainment);
- The interrelationships between kerbside dry recycling collections and bring site recycling; between kerbside collections and overall household dry recycling (i.e. bvpi82a) and overall dry and organic recycling (i.e. bvpi82ab); and between kerbside collections and overall household residual waste arisings;
- The nature of the kerbside recycling scheme (e.g. kerbside sort, single stream co-mingled, two stream co-mingled), the frequency of collection and type of container.

This report has been designed to allow individual local authorities to **benchmark performance**. The Report contains a series of tailored benchmarks throughout, according to a range of factors such as: the specific materials that local authorities collect for recycling, the specific type of dry recycling service they currently operate, and the type of local authority they are.

This report is interested in the full continuum of performance, from the minimum performance through to the maximum. It contains a series of graphs and tables that categorise local authorities – for any specific material, or collection type – into four tiers of performance:

- *Low performance* – local authorities with recycling yields per household that place them in the “lower quartile” (i.e. the bottom 25% of all local authorities)
- *Below average performance* – local authorities with recycling yields per household that are greater than the lower quartile, but less than the median
- *Above average performance* – local authorities with recycling yields per household that are greater than the median, but less than the upper quartile
- *High performance* – local authorities with recycling yields per household that place them in the “upper quartile” (i.e. the top 25% of all local authorities) measure progress against objectives and targets, so you will know in advance if you are likely to hit or miss them;

Not only will this classification allow local authorities to benchmark their performance against other ‘like’ authorities, but it will also allow them to better design operational targets so that they can continue driving up recycling rates in their areas.

2.0 Methodology

The sources of data that formed the basis of the statistical analyses were as follows:

Recycling yields

Overall and material specific kerbside recycling figures were calculated for 353 of the 354 local authorities charged with the collection of household waste in England that operated kerbside recycling services in 2007/08. The analysis does not therefore take into account changes in the number of local authorities there were

introduced in England as of 1 April 2009. Calculations were based on local authority WasteDataFlow returns for 2007/08, with annual yields per household (not per household served) calculated using dwelling stock figures for Quarter 4.

In a number of cases local authorities reported a single co-mingled tonnage for all the materials collected for recycling via kerbside schemes rather than reporting tonnages for the individual materials. In such cases estimates of the co-mingled material composition were made based on the standard method provided in Section 3.8 of the WasteDataFlow guidance manual.

Yields are based on the amount of material collected and therefore exclude collection rejects. However, rejects that occur further down the line at the Material Recovery Facility (MRF) or at the gate of the reprocessor are not excluded. Some allowance has been made for material rejected at MRFs, and where this occurs it has been clearly stated in the report.

For the purposes of this analysis this rate is assumed to be 10%, based on the typical average reject rate of 10.8% currently quoted by the Environment Agency. The 10% applied here may underestimate rejects for single stream co-mingled schemes and overestimate for two stream comingled schemes as not all material from two stream schemes may go to a MRF. However, for the purposes of this analysis a standard rate has been applied to both scheme types.

Throughout the Report, dry recycling yields are presented **separately for five materials** – paper without card, paper & card, cans, glass and plastic – and, for those local authorities who collect them, **all five materials together**. Yields do not necessarily relate to total kerbside recycling as some local authorities may collect additional materials (e.g. batteries).

Local authority waste data

General local authority recycling and waste figures were calculated using household waste statistics for England for 2007/08 available via WasteDataFlow. These figures included the percentage of household waste that was recycled (bvpi 82a), the percentage of household waste that was recycled and composted (bvpi 82ab) and the amount of residual waste per household collected as part of the regular kerbside residual collections (regular collection). Residual household waste collected via Household Waste Recycling Centres (HWRCs) and other routes was excluded as this analysis focuses primarily of the “kerbside” waste environment.

Local authority socio-demographic data

Population density 2007/08 - calculated for each local authority as persons per hectare and figures for 2007/08 were obtained via WasteDataFlow.

English Indices of Deprivation 2007 - this is the Government's official measure of multiple deprivation, and contains seven domains across income, employment, health and disability, education skills and training, barriers to housing and services, living environment, and crime.

Defra Classification of Local Authority Districts and Unitary Authorities in England 2005 – the aim of this classification is to identify different levels (in terms of the total rural population) and types (in terms of the distribution of rural population in different types of settlements) of ruralness among local authorities. There are six classes of districts: Major Urban, Large Urban, Other Urban, Significant Rural, Rural-50 and Rural-80.

Office for National Statistics (ONS) Local Authority Area Classification 2001 - this groups areas together into clusters according to key characteristics common to the population. Based on Census Data on population demographics, socio-economic variables, housing, employment and industry sector, eight “supergroups” are identified (which can be further broken down into 13 “groups”) for the UK. Seven of these “supergroups” and 12 “groups” are relevant to England.

Recycling service profiles

A dry recycling service profile is defined here as the combination of the dry recycling scheme and the associated residual waste scheme provided to households. Information on dry recycling services operated by local authorities in 2007/08 was obtained via individual local authority websites and direct contact with local authorities during 2008 and also from WasteDataFlow returns for 2007/08.

This information was then combined with the yield data described above. This exercise was completed successfully for 299 (or 84%) of the 354 local authorities. Local authorities were included in this part of the analysis if a single kerbside service served 90% or more of households currently receiving a recycling service in the local authority area. This criterion was necessary as local authorities report recycling tonnage data via WasteDataFlow as single figures for each material category, irrespective of how many different schemes may have contributed to that tonnage.

Dry recycling service profiles were classified using the following criteria:

- Type of dry recycling scheme e.g. kerbside sort, single stream co-mingled etc.
- Frequency of dry recycling collection e.g. weekly, fortnightly etc.
- Type of dry recycling container e.g. box/sack, wheeled bin etc.
- Frequency of residual waste collection e.g. weekly, fortnightly etc.

Data Presentation

This report uses a series of graphs and tables to outline performance (defined by the weight of material collected per household in the authority, not per household served, in 2007/08). Both of these presentational devices are based on the following data:

- *Minimum* – indicates the lowest recorded recycling yield, but excludes statistical outliers (i.e., extreme values).
- *Lower quartile* – indicates the recycling yield below which the bottom 25% of all local authorities performed (performance is referred to as “**low**”).
- *Median* – indicates the recycling yield which is the mid performance i.e., 50% of local authorities performed lower than this figure and 50% performed higher. Performance below this mid point but above the lower quartile is referred to here as “**below average**”. In contrast, performance above the median but below the upper quartile is referred to here as “**above average**”.
- *Upper quartile* – signifies the recycling yield above which the top 25% of all local authorities performed (performance is referred to as “**high**”).
- *Maximum* – indicates the highest recorded recycling yield, but excludes statistical outliers (i.e., extreme values).
- *Count* – the total number of local authorities.

3.0 Material-specific performance

This section of the report summarises material-specific yields across local authorities in 2007/08. In summary:

Paper without card - around 40% of local authorities reported a kerbside recycling collection of paper without card. The average annual performance was 76kg per household, with ‘high performance’ (i.e. the top 25%) 88kg/hh or more, and ‘low performance’ (i.e. the bottom 25%) less than 63kg/hh.

Paper and card - around 60% of local authorities reported a kerbside recycling collection of paper and card. The average annual performance was 126kg/hh, with ‘high performance’ more than 155kg/hh and ‘low performance’ less than 95kg/hh.

Cans - almost all (96%) local authorities reported a kerbside recycling collection of cans. The average annual performance was 8kg/hh, with ‘high performance’ more than 11kg/hh and ‘low performance’ less than 5kg/hh.

Glass - almost four in five (78%) local authorities reported a kerbside recycling collection of glass. The average annual performance was 41kg/hh, with 'high performance' more than 53kg/hh and 'low performance' less than 29kg/hh.

Plastic - close to three in four (74%) of local authorities reported a kerbside recycling collection of plastic (i.e. plastic bottles and/or mixed plastic). The average annual performance was 9kg/hh with 'high performance' more than 11kg/hh and 'low performance' less than 5kg/hh.

Full data (against which local authorities can benchmark performance) is presented in Table 1.

Table 1 Kerbside material-specific dry recycling performance, England 2007/08

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 18 | 46 | 0 | 0 | 0 | 72 |
| Lower quartile | 63 | 95 | 5 | 29 | 5 | 140 |
| Median | 73 | 129 | 9 | 43 | 10 | 182 |
| Upper quartile | 88 | 155 | 11 | 53 | 11 | 216 |
| Maximum | 125 | 207 | 18 | 78 | 20 | 305 |
| Count | 140 (40%) | 213 (60%) | 341 (96%) | 276 (78%) | 261 (74%) | 126 (36%) |

*As values are rounded to the nearest whole number, minimum values of zero may occur.

In terms of the groups of materials collected by local authorities, the analysis demonstrates the following:

All 5 materials – just over one in three (36%) local authorities collected all five of the materials mentioned above via kerbside recycling schemes in 2007/08. Among these, the average annual performance was 177kg/hh, with 'high performance' more than 216kg/hh and 'low performance' less than 140kg/hh.

Paper, card, cans and glass – 5% collected this bundle of materials. Among these, the average annual performance was 142kg/hh, with 'high performance' more than 167kg/hh and 'low performance' less than 114kg/hh.

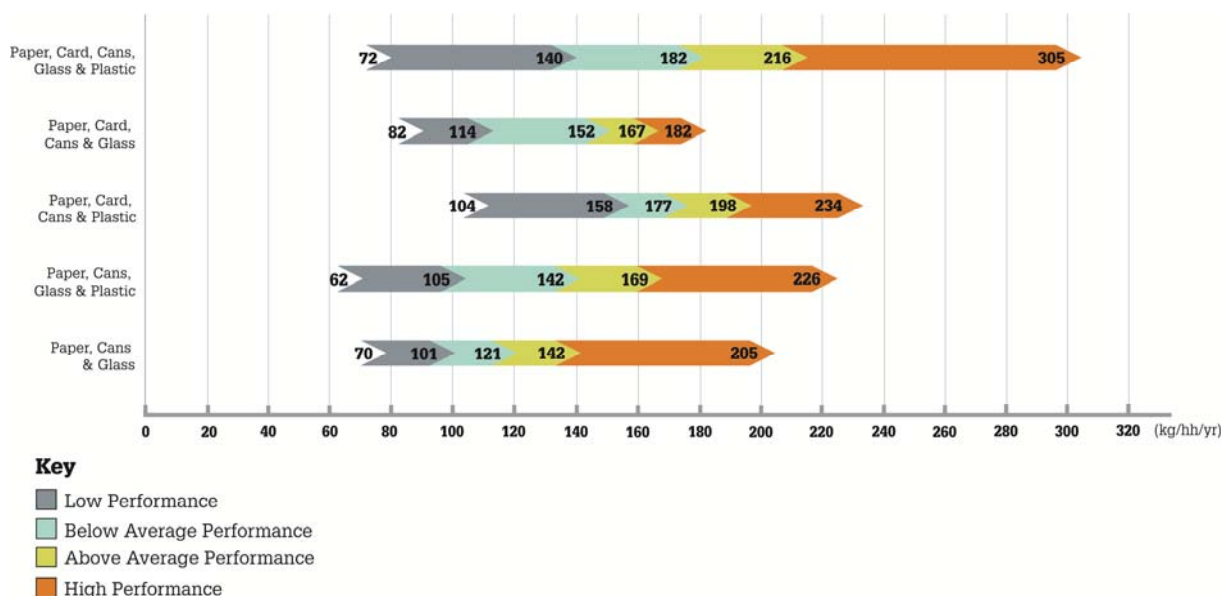
Paper, card, cans and plastic – 18% collected this bundle of materials. Among these, the average annual performance was 172kg/hh, with 'high performance' more than 198kg/hh and 'low performance' less than 158kg/hh.

Paper, cans, glass and plastic – 17% collected this bundle of materials. Among these, the average annual performance was 137kg/hh, with 'high performance' more than 169kg/hh and 'low performance' less than 105kg/hh.

Paper, cans and glass – 18% collected this bundle of materials. Among these, the average annual performance was 122kg/hh, with 'high performance' more than 142kg/hh and 'low performance' less than 101kg/hh.

As shown in Figure 2, overall the best performing authorities either collected all five materials or the combination of paper, card, cans and plastic.

Figure 2 Kerbside material-specific dry recycling performance, England 2007/08



Further analyses, for example taking into consideration the impact of bring site recycling, demonstrates that these variations in performance *cannot be explained* by the interplay with bring site recycling, organic waste collections or the overall amount of residual waste. For example, while local authorities with low performance did have marginally higher material specific recycling yields at bring sites, this did not make up for the shortfall at the kerbside. Overall, authorities with low dry recycling performance at the kerbside still had low performance *even when* kerbside and bring site recycling was combined. Similarly, authorities with low and below average kerbside dry recycling performance generally also had lower overall household dry recycling rates (bvpi82a), dry plus organic recycling rates (bvpi82ab) and higher residual waste arisings per household than those with better kerbside dry recycling performance.

4.0 Local authority characteristics

This section looks at kerbside dry recycling performance in 2007/08 according to different local authority characteristics, according to the following classifications:

- Socio demographic characteristics (population density and English Indices of Deprivation 2007)
- Defra classification of Local Authority Districts and Unitary Authorities in England 2005
- ONS Local Authority Area Classification 2001

4.1 Socio-demographic characteristics

The analysis reveals that deprivation and population density both present challenges to dry recycling performance. In both cases there is a negative correlation with recycling, i.e. as deprivation and population density increase, dry recycling performance decreases.

Taking population density first, this explains almost 11% of the variation in kerbside yields for paper without card ($R^2 = 0.11$) and 8% of the variation for paper and card ($R^2 = 0.08$). However, the correlation is much weaker for the other materials (explaining only between 2 - 4% of the variation in performance - cans: $R^2 = 0.04$; glass: $R^2 = 0.04$; plastic: $R^2 = 0.02$). When the five materials are considered together (for the 126 authorities collecting all five materials) population density explains, in total, 8% of the variation in kerbside dry recycling performance ($R^2 = 0.08$).

Deprivation exerts a stronger influence - the level of deprivation within an authority explains around 30% of the variation in kerbside yields of paper without card ($R^2 = 0.30$) and 23% of the variation in kerbside yields of paper

and card ($R^2 = 0.23$). The correlation is weaker for the other materials, but 6% of the variation in kerbside yields for cans ($R^2 = 0.06$), 15% of the variation for glass ($R^2 = 0.15$) and 10% for plastic ($R^2 = 0.10$) can still be explained by the level of deprivation. When the five materials are considered together (for the 126 authorities collecting all five materials) the level of deprivation explains 28% of the variation in kerbside dry recycling performance ($R^2 = 0.28$).

While there is little doubt that both of these factors present a challenge to kerbside dry recycling performance, the analysis also reveals a significant range in the results. Less deprived authorities can achieve both high and low performance, as can more deprived authorities. In fact, the impact on recycling performance is most pronounced at the extremes, while for those in the middle of the distribution these factors explain much less of the variation in performance.

4.2 Defra Classification of LA Districts and Unitary Authorities in England, 2005

An analysis of the impact of 'ruralness' on recycling performance is possible using Defra's classification, which differentiates six classes of local authority, outlined in Table 2.

Table 2 Defra Classification of Local Authority Districts and Unitary Authorities in England 2005

| Classification | Characteristics | No. of LAs |
|-------------------|--|------------|
| Major urban | Authorities with either 100,000 people or 50 percent of their population in an urban area with a population of more than 750,000. | 76 |
| Large urban | Authorities with either 50,000 people or 50 percent of their population in one of 17 urban areas with a population of between 250,000 and 750,000. | 45 |
| Other urban | Authorities with fewer than 37,000 people or less than 26 percent of their population in rural settlements and larger market towns. | 55 |
| Significant rural | Authorities with more than 37,000 people and more than 26 percent of their population in rural settlements and larger market towns. | 53 |
| Rural-50 | Authorities with at least 50 percent but less than 80 percent of their population in rural settlements and larger market towns. | 52 |
| Rural-80 | Authorities with at least 80 percent of their population in rural settlements and larger market towns. | 73 |

The data in tables 3 – 8 demonstrate that local authorities classified as 'Major urban' generally reported slightly lower paper, paper & card and can kerbside recycling yields than the rural authorities (Significant rural, Rural-50 and Rural-80). However, this was not always the case and authorities with high and low performance are present in both groups. For glass and plastic kerbside recycling the 'Major urban' authorities again reported slightly lower yields, but there was a much greater overlap with the range of performance observed for the more rural authorities.

NB. Lower and upper quartiles are only listed in tables 3 – 8 where five or more authorities are collecting a specific material. Where between five and 10 authorities are collecting a material lower and upper quartiles are included, but these should be treated with caution as the sample size is small. In these cases the better measures are minimum, maximum and median.

**As values are rounded to the nearest whole number, minimum values of zero may occur.*

Table 3 Kerbside material-specific dry recycling performance – ‘Major urban authorities’ - England 2007/08

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 18 | 46 | 0 | 0 | 0 | 72 |
| Lower quartile | 54 | 69 | 4 | 26 | 4 | 121 |
| Median | 65 | 95 | 6 | 36 | 6 | 152 |
| Upper quartile | 84 | 131 | 9 | 46 | 11 | 195 |
| Maximum | 122 | 184 | 13 | 77 | 16 | 265 |
| Count | 32 | 44 | 74 | 69 | 60 | 38 |

Table 4 Kerbside material-specific dry recycling performance – ‘Large urban authorities’ – England 2007/08

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 39 | 72 | 1 | 3 | 0 | 77 |
| Lower quartile | 53 | 112 | 6 | 30 | 6 | 168 |
| Median | 71 | 132 | 10 | 47 | 10 | 191 |
| Upper quartile | 83 | 152 | 12 | 53 | 11 | 221 |
| Maximum | 124 | 176 | 18 | 63 | 19 | 257 |
| Count | 14 | 31 | 42 | 34 | 36 | 19 |

Table 5 Kerbside material-specific dry recycling performance – ‘Other urban authorities’ – England 2007/08

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 52 | 75 | 0 | 0 | 0 | 131 |
| Lower quartile | 64 | 104 | 6 | 25 | 7 | 151 |
| Median | 67 | 123 | 8 | 37 | 10 | 162 |
| Upper quartile | 68 | 151 | 11 | 47 | 12 | 199 |
| Maximum | 92 | 203 | 16 | 74 | 18 | 239 |
| Count | 17 | 38 | 53 | 43 | 42 | 26 |

Table 6 Kerbside material-specific dry recycling performance – ‘Significant rural authorities’ – England 2007/08

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 40 | 68 | 0 | 3 | 0 | 80 |
| Lower quartile | 68 | 110 | 5 | 33 | 7 | 154 |
| Median | 83 | 130 | 9 | 50 | 10 | 192 |
| Upper quartile | 98 | 152 | 11 | 59 | 11 | 225 |
| Maximum | 119 | 189 | 15 | 74 | 17 | 278 |
| Count | 22 | 31 | 50 | 40 | 38 | 16 |

Table 7 Kerbside material-specific dry recycling performance – ‘Rural-50 authorities’ – England 2007/08

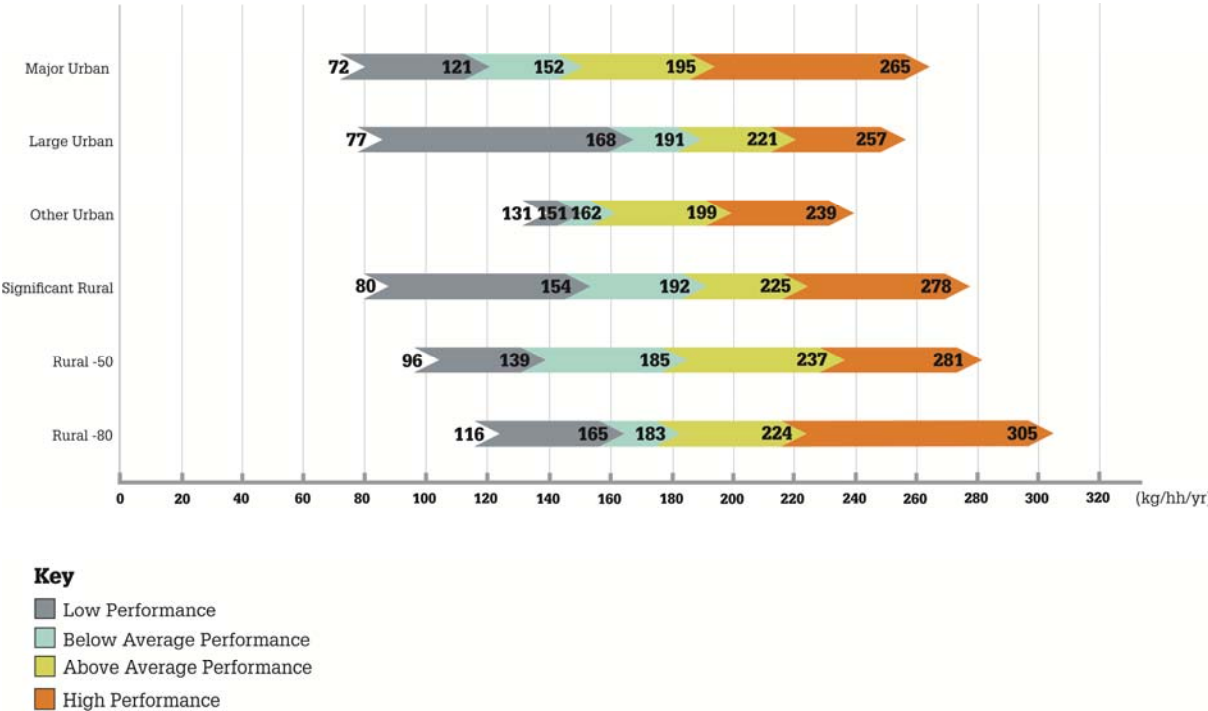
| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 56 | 61 | 4 | 3 | 0 | 96 |
| Lower quartile | 73 | 96 | 6 | 33 | 7 | 139 |
| Median | 84 | 154 | 10 | 42 | 10 | 185 |
| Upper quartile | 90 | 171 | 11 | 60 | 11 | 237 |
| Maximum | 125 | 189 | 14 | 78 | 14 | 281 |
| Count | 27 | 25 | 52 | 35 | 38 | 10 |

Table 8 Kerbside material-specific dry recycling performance – ‘Rural-80 authorities’ – England 2007/08

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 45 | 53 | 1 | 1 | 0 | 116 |
| Lower quartile | 69 | 100 | 6 | 33 | 5 | 165 |
| Median | 81 | 143 | 10 | 47 | 11 | 183 |
| Upper quartile | 91 | 170 | 12 | 56 | 12 | 224 |
| Maximum | 119 | 207 | 18 | 74 | 15 | 305 |
| Count | 28 | 44 | 70 | 55 | 47 | 17 |

When only those authorities collecting all five materials are considered (126 authorities in total) then 'Major urban' and 'Other urban' authorities again report lower recycling yields than the rural authorities (Figure 3), although 'Large urban' authorities perform in line with that of the rural authorities – indicating that the impact of 'ruralness' may be less clear cut than has previously been supposed. Indeed, Figure 3 makes clear the wide range in performance – from very high to very low – among local authorities classified as 'Rural-80'.

Figure 3 Kerbside dry recycling performance - local authorities collecting all 5 materials, according to the Defra Classification of Local Authorities 2005, England 2007/08



4.3 ONS Local Authority Area Classification 2001

Material-specific kerbside recycling yields were calculated for each of the local authority groups identified for England by the Office of National Statistics Local Authority Area Classification 2001. This classification defines local authorities based on key socio-demographic characteristics common to the population (e.g. demographic, household composition, housing, socio-economic and employment). Based on these variables eight 'supergroups' have been identified which can be further broken down into 13 'groups'. These are listed in Table 9. Seven 'supergroups' and 12 'groups' are relevant to England. Groups are defined by their characteristics that are above the national average for the UK.

Table 9 ONS Local Authority Area Classification 2001

| Supergroup | Group | Characteristics (above the national average) | No. of LAs |
|------------------------------------|------------------------------------|---|---------------|
| Cities and Services | Regional Centres | <i>Households:</i> one person households <i>Housing:</i> flats <i>Employment:</i> students | 19 |
| | Centres with Industry | <i>Demographic:</i> Indian, Pakistani or Bangladeshi people <i>Housing:</i> terraced <i>Socio-economic:</i> no central heating | 21 |
| | Thriving London Periphery | <i>Demographic:</i> population density; Indian, Pakistani or Bangladeshi people; Black people; not born in UK; people aged 25 to 44 <i>Households:</i> one person households <i>Housing:</i> flats <i>Socio-economic:</i> higher education qualifications; public transport to work <i>Employment:</i> students; professional/managerial occupations | 9 |
| London Suburbs | London Suburbs | <i>Demographic:</i> population density; Indian, Pakistani or Bangladeshi people; Black people; not born in UK; people aged 0 to 4 and aged 25 to 44 <i>Households:</i> average no. of people per room <i>Housing:</i> flats <i>Socio-economic:</i> public transport to work | 12 |
| London Centre | London Centre | <i>Demographic:</i> population density; Indian, Pakistani or Bangladeshi people; Black people; not born in UK; people aged 25 to 44 <i>Households:</i> one person households; average no. of people per room <i>Housing:</i> flats; rented properties <i>Socio-economic:</i> public transport to work; average education qualifications <i>Employment:</i> men who work part time; unemployed; students; professional/managerial occupations; <i>Industry:</i> finance | 8 |
| London Cosmopolitan | London Cosmopolitan | <i>Demographic:</i> population density; Indian, Pakistani or Bangladeshi people; Black people; not born in UK; people aged 0 to 4 and 25 to 44 <i>Households:</i> one adult and dependent children households; one person households; average no. of people per room <i>Housing:</i> flats; rented properties <i>Socio-economic:</i> public transport to work; higher education qualifications <i>Employment:</i> students; unemployed; men who work part time | 7 |
| Prospering UK | Prospering Smaller Towns | No variables above national average | 111 |
| | New and Growing Towns | No variables above national average | 23 |
| | Prospering Southern England | <i>Housing:</i> flats <i>Socio-economic:</i> two or more cars <i>Employment:</i> professional/managerial occupations | 45 |
| Coastal and Countryside | Coastal and Countryside | <i>Demographic:</i> people aged 45 to 64 <i>Households:</i> single pensioner households <i>Industry:</i> hotel and catering; agriculture and fishing | 45 |
| Mining and Manufacturing | Industrial Hinterlands | <i>Socio-economic:</i> people of working age suffering from long-term illness | 23 |
| | Manufacturing Towns | No variables above national average | 31 |
| Northern Ireland Countryside | Northern Ireland Countryside | This classification is not relevant to England and is therefore excluded from the current analysis. | n/a |

Given the small numbers involved in the classification of the London boroughs – which are subject to four groupings by ONS - we have instead chosen to group the 32 London boroughs based on the ONS definition of 'Inner London' (14 authorities) and 'Outer London' (19 authorities).

The data in tables 10 – 19 demonstrates that the majority of authorities with high performance are classified as 'Prospering UK' (especially 'Prospering Southern England'), while those with low performance are classified as 'Cities and Services', 'Mining and Manufacturing' and 'Centres with Industry'. On average, 'Outer London' boroughs outperform their 'Inner London' counterparts. While prospering UK authorities achieve both 'high' and 'low' performance, high performance is more common. And, once again, the distinction is not as clear among those with average performance. While fewer in number, there are authorities with lower performance that are rural and prospering, just as there are those with higher performance who are urban and more deprived.

NB. Lower and upper quartiles are only listed in tables 10 – 19 where five or more authorities are collecting a specific material. Where between five and 10 authorities are collecting a material lower and upper quartiles are included, but these should be treated with caution as the sample size is small. In these cases the better measures are minimum, maximum and median.

** As values are rounded to the nearest whole number, minimum values of zero may occur.*

Table 10 Kerbside material-specific dry recycling performance – 'Regional Centres' – England 2007/08

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 53 | 63 | 3 | 0 | 1 | 123 |
| Lower quartile | - | 90 | 5 | 24 | 6 | 133 |
| Median | 67 | 113 | 7 | 33 | 7 | 138 |
| Upper quartile | - | 124 | 10 | 44 | 9 | 153 |
| Maximum | 82 | 170 | 12 | 55 | 12 | 227 |
| Count | 3 | 16 | 18 | 12 | 16 | 9 |

Table 11 Kerbside material-specific dry recycling performance – 'Centres with Industry' – England 2007/08

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 18 | 63 | 1 | 3 | 0 | 77 |
| Lower quartile | 44 | 76 | 3 | 21 | 4 | 116 |
| Median | 54 | 86 | 5 | 27 | 6 | 140 |
| Upper quartile | 63 | 90 | 9 | 43 | 11 | 162 |
| Maximum | 90 | 149 | 15 | 71 | 15 | 180 |
| Count | 10 | 11 | 20 | 19 | 18 | 9 |

Table 12 Kerbside material-specific dry recycling performance – ‘Prospering Smaller Towns’ – England 2007/08

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 40 | 51 | 0 | 4 | 0 | 80 |
| Lower quartile | 69 | 105 | 6 | 34 | 6 | 169 |
| Median | 79 | 149 | 10 | 50 | 10 | 198 |
| Upper quartile | 88 | 173 | 12 | 59 | 12 | 230 |
| Maximum | 119 | 204 | 18 | 74 | 18 | 305 |
| Count | 52 | 59 | 106 | 85 | 77 | 31 |

Table 13 Kerbside material-specific dry recycling performance – ‘New and Growing Towns’ – England 2007/08

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 68 | 60 | 4 | 0 | 4 | 147 |
| Lower quartile | - | 126 | 8 | 29 | 9 | 157 |
| Median | 80 | 139 | 9 | 38 | 10 | 183 |
| Upper quartile | - | 151 | 10 | 46 | 11 | 196 |
| Maximum | 92 | 186 | 13 | 52 | 13 | 206 |
| Count | 4 | 19 | 23 | 14 | 21 | 10 |

Table 14 Kerbside material-specific dry recycling performance – ‘Prospering Southern England’ – England 2007/08

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 55 | 93 | 1 | 25 | 1 | 138 |
| Lower quartile | 81 | 134 | 6 | 44 | 10 | 213 |
| Median | 92 | 150 | 10 | 53 | 11 | 235 |
| Upper quartile | 107 | 169 | 12 | 62 | 12 | 242 |
| Maximum | 125 | 207 | 17 | 78 | 15 | 278 |
| Count | 17 | 28 | 43 | 30 | 30 | 14 |

Table 15 Kerbside material-specific dry recycling performance – ‘Coastal and Countryside’ – England 2007/08

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 45 | 53 | 1 | 1 | 0 | 96 |
| Lower quartile | 73 | 97 | 5 | 29 | 6 | 139 |
| Median | 81 | 115 | 8 | 43 | 10 | 172 |
| Upper quartile | 92 | 149 | 11 | 52 | 11 | 184 |
| Maximum | 106 | 180 | 15 | 64 | 17 | 204 |
| Count | 15 | 29 | 43 | 33 | 31 | 12 |

Table 16 Kerbside material-specific dry recycling performance – ‘Industrial Hinterlands’ – England 2007/08

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 39 | 67 | 0 | 2 | 0 | 97 |
| Lower quartile | 52 | 80 | 4 | 26 | 0 | 154 |
| Median | 61 | 92 | 6 | 28 | 4 | 155 |
| Upper quartile | 67 | 150 | 8 | 37 | 10 | 216 |
| Maximum | 84 | 171 | 13 | 49 | 12 | 239 |
| Count | 16 | 7 | 23 | 22 | 17 | 5 |

Table 17 Kerbside material-specific dry recycling performance – ‘Manufacturing Towns’ – England 2007/08

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 48 | 67 | 0 | 3 | 0 | 72 |
| Lower quartile | 63 | 104 | 8 | 34 | 6 | 177 |
| Median | 66 | 133 | 11 | 43 | 10 | 204 |
| Upper quartile | 75 | 158 | 12 | 54 | 12 | 220 |
| Maximum | 124 | 174 | 16 | 74 | 19 | 237 |
| Count | 16 | 15 | 29 | 27 | 19 | 10 |

Table 18 Kerbside material-specific dry recycling performance – ‘Inner London boroughs’ – England 2007/08

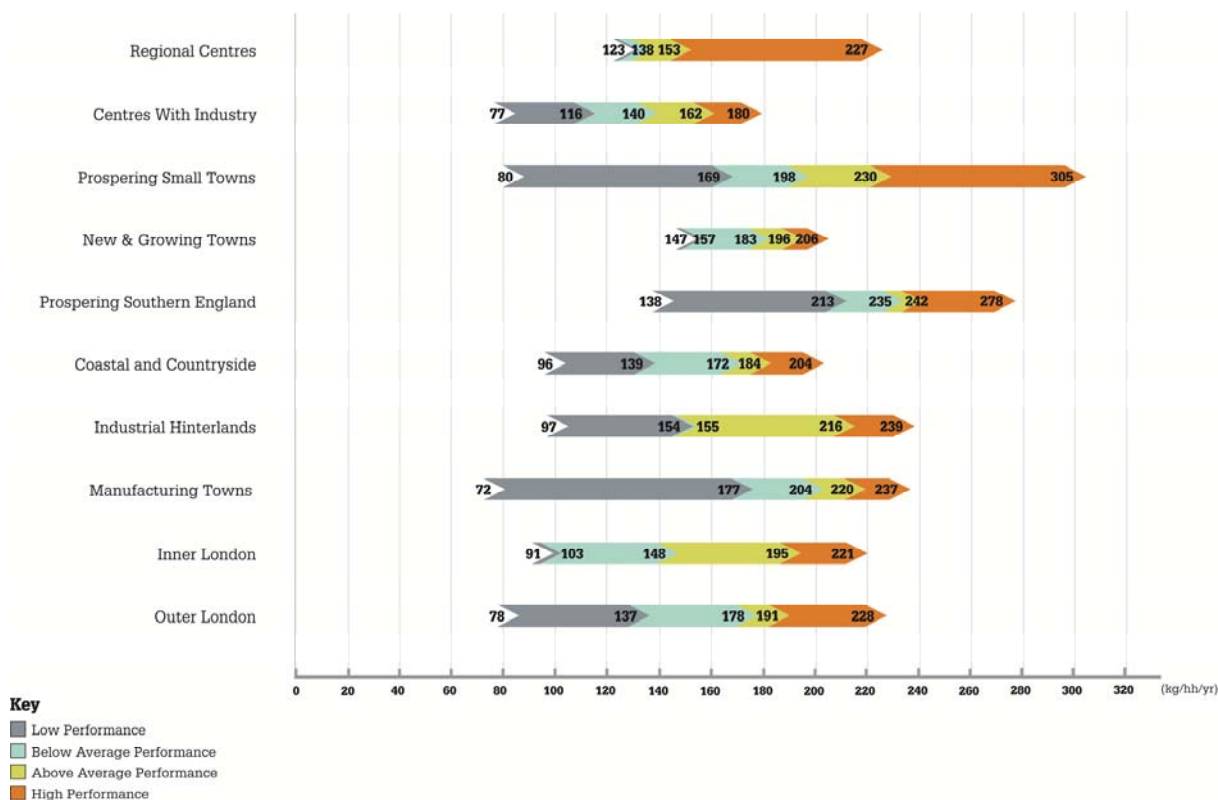
| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 50 | 61 | 2 | 21 | 2 | 91 |
| Lower quartile | - | 69 | 5 | 26 | 5 | 103 |
| Median | 50 | 98 | 7 | 35 | 6 | 148 |
| Upper quartile | - | 131 | 9 | 45 | 9 | 195 |
| Maximum | 50 | 148 | 11 | 51 | 11 | 221 |
| Count | 1 | 13 | 14 | 13 | 14 | 13 |

Table 19 Kerbside material-specific dry recycling performance – ‘Outer London boroughs’ – England 2007/08

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) | All 5 materials (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|----------------------------|
| Minimum* | 56 | 46 | 1 | 20 | 2 | 78 |
| Lower quartile | - | 88 | 4 | 33 | 5 | 137 |
| Median | 72 | 98 | 5 | 40 | 8 | 178 |
| Upper quartile | - | 126 | 9 | 45 | 10 | 191 |
| Maximum | 85 | 147 | 12 | 55 | 16 | 228 |
| Count | 4 | 15 | 19 | 17 | 16 | 12 |

Figure 4 outlines performance across these categories, based on those collecting all five materials.

Figure 4 Kerbside dry recycling performance - local authorities collecting all 5 materials, according to the ONS Local Authority Area Classification 2001 (adapted for London categories to include only Inner and Outer London classifications), England 2007/08



In summary, it is clear that local authority type and therefore demographic and socio-economic factors do play a role in influencing kerbside dry recycling performance (consistent with the results of the analyses undertaken by Icaro Consulting). Broadly speaking the more urban, less prosperous and more deprived an authority the lower their recycling performance is likely to be; and the more rural, prosperous and less deprived an authority is the higher their recycling performance is likely to be. However, this trend is most obvious at the extremes (i.e., extremely rural, extremely prospering) and these characteristics do not account for all the differences observed between authorities. Other factors must also be contributing.

5.0 Kerbside recycling service characteristics

This section investigates material-specific yields based on kerbside dry recycling service profiles. A dry recycling service profile is defined here as the combination of the dry recycling scheme and the associated residual waste scheme provided to households. As discussed under 'Methodology', dry recycling service information was successfully combined with kerbside recycling yield data for 299 (or 84%) of the 354 local authorities charged with the collection of household waste in England in 2007/08. Local authorities were included for analysis if a single kerbside dry recycling service served 90% or more of households receiving a recycling service in the authority.

Dry recycling service profiles were classified using the following criteria:

- Type of dry recycling scheme e.g. kerbside sort, single stream co-mingled, two stream co-mingled etc.
- Frequency of dry recycling collection e.g. weekly, fortnightly etc.
- Type of dry recycling container e.g. box/sack, wheeled bin etc.
- Frequency of residual waste collection e.g. weekly, fortnightly etc.

A summary of the number of authorities operating various types of dry recycling scheme based on the first of these criteria is listed in Table 20.

Table 20 Dry kerbside scheme type, England 2007/08

| Collection type | No. of LAs operating scheme |
|--------------------------|-----------------------------|
| Kerbside sort | 134 |
| Single stream co-mingled | 111 |
| Two stream co-mingled | 46 |
| Single material | 6 |
| Other | 2 |
| TOTAL * | 299 |

*Total refers to the total number of authorities included in the analysis, not the total number of authorities operating kerbside recycling schemes in England, which was 353 in 2007/08.

When the remaining three criteria were included (frequency, container and residual waste frequency) a number of different service profile types were identified. Of these, 10 service profiles were adopted by at least 10 local authorities and so could be included for service specific analysis. These 10 service profiles are listed in Table 21 and are discussed in more detail in sections 5.1 to 5.3. The total number of authorities operating one of these 10 service profiles was 246. A further six local authorities were operating a single material collection, while the remaining 47 authorities operated other, less common service profiles.

Table 21 Dry kerbside service classification, England 2007/08

| Service ID | Scheme type | Collection frequency | Collection container | Residual waste frequency | No. of LAs |
|------------|--------------------------|----------------------|------------------------|--------------------------|------------|
| 1 | kerbside sort | Weekly | box/sack | weekly | 11 |
| 2 | kerbside sort | Weekly | box/sack | fortnightly | 11 |
| 3 | kerbside sort | Fortnightly | box/sack | weekly | 65 |
| 4 | kerbside sort | Fortnightly | box/sack | fortnightly | 41 |
| 5 | single stream co-mingled | Weekly | box/sack | weekly | 18 |
| 6 | single stream co-mingled | Fortnightly | wheeled bin | weekly | 14 |
| 7 | single stream co-mingled | Fortnightly | wheeled bin | fortnightly | 46 |
| 8 | single stream co-mingled | Fortnightly | wheeled bin / box/sack | fortnightly | 10 |
| 9 | two stream co-mingled | Fortnightly | box/sack | weekly | 18 |
| 10 | two stream co-mingled | Fortnightly | box/sack | fortnightly | 12 |
| TOTAL | | | | | 246 |

It is important to note here again that the recycling yields per household have been calculated based on *the amount of material collected for recycling*. For single stream and two stream co-mingled schemes some of the material collected may be subsequently rejected during sorting at a Material Recovery Facility (MRF) before the

recyclables are sent on to the reprocessor. Results have therefore been presented here in two ways. The first is based on the total amount collected and the second – in brackets - is based on the total amount collected minus an assumed 10% rejected at the MRF (for further details see the 'Methodology' section).

5.1 Kerbside sort services

Kerbside sort systems are where materials are sorted by type at the kerbside into different compartments of a collection vehicle. One hundred and thirty four local authorities operated a kerbside sort recycling service in 2007/08, with four dominant service types evident:

- Kerbside sort, weekly collection, box/sack, weekly residual waste
- Kerbside sort, weekly collection, box/sack, fortnightly residual waste
- Kerbside sort, fortnightly collection, box/sack, weekly residual waste
- Kerbside sort, fortnightly collection, box/sack, fortnightly residual waste

NB. Lower and upper quartiles are only listed in tables 22 - 25 where five or more authorities are collecting a specific material. Where between five and 10 authorities are collecting a material lower and upper quartiles are included, but these should be treated with caution as the sample size is small. In these cases the better measures are minimum, maximum and median.

** As values are rounded to the nearest whole number, minimum values of zero may occur.*

Table 22 Kerbside sort, weekly collection, box/sack, weekly residual waste

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|
| Minimum* | 42 | 97 | 6 | 26 | 6 |
| Lower quartile | 67 | - | 6 | 46 | 6 |
| Median | 92 | 110 | 7 | 55 | 7 |
| Upper quartile | 95 | - | 8 | 61 | 8 |
| Maximum | 107 | 149 | 11 | 69 | 11 |
| Count | 7 | 4 | 10 | 11 | 10 |

Table 23 Kerbside sort, weekly collection, box/sack, fortnightly residual waste

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|
| Minimum* | 89 | 106 | 4 | 35 | 0 |
| Lower quartile | 96 | - | 9 | 54 | 2 |
| Median | 99 | 126 | 11 | 59 | 11 |
| Upper quartile | 108 | - | 12 | 61 | 13 |
| Maximum | 119 | 179 | 13 | 65 | 18 |
| Count | 6 | 4 | 10 | 10 | 10 |

Table 24 Kerbside sort, fortnightly collection, box/sack, weekly residual waste

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|
| Minimum* | 40 | 57 | 1 | 18 | 0 |
| Lower quartile | 63 | 97 | 5 | 27 | 3 |
| Median | 73 | 108 | 6 | 36 | 5 |
| Upper quartile | 86 | 114 | 8 | 47 | 8 |
| Maximum | 124 | 124 | 13 | 71 | 13 |
| Count | 49 | 16 | 63 | 65 | 25 |

Table 25 Kerbside sort, fortnightly collection, box/sack, fortnightly residual waste

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|
| Minimum* | 50 | 77 | 3 | 21 | 0 |
| Lower quartile | 70 | 87 | 7 | 39 | 6 |
| Median | 84 | 95 | 10 | 50 | 10 |
| Upper quartile | 88 | 108 | 13 | 58 | 11 |
| Maximum | 125 | 152 | 18 | 78 | 19 |
| Count | 24 | 17 | 41 | 41 | 23 |

5.2 Single stream co-mingled services

Single stream co-mingled systems are where materials are collected in a single compartment vehicle with the sorting of the materials occurring at a Materials Recovery Facility (MRF). One hundred and eleven local authorities operated a single stream co-mingled recycling service in 2007/08, with four dominant service types evident:

- Single stream co-mingled, weekly collection, box/sack, weekly residual waste
- Single stream co-mingled, fortnightly collection, wheeled bin, weekly residual waste
- Single stream co-mingled, fortnightly collection, wheeled bin, fortnightly residual waste
- Single stream co-mingled, fortnightly collection, wheeled bin or box/sack, fortnightly residual waste

NB. Lower and upper quartiles are only listed in tables 26 – 29 where five or more authorities are collecting a specific material. Where between five and 10 authorities are collecting a material lower and upper quartiles are included, but these should be treated with caution as the sample size is small. In these cases the better measures are minimum, maximum, and median.

* As values are rounded to the nearest whole number, minimum values of zero may occur.

Table 26 Single stream co-mingled, weekly collection, box/sack, weekly residual waste (brackets indicate an assumed 10% MRF reject rate)

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|
| Minimum* | 50 (45) | 60 (54) | 1 (1) | 0 (0) | 1 (1) |
| Lower quartile | - | 106 (96) | 8 (7) | 36 (32) | 8 (7) |
| Median | 65 (59) | 131 (118) | 9 (9) | 42 (38) | 10 (9) |
| Upper quartile | - | 161 (145) | 11 (10) | 45 (40) | 11 (10) |
| Maximum | 81 (73) | 190 (171) | 13 (12) | 57 (51) | 13 (12) |
| Count | 2 | 16 | 18 | 10 | 18 |

Table 27 Single stream co-mingled, fortnightly collection, wheeled bin, weekly residual waste (brackets indicate an assumed 10% MRF reject rate)

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|
| Minimum* | n/a | 79 (71) | 5 (4) | 16 (15) | 5 (4) |
| Lower quartile | n/a | 117 (105) | 8 (8) | 41 (37) | 8 (7) |
| Median | n/a | 134 (120) | 10 (9) | 44 (39) | 10 (9) |
| Upper quartile | n/a | 148 (134) | 10 (9) | 49 (44) | 10 (9) |
| Maximum | n/a | 152 (137) | 11 (10) | 52 (47) | 11 (10) |
| Count | n/a | 14 | 14 | 7 | 14 |

Table 28 Single stream co-mingled, fortnightly collection, wheeled bin, fortnightly residual waste (brackets indicate an assumed 10% MRF reject rate)

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|
| Minimum* | 72 (65) | 94 (84) | 5 (4) | 1 (1) | 5 (5) |
| Lower quartile | - | 154 (138) | 11 (9) | 9 (8) | 11 (10) |
| Median | 72 (65) | 167 (150) | 11 (10) | 48 (43) | 12 (10) |
| Upper quartile | - | 176 (159) | 12 (11) | 54 (48) | 12 (11) |
| Maximum | 72 (65) | 207 (186) | 15 (14) | 70 (63) | 15 (14) |
| Count | 2 | 44 | 46 | 14 | 46 |

Table 29 Single stream co-mingled, fortnightly collection, wheeled bin or sack/box, fortnightly residual waste (brackets indicate an assumed 10% MRF reject rate)

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|
| Minimum* | n/a | 151 (136) | 10 (9) | 43 (39) | 10 (9) |
| Lower quartile | n/a | 161 (145) | 11 (10) | 45 (41) | 11 (10) |
| Median | n/a | 176 (159) | 12 (11) | 49 (44) | 12 (11) |
| Upper quartile | n/a | 189 (170) | 13 (12) | 60 (54) | 13 (12) |
| Maximum | n/a | 200 (180) | 14 (13) | 64 (58) | 14 (13) |
| Count | n/a | 10 | 10 | 6 | 10 |

5.3 Two stream co-mingled services

Two stream partially co-mingled systems are where residents are required to separate materials into two categories, usually fibres (paper/card) and containers (cans, glass, plastic). Separate containers are provided for each category, the contents of which are loaded into separate compartments on a twin compartment collection vehicle. Forty six local authorities operated a two stream co-mingled recycling service in 2007/08, with two dominant service types evident:

- Two stream co-mingled, fortnightly collection, box/sack, weekly residual waste
- Two stream co-mingled, fortnightly collection, box/sack, fortnightly residual waste

NB. Lower and upper quartiles are only listed in tables 30 – 31 where five or more authorities are collecting a specific material. Where between five and 10 authorities are collecting a material lower and upper quartiles are included, but these should be treated with caution as the sample size is small. In these cases the better measures are minimum, maximum, and median.

* As values are rounded to the nearest whole number, minimum values of zero may occur.

Table 30 Two stream co-mingled, fortnightly collection, box/sack, weekly residual waste (brackets indicate an assumed 10% MRF reject rate)

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|
| Minimum* | 39 (35) | 46 (42) | 1 (1) | 16 (15) | 0 (0) |
| Lower quartile | 56 (50) | 92 (83) | 4 (4) | 28 (25) | 1 (1) |
| Median | 64 (58) | 128 (116) | 7 (6) | 41 (37) | 6 (5) |
| Upper quartile | 68 (61) | 143 (129) | 10 (9) | 45 (40) | 10 (9) |
| Maximum | 90 (81) | 161 (145) | 12 (10) | 56 (51) | 12 (10) |
| Count | 10 | 8 | 17 | 15 | 16 |

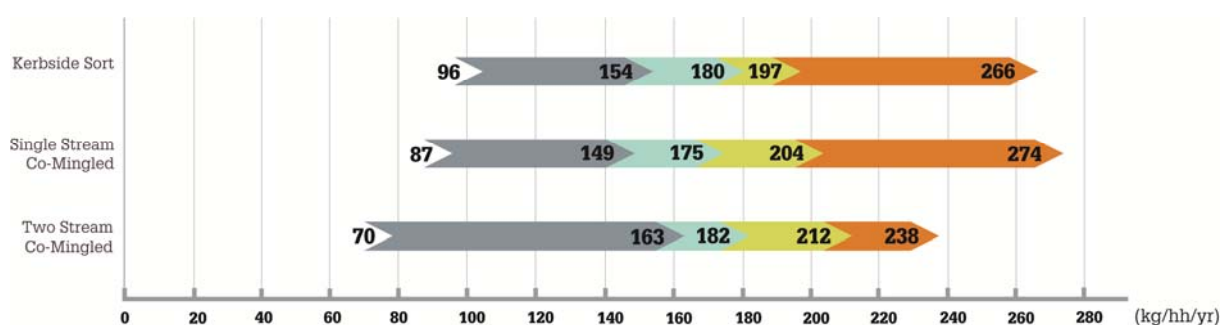
Table 31 Two stream co-mingled, fortnightly collection, box/sack, fortnightly residual waste (brackets indicate an assumed 10% MRF reject rate)

| | Paper without card (kg/hh/yr) | Paper & card (kg/hh/yr) | Cans (kg/hh/yr) | Glass (kg/hh/yr) | Plastic (kg/hh/yr) |
|----------------|-------------------------------|-------------------------|-----------------|------------------|--------------------|
| Minimum* | 73 (66) | 93 (83) | 5 (4) | 42 (38) | 0 (0) |
| Lower quartile | - | 117 (105) | 7 (6) | 46 (41) | 10 (9) |
| Median | 86 (77) | 130 (117) | 11 (9) | 53 (48) | 11 (10) |
| Upper quartile | - | 144 (130) | 12 (11) | 60 (54) | 13 (11) |
| Maximum | 105 (94) | 184 (166) | 15 (14) | 70 (63) | 15 (14) |
| Count | 4 | 8 | 12 | 8 | 8 |

5.4 Overview of kerbside recycling services

Figure 5 summarises performance for each kerbside dry recycling scheme type among those local authorities collecting all 5 materials (92 in total). The chart refers to the overall scheme type only and does not include the other service characteristics such as frequency of recycling collection, recycling container and frequency of residual waste collection. Taking the assumed 10% rejection of material collected via single stream and two stream co-mingled schemes into account, there is in fact no statistically significant difference between the performances of the three schemes (at a 95% confidence level).

Figure 5 Kerbside recycling performance - local authorities collecting all 5 materials, according to the type of kerbside scheme (assuming a 10% MRF rejection rate for single stream and two stream co-mingled schemes), England 2007/08



Key

- Low Performance
- Below Average Performance
- Above Average Performance
- High Performance

There is a lot of variation in material specific recycling performance across all dry recycling service profiles. In general those authorities offering a fortnightly collection of residual waste perform better than those offering a weekly residual waste collection, irrespective of dry recycling scheme type. Frequency of recycling collections alone, on the other hand, does not play a dominant role in determining recycling performance, but it does *in conjunction* with other service characteristics. Weekly kerbside sort schemes generally perform better than fortnightly schemes, in particular when residual waste collection is fortnightly. It was not possible to make the

same comparison for single stream or two stream co-mingled schemes as almost all schemes included in the analysis are fortnightly recycling.

It was found that container type alone is not a good indication of variation in performance (rather it is the service profile overall as well as a number of socio-economic factors and local authority type that influence recycling performance). This is because container type is largely a function of the collection schemes discussed in Section 3 - for example, kerbside sort and two stream co-mingled schemes used boxes and/or sacks while the majority of single stream co-mingled schemes analysed here used wheeled bins. When container type is combined with recycling and residual waste frequency to give an indication of overall recycling capacity, weekly box schemes with fortnightly residual waste collection performed similarly to fortnightly wheeled bin schemes with fortnightly residual waste collection and as stated previously these were generally the better performing services.

**Waste & Resources
Action Programme**

The Old Academy
21 Horse Fair
Banbury, Oxon
OX16 0AH

Tel: 01295 819 900
Fax: 01295 819 911
E-mail: info@wrap.org.uk

Helpline freephone
0808 100 2040

www.wrap.org.uk/local_authorities

