

Using evidence to shape better services



Desktop Textile Waste Study & Compositional Analysis

Oakdene Hollins

December 2008

Wastes &
resources
management



Community
safety &
neighbourhood
policing



Sure Start
& Children's
Centres



Affordable
housing



Healthy
communities



Local
Authority
research &
evaluation

Active citizens
& customer
research





Oakdene Hollins Desktop Textile Waste Study & Compositional Analysis

Our reference: 08138

**December 2008 &
January 2009**



Preface

As part of a wider ranging survey of the quantity and quality of textile waste being disposed of to landfill; M·E·L Research was commissioned to undertake a desktop study of textile waste concentrations within household and HWRC residual waste streams. M·E·L has undertaken hundreds of Local Authority household waste composition studies over the past ten years. The majority of household waste projects include primary and secondary categories on textile materials. As a consequence there is an in-depth library of information on textile arisings throughout the country by both geographical area and socio-demographic profiling. This data can be brought together to give a good insight into the types and quantities of textile materials thrown away by residents nationally.

This desktop study looked back over previous Local Authority residual waste and HWRC general waste data gathered since 1999. From this data it would be possible to show the amounts of Kerbside residual waste generated and also the concentrations of textile waste within it. Most household waste data is demographically classified and any significant differences would be highlighted. In addition to household data, the concentrations of textile waste surveyed at Household Recycling Centre's would also be recorded.

M·E·L Research also conducted an additional compositional analysis survey centred on the quality of textile waste being disposed of in the residual waste stream. This area was seen as an evidence gap that was identified by Oakdene Hollins in the 2006 Defra WS Project WRT152 'Recycling of Low Grade Clothing Waste.' As a result M·E·L Research will assess the suitability of clothing and textiles recovered for reuse or recycling. This analysis was performed on Kerbside waste gathered throughout Birmingham.

December 2008

First Published 2008

Printed in Great Britain by M·E·L Research Limited

8 Holt Court

Aston Science Park Birmingham B7 4AX

© M·E·L Research Limited 2008

Quality guarantee

Title	Desktop Textile Waste Study & Compositional Analysis
Client	Oakdene Hollins
Project number	08138
Report number	01
Revision number	1
Project team	Darren Coss (Senior Waste Consultant) Philip Wells (Project Manager)
Author	Philip Wells

M·E·L Research
8 Holt Court
Aston Science Park
Birmingham B7 4AX

Tel: 0121 604 466
Fax: 0121 604 6776
Email: info@m-e-l.co.uk
www.m-e-l.co.uk



Contents

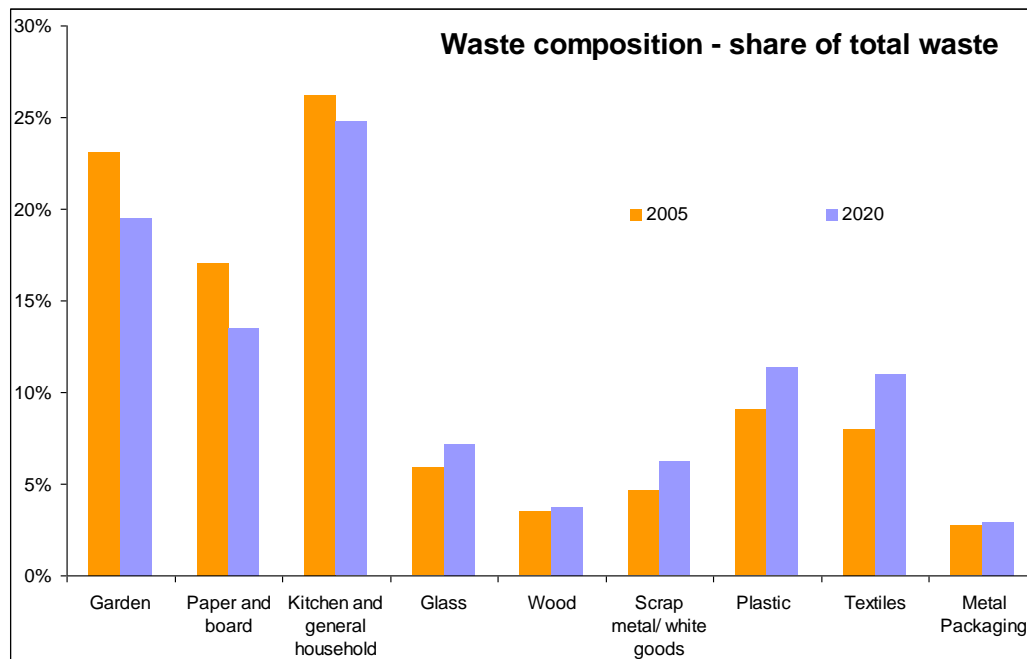
Preface	i
Quality guarantee	iii
Contents.....	v
1. Introduction	1
1.1 Background	1
1.2 Desktop Survey	2
2: Desktop Study Results.....	7
2.1 Household Residual Waste	7
2.2 HWRC Residual Waste	11
3: Compositional Analysis of Residual Kerbside Waste	13
3.1 Kerbside Collected Residual Waste.....	13
3.2 Textile Content of Residual Waste	15

1. Introduction

1.1 Background

The consumption and disposal rate of clothing and textiles has increased dramatically in recent years, particularly driven by the advent of 'fast' or 'discount' fashion^{1,2,3}. In fact, the total share of clothing and textiles waste is forecast as the fastest growing household waste stream from 2005 to 2020 as illustrated in Figure 1.

Figure 1.1: Household waste composition in 2005 and 2020 split by waste category



Source: Maunder, A. et al (2006) 'Modeling the Impact of Lifestyle Changes on Household Waste Arisings.'

Previous research completed for Defra in 2006¹ highlighted that approximately 1.5 to 2 million tonnes of clothing and textiles waste is generated in the UK each year, of which 1.2 million tonnes (63%) is currently disposed of to landfill. Reuse and recycling of clothing and textiles is currently in place in the UK, although it is operating on a relatively small scale with only around 16% (300,000 tonnes) of End-of-Life clothing and textiles reused or recycled at present¹. However, there is a relatively high economic value associated with clothing when compared to other waste streams, such as plastics.

Although recent studies, including those identified above by ERM, University of Cambridge and Oakdene Hollins, have provided much needed evidence on the scale and impacts of

¹ 2006 WS Project WRT152 "Recycling of Low Grade Clothing Waste" Oakdene Hollins Ltd, SATCoL, NIRI for Defra

² 2006 Biffaward Project "Well Dressed" University of Cambridge

³ 2007 "Mapping of Evidence on Sustainable Development Impacts that Occur in the Life Cycles of Clothing" ERM for Defra

End-of-Life clothing and textiles there is still a distinct lack of evidence on the opportunities in terms of recycling and reuse channels and technologies and the feasibility of end markets and products. In order to support a growth in clothing and textiles recycling and reuse, a supporting infrastructure with the necessary capacity and end market demand must exist in the UK. Diversity in processing methods and products is also very important for the success of the industry⁴.

Clothing and textile products are composed of natural (e.g. cotton, hemp and wool) and synthetic (e.g. polyester, nylon and polypropylene) materials, usually in mixed blends to improve technical and aesthetical performance, feel and appearance. The disposal routes and processing technologies for each of these material categories vary immensely and depend on the demand for second-hand garments and recyclates.

Another evidence gap is research on recycling and reuse of commercial and household textiles. It is likely that the technologies and markets available for carpet recycling will be transferrable to the clothing recycling industry. However, a much more comprehensive and detailed study and assessment is required in order to assess the reuse and recycling options for both clothing garments and textile products.

Interventions to increase reuse and recycling rates are in existence. With clothing identified as an 'environmentally challenging' product by the UK Government it is now a priority material in the Defra Waste Strategy. This research project forms part of the evidence base for Defra's Sustainable Consumption and Production (SCP) programme and will identify the opportunities for maximizing reuse and recycling of waste clothing and textiles generated in the UK.

1.2 Desktop Survey

M·E·L Research has an archive of compositional waste data from numerous Local Authorities. Information on the types and quantities of residual waste entering landfill from Kerbside and HWRC sources is available from a wide geographic and demographic spectrum within the UK. For the basis of this survey data back to 1999 was used to identify the general disposal rates for Kerbside residual waste and the concentrations of textile waste within it. Most household's surveys require the demographic identification of resident groups within the sample.

It is commonly accepted that the types and quantities of waste that households produce is directly related to their socio economic group and specifically spending power. Similarly, whether there are children within a household and the age of the children will also have a

⁴ Wang, Y. (2007) An Environmental Perspective on Fiber Recycling: Japan

direct effect on quantities and types of waste and levels of recycling and participation in Kerbside schemes.

The Acorn classification system used is based on 2001 census data which is regularly updated. In study data used up to 2004 the profile it produced sorted households into six broad categories A to F with A broadly being the most affluent householders and F the least affluent. For data since this date the system was upgraded and classifies households on a rating of between 1 and 5; again with 1 broadly being the most affluent householders and 5 the least affluent. The table below gives a brief description of each category and its associated groups.

Table 1.1: ACORN categories and groups (Based on 2001 census data)

ACORN Categories	ACORN Group
1 - Affluent Achievers	1.A - Wealthy Executives 1.B - Affluent Greys 1.C - Flourishing Families
2 - Urban Prosperity	2.D - Prosperous Professionals 2.E - Educated Urbanites 2.F - Aspiring Singles
3 - Comfortably Off	3.G - Starting Out 3.H - Secure Families 3.I - Settled Suburbia 3.J - Prudent Pensioners
4 - Modest Means	4.K - Asian Communities 4.L - Post Industrial Families 4.M - Blue Collar Roots
5 - Hard Pressed	5.N - Struggling Families 5.O - Burdened Singles 5.P - High Rise Hardship 5.Q - Inner City Adversity

Acorn 1 'Affluent Achievers'

The UK national average for this Acorn Category is 23.3%. These householders are the most affluent. They are described as: Wealthy Executives; Flourishing Families and Affluent Greys (mature couples). Generally the Affluent Greys are the best recyclers as they have the time and lifestyle to be involved in environmental projects.

The waste from Acorn 1 households is rich in newspapers and magazines; they often have two newspapers daily, they may work from home producing a great deal more recyclable paper. They also dispose of large quantities of non-recyclable but compostable paper e.g. kitchen roll. They eat large amounts of fresh fruit and vegetables and so often have a great deal of kitchen compostable waste e.g. vegetable peelings, they have large

gardens and often do not home compost, sometimes the gardener takes it away. Making use of cling film and the freezer they waste very little food. The majority of their glass containers are green and mainly wine bottles. They buy very little packaged food e.g. bottled and canned food. Compared to other Acorn categories they have very few drink bottles opting for fruit juice in cartons rather than squash or fizzy drinks. Their waste is rich in recyclable material, but, aside from the Affluent Greys, they are often not the best recyclers.

Waste awareness campaigns carried out over the last two years have shown that the top end of these households are becoming increasingly disassociated from their waste as they make more use of cleaners, cooks and butlers.

Acorn 2 'Urban Prosperity'

Acorn 2 households make up 13.3% of UK households. This category is divided into three broad Groups: Prosperous Professionals; Educated Urbanites and Aspiring Singles.

These households are best summed up as city dwellers often broadsheet newspaper readers couples or singles they can be extremely affluent or poor and idealistic. Prosperous Professional and Aspiring Singles are unsettled households and they often have the least space in their homes for storing recycling, if they even remember what the system is.

Acorn 2 households often do not dispose of great weights of waste. They eat out a lot or don't eat well at all. Waste can be typified by instant meal for one packaging and other convenience packaged foods. If they have gardens they are small and low maintenance with decking and pebbles rather than grass and weeds.

Acorn 3 'Comfortably Off'

There are two distinct ends for this Acorn Category. Firstly, the retired couples. These households usually produce the least amount of waste and they are very good at recycling. They have good participation rates and will put as much as they can into the scheme. You will lose some recyclables to their re-use schemes i.e. they wrap their vegetable peelings in newspaper, take the magazines to the doctor's surgery and use plastic bottles to cover seedlings.

The other end of the Acorn 3 Category involves children, and households with children produce a lot of waste. Crisp packets, fizzy drink bottles discarded toys and clothes – these parents are comfortably off and are happy to please their children. They can be disinterested recyclers. They are comfortable so they are open to other issues, but they

have worked hard to get where they are and often feel it is not their job to separate materials for recycling.

The average for the UK is 28.1%.

Acorn 4 'Moderate Means'

The UK average for 'moderate means' households is 13.2%. These households are often seen to dispose of the greatest amounts of waste. Participation in Kerbside recycling schemes is similar to the Acorn 2 households but with fewer newspapers, magazines and even less garden waste. Despite the large amounts of potentially recyclable material in their waste it is difficult to persuade these households to recycle. Green issues are often afforded a low priority in their lives; as such schemes to improve recycling have to be aimed at something more real to them i.e. linked to neighbourhood improvements, particularly for children.

Acorn 5 'Hard Pressed'

These are the least affluent households and often the worst recyclers, although they also have the least amount of waste that could be described as potentially recyclable. The opposite of an Acorn 1, these households dispose of a lot of clear glass, food and drink cans and PET fizzy drink bottles. They buy less expensive food products, often with shortened shelf lives or buy one get one free which results in large quantities of kitchen waste both cooked and prepared and raw fruit and vegetables.

The 'Struggling Families' often produce the greatest weight of waste and will often produce the largest amount of contamination in the recycling. The national average for this type of household is 21.7%.

Most of the Kerbside waste surveys contain information on the ACORN profile of the target sample. Earlier surveys are less detailed in the sub-categories of textile waste that they identify and many more recent surveys may be more or less detailed depending upon their initial requirements. The way in which residual waste is classified by analysts is continually evolving and whereas some surveys may identify only the presence of 'Textiles', 'Natural Fibres' or 'Man-made Fibres'; more recent projects may distinguish between reusable clothes, shoes, flat material, stuffed materials and rags.

Bulkier waste from HWRC sites usually distinguishes between textiles and shoes as well as giving indications of heavier textiles such as carpet waste. For household waste this study will show the changes in the volume of residual waste since 1999 by annual averages and also (where applicable) by resident demographic. Against this the overall

concentration of textile waste as a proportion will be shown; again where applicable the levels of reusable textiles and shoes within the textile element can be highlighted.

For HWRC residual waste the concentration of overall textiles can be shown from all available surveys since 1999. In addition the proportion of textile waste that is contributed by carpet materials can be shown.

2: Desktop Study Results

2.1 Household Residual Waste

This section details results obtained from household residual waste surveys taken between 1999 – 2008. Results will show average kg/hh/wk of residual waste, percentage concentration of total textile waste and proportion of reusable textiles (where available). Data can be expressed as annual averages (all results) and where applicable by ACORN category.

Table 2.1: Average Kerbside Residual Waste Generation Rates By Acorn 1999 – 2008.

ACORN CATEGORY	KG/HH/WK HOUSEHOLD RESIDUAL WASTE BY YEAR										ACORN AVERAGE
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	
A	11.36	18.02	14.45	16.90	13.95	16.70	10.87				14.61
B	11.77	20.18	13.15	17.32	14.73						15.43
C		18.45		11.78	12.54	12.41					13.79
D	20.80	19.44	12.74	15.15	13.15	10.71	16.87				15.55
E	7.04	23.71	13.37	13.89	13.89	8.44	6.91				12.46
F	20.60	19.86	15.09	16.98	14.89	9.40	4.20				14.43
ACORN CATEGORY	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ACORN AVERAGE
1						12.26	12.00	9.36	8.98	8.74	10.27
2						9.23	13.84	13.33	9.79	10.13	11.26
3						9.92	11.74	9.85	9.51	9.76	10.15
4						10.06	11.66	11.98	11.53	9.09	10.86
5						15.24	14.57	11.97	10.26	11.06	12.62
ANNUAL AVERAGE	14.31	19.94	13.76	15.34	13.86	11.44	11.41	11.30	10.01	9.75	

Table 2.2: Average Textile Concentrations Within Kerbside Residual Waste By Acorn 1999 – 2008.

ACORN CATEGORY	HOUSEHOLD RESIDUAL WASTE BY YEAR (%)										ACORN AVERAGE
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	
A	1.58%	2.10%	2.93%	1.76%	2.43%	2.33%	2.50%				2.23%
B	2.05%	2.04%	2.51%	3.12%	3.52%						2.65%
C		3.04%		3.81%	2.24%	3.08%					3.04%
D	5.63%	4.39%	4.77%	3.95%	3.75%	3.11%	3.81%				4.20%
E	2.25%	2.28%	3.25%	3.61%	6.29%	2.91%	6.95%				3.93%
F	4.03%	6.25%	4.69%	4.65%	4.65%	10.23%	9.37%				6.27%
ACORN CATEGORY	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ACORN AVERAGE
1						2.95%	3.40%	3.01%	3.28%	3.65%	3.26%
2						2.95%	4.50%	3.36%	3.64%	2.43%	3.37%
3						3.15%	4.00%	4.42%	3.30%	4.05%	3.78%
4						4.49%	4.38%	3.47%	4.46%	5.31%	4.42%
5						5.62%	4.31%	4.44%	4.49%	4.70%	4.71%
ANNUAL AVERAGE	3.11%	3.35%	3.63%	3.48%	3.81%	4.08%	4.80%	3.74%	3.83%	4.03%	

Figure 2.1: Average Kerbside Residual Waste Generation Rates & Textile Concentrations By Acorn 1999 – 2008.

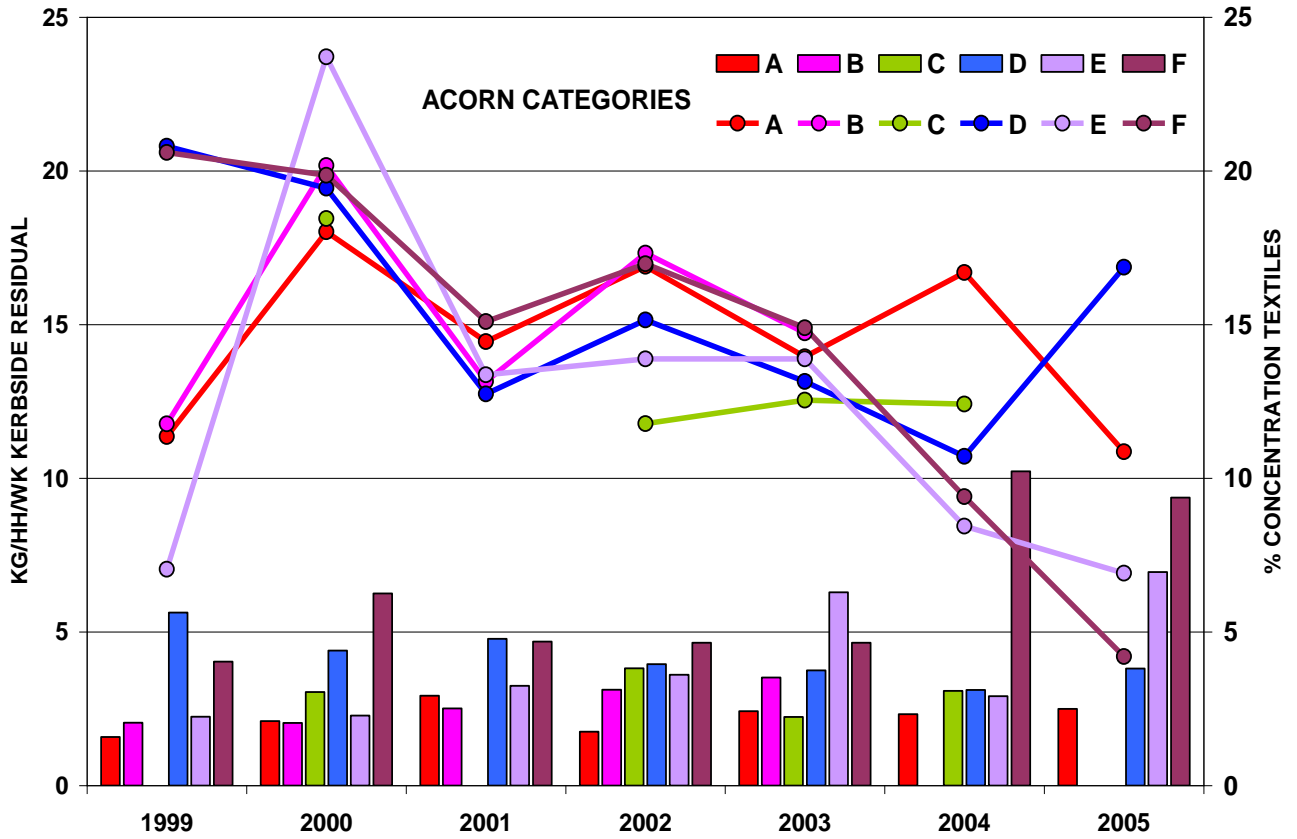
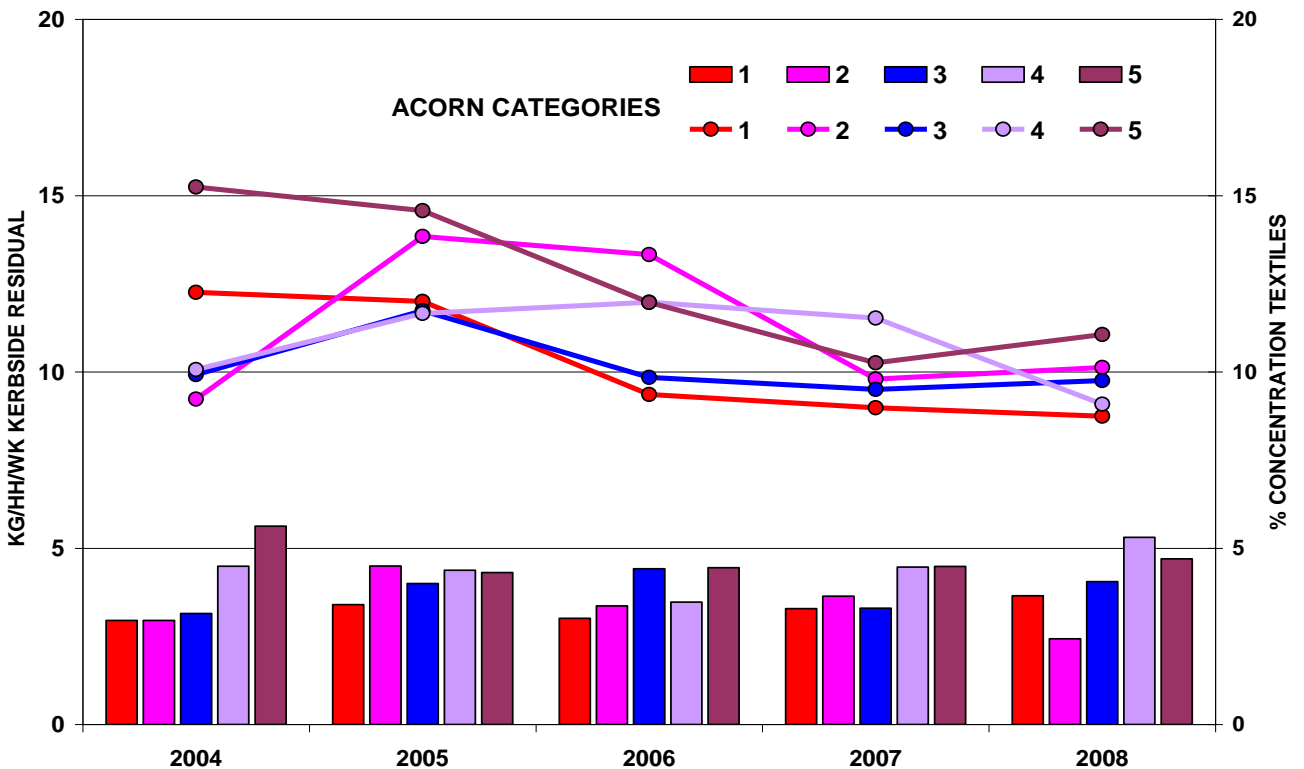


Figure 2.2: Average Kerbside Residual Waste Generation Rates & Textile Concentrations By Acorn 1999 – 2008.



From Tables 2.1, 2.2 and Figures 2.1, 2.2 it is seen that average Kerbside waste levels (line trace) have generally reduced since 2000 from around 20kg/hh/wk to around 10kg/hh/wk. Acorn 5 households tend to generate the most waste and are averaging 12.62kg/hh/wk since 2004 compared with 10.15kg/hh/wk for Acorn 3.

The bar chart shows the average concentrations of textiles seen within each Acorn between 1999 – 2008. Average levels are seen to be fairly steady at between 3.1% and 4.8% of total residual waste. It is noticeable that when looking at earlier (Acorn A – F) and more recent (Acorn 1 – 5) surveys it is the less affluent households that seem to have the highest proportions of textiles in their residual waste. So not only are Acorn 5 households currently seen to be the highest generators of residual waste they are also disposing of waste with the highest proportion of textiles. Since 2004, Acorn 5 households average 12.62kg/hh/wk at 4.71% textiles; this represents around 0.59kg/hh/wk of textiles. In comparison Acorn 1 households average 10.27kg/hh/wk at 3.26% textiles; this represents around 0.33kg/hh/wk of textiles.

Table 2.3: Average Annual Kerbside Residual Waste Levels & Textile Waste Concentrations 1999 – 2008.

ALL DATA BY YEAR		
ACORN	AVG KG/HH/WK TOTAL WASTE	AVG % TEXTILE WASTE
1999	12.57	2.83%
2000	14.98	3.34%
2001	13.87	3.61%
2002	16.37	3.63%
2003	14.04	4.14%
2004	11.22	3.72%
2005	12.94	4.13%
2006	10.70	3.80%
2007	9.86	3.79%
2008	9.54	4.10%

Table 2.3 above shows annual residual waste and textile concentration levels since 1999. This table combines all household data including those not classified by Acorn category. This table and Figure 2.3 clearly show the gradual decrease in the amount of Kerbside residual waste (blue trace). Concentrations of textile waste appear to be slightly higher since 2004 and are shown in the bar chart. Where data was available to distinguish between reusable shoes and clothes and other forms of textiles then this data could be shown separately. From the chart some bars are split to show the proportions of reusable textiles within the textile fraction as a whole. This is summarized in table 2.4.

On the whole concentrations of textile waste within household residual waste have risen slightly. Conversely the proportion of these textiles that are classed as reusable clothes and shoes has fallen from 55% in 2005 to 43% in 2008. A level of 60% was recorded in 2000.

Figure 2.3: Average Kerbside Residual Waste Generation Rates & Textile Concentrations All Data 1999 – 2008.

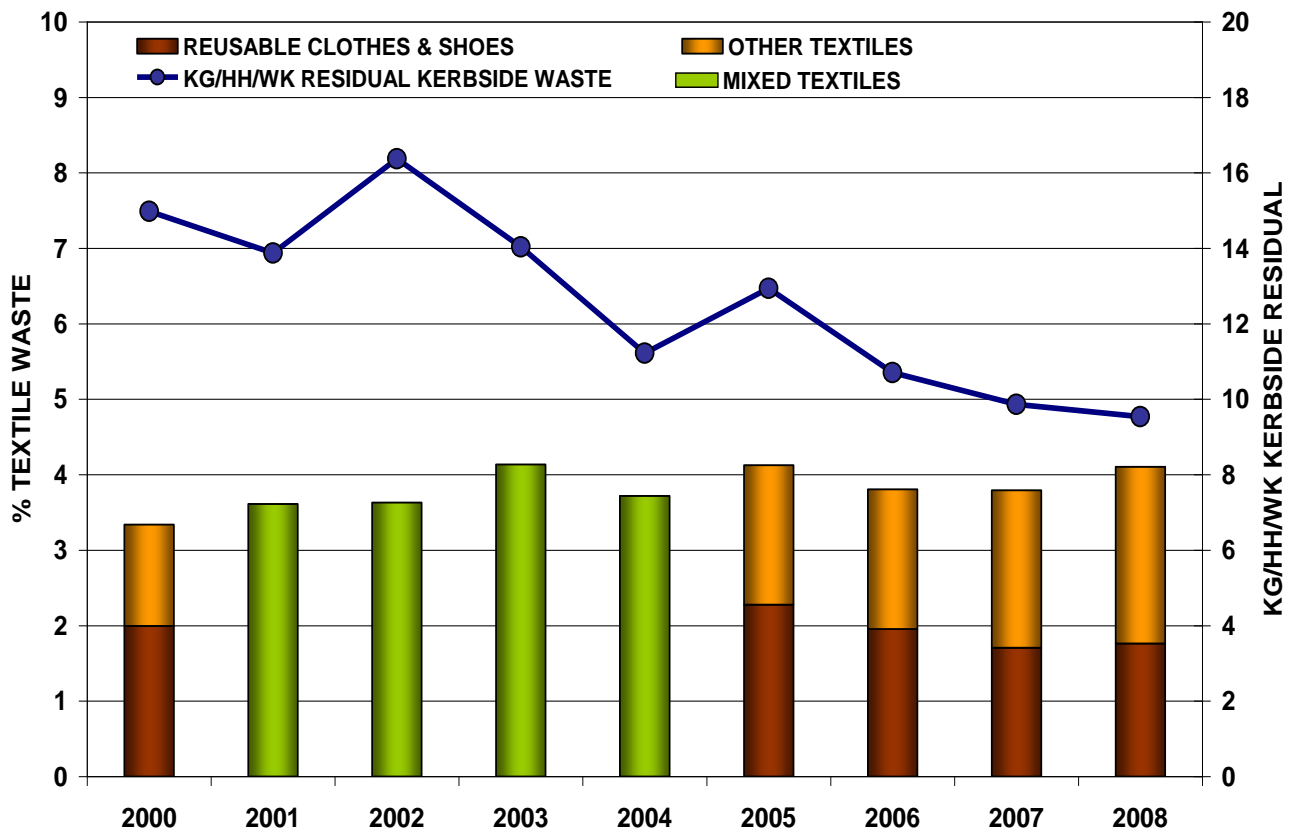


Table 2.4: Average Annual Kerbside Residual Waste Levels & Textile Waste Concentrations 1999 – 2008.

YEAR	CONTRIBUTION OF TEXTILES TO RESIDUAL WASTE	PROPORTION OF TEXTILES AS REUSABLE CLOTHING & SHOES
2000	3.34%	59.79%
2005	4.13%	55.21%
2006	3.80%	51.42%
2007	3.79%	44.99%
2008	4.10%	43.00%

2.2 HWRC Residual Waste

This section details results obtained from general waste containers sampled between 1999 – 2008. Results will show percentage concentration of total textile waste and the overall proportion of carpet waste (where available). Data will be expressed as annual averages (all results).

Table 2.5: Average Kerbside Residual Waste Generation Rates By Acorn 1999 – 2008.

YEAR	AVG % TEXTILE WASTE	AVG % CARPET PROPORTION
1999	4.48%	NO DATA
2000	2.27%	NO DATA
2001	1.33%	NO DATA
2002	7.22%	66.59%
2003	13.28%	NO DATA
2004	15.34%	70.57%
2005	13.99%	75.15%
2006	12.71%	76.30%
2007	9.94%	63.14%
2008	17.57%	65.32%

Figure 2.4: Average Kerbside Residual Waste Generation Rates By Acorn 1999 – 2008.

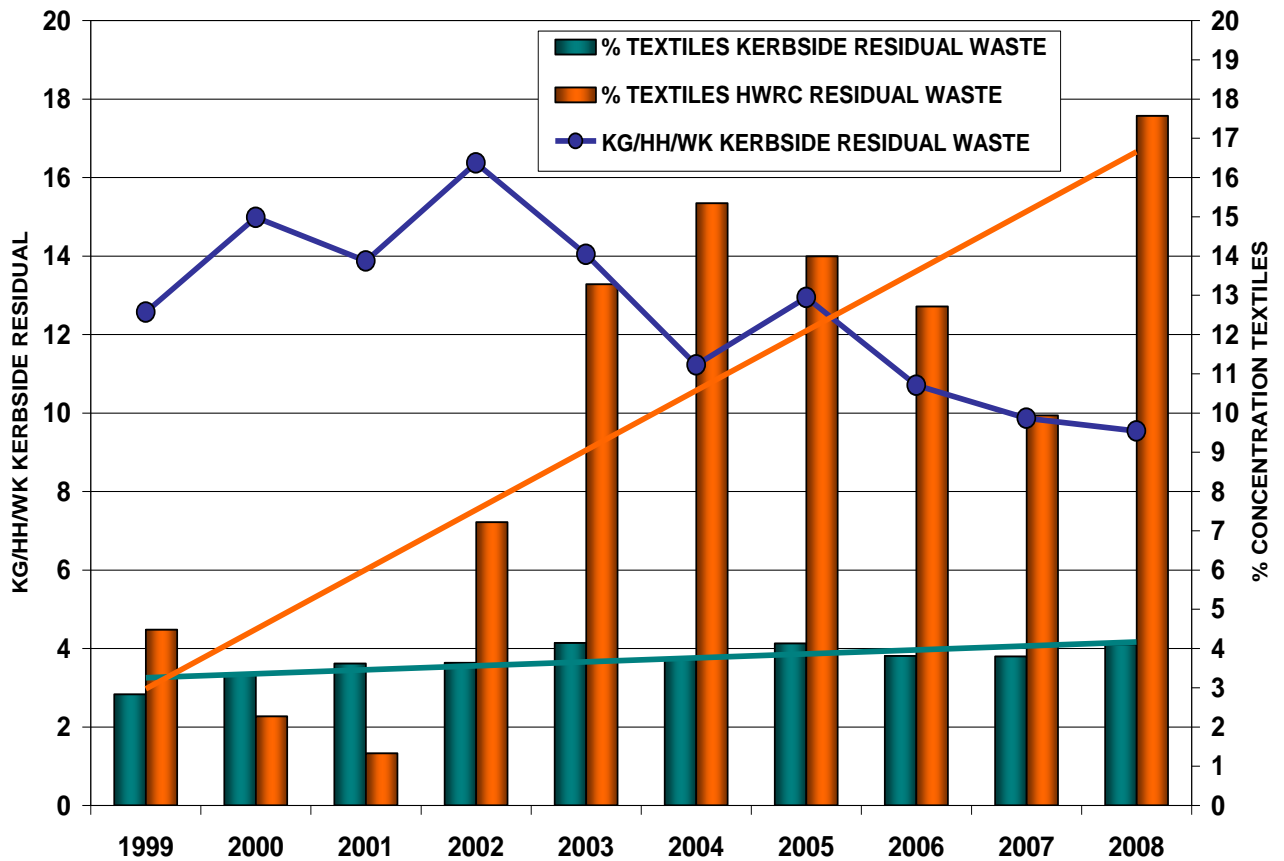
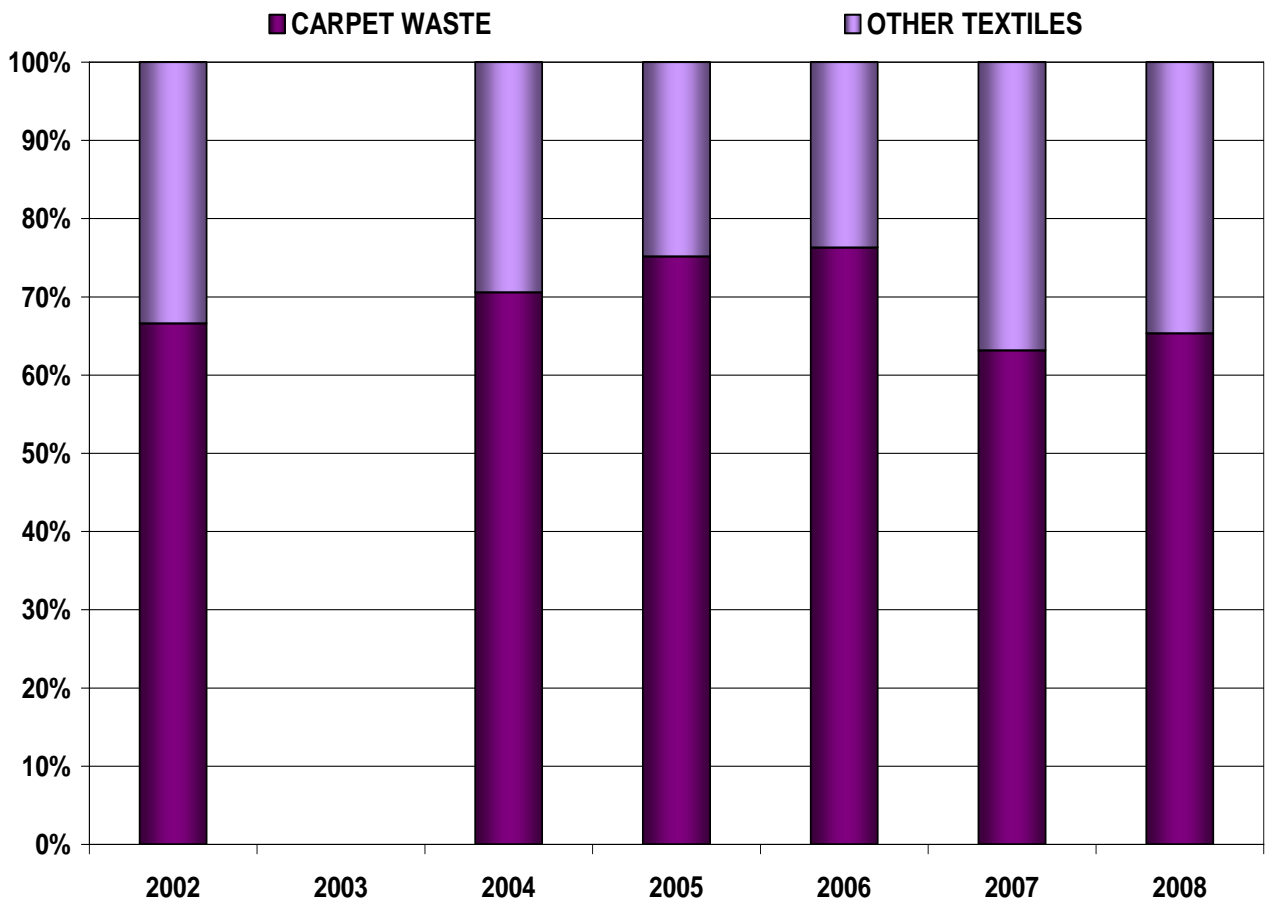


Table 2.5 and Figure 2.4 show the changing concentrations of textile waste within HWRC residual waste (orange bars). For reference the concentrations of textiles in households residual waste (green bars) and the overall levels of household residual waste (blue trace) are also shown. Whereas levels of household residual waste are falling we have seen that concentrations of textiles within this waste are fairly steady, showing only a small indication that they are increasing. In contrast the concentration of textile waste in residual containers at HWRC sites is not only far greater than for household waste, it seems to have risen sharply since 2001. However even though the most recent 2008 figures show average concentrations of over 17.5%, concentrations actually fell from 15.3% to 9.9% in the previous 4 consecutive years.

Other than mattresses and upholstered furniture (which are very heavy and were not included in this study) it is often seen to be the case that carpet materials form the bulk of total textile waste seen. From Table 2.5 and Figure 2.5 it is seen that between two thirds and three quarters of textile waste in residual skips tends to originate from carpet waste.

Figure 2.5: Average Proportion of Carpet Waste Within HWRC Textiles 2002 – 2008.



3: Compositional Analysis of Residual Kerbside Waste

3.1 Kerbside Collected Residual Waste

This chapter looks at the amount and composition of textiles within the residual waste presented by households in the five selected streets within Birmingham. At present householders in the Birmingham area have access to a weekly collection of residual sacks; they are not able to directly recycle textile waste at the Kerbside.

The streets selected for analysis each represented one of the five Acorn categories and therefore would show any differences in textile waste disposal across the full range of demographics.

The fieldwork was carried out in January 2009. The M·E·L Research collection team visited the designated streets on the same day and as near as possible to the same time as the usual collection. Waste from approximately 50 properties was collected from each street using bulk bags and loaded onto a Luton van. All waste was taken away and sorted at the designated waste site.

The householders were not warned in advance that the collection would happen as this can influence what is put out. However, any householder that inquired at the time of the collection was provided factual information about the analysis and what would happen to their waste; and was given the option of withholding it and having the normal collection crew pick it up for disposal.

In each instance the waste sample was removed from the vehicle and weighed on electronic platform scales. This would give a total weight for the residual waste collected. From this waste all of the textiles were removed for further analysis. Using guidance from a textile recycling specialist at BCR Global Textiles, analysts were able to grade the textiles into several recyclable/re-usable and non-recyclable components.

Table 3.1: Total Kerbside Residual Waste Collected.

ACORN	1	2	3	4	5	COMBINED	B'HAM WEIGHTED	U.K. WEIGHTED*
PARTICIPATION RATE	81.63%	42.86%	54.17%	85.71%	N/A	N/A	N/A	N/A
TOTAL WEIGHT	415.41	204.28	331.09	484.06	517.37	1952.21	N/A	N/A
KG/HH/WK	8.48	4.17	6.90	9.88	10.35	7.97	8.41	8.04
NUMBER OF SACKS	85	38	62	106	103	394	83	79
AVERAGE WEIGHT PER SACK	4.89	5.38	5.34	4.57	5.02	4.95	5.05	5.07

* UK weighted figures relate to Acorn proportions shown under Table 1.1. As the UK has a wide range of residual waste collection containers and frequencies then figures are for demonstration purposes only.

Table 3.1 shows the levels of residual waste collected for analysis. Participation rates in Acorns 2 and 3 were somewhat lower at 43% and 54% respectively when compared to other areas. Over 85% of households in Acorn 4 presented residual waste for collection. Waste from Acorn 5 was pulled out before our collection and therefore exact participation is not known – although judging by the number of sacks collected it seems to have been on a par with that in Acorns 1 and 4.

Overall between 4.17kg/hh/wk (Acorn 2) and 10.35kg/hh/wk (Acorn 5) of residual waste was collected at the Kerbside. An Acorn profile of Birmingham shows that 7.9% of households are Acorn 1 with 12.3% being Acorn 2, 26.6% Acorn 3, 20.8% Acorn 4 and 31.8% Acorn 5 – 0.6% are unclassified. Data from the five samples can therefore be weighted to give a more accurate figure for the waste across Birmingham. This shows that approximately 8.41kg/hh/wk of residual waste is placed at the Kerbside. Each survey area gave a reasonably consistent value for individual sack weights at between 4.57kg (Acorn 4) and 5.38kg (Acorn 2).

3.2 Textile Content of Residual Waste

Textile materials were removed from the residual waste and graded due to their potential recyclability. As the overall weight of residual waste from each area was known, then the levels of textile waste could be shown as kg/hh/wk as well as percentage concentration.

Table 3.2: Kg/hh/wk of Residual Textile Waste.

TEXTILE WASTE KG/HH/WK								
ACORN	1	2	3	4	5	COMBINED	B'HAM WEIGHTED	U.K. WEIGHTED*
CLOTHING FOR RE-USE / EXPORT	0.03	0.04	0.04	0.12	0.27	0.10	0.13	0.10
MATERIAL FOR RAGS	0.01	0.03	0.00	0.01	0.03	0.01	0.02	0.01
FLOCKING MATERIALS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JAZZ MATERIALS	0.01	0.00	0.02	0.02	0.03	0.01	0.02	0.02
SELFSHADE MATERIALS	0.01	0.00	0.02	0.02	0.06	0.02	0.03	0.02
WOOL	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
SHOES (PAIRS) - 14	0.01	0.04	0.14	0.02	0.17	0.08	0.10	0.09
MISC RECYCLABLE ACCESSORIES	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
CARPET	0.00	0.10	0.00	0.03	0.00	0.03	0.02	0.02
STUFFED TEXTILES	0.00	0.07	0.00	0.02	0.11	0.04	0.05	0.04
MATTRESSES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OTHER NON-RECYCLABLE TEXTILES	0.08	0.09	0.02	0.14	0.23	0.11	0.12	0.10
RECYCLABLE TEXTILES	0.07	0.11	0.24	0.21	0.56	0.24	0.31	0.25
NON-RECYCLABLE TEXTILES	0.08	0.26	0.02	0.19	0.34	0.18	0.20	0.16
TOTAL TEXTILES	0.15	0.38	0.26	0.40	0.91	0.42	0.50	0.41

Table 3.3: % Concentration of Residual Textile Waste.

TEXTILE WASTE KG/HH/WK								
ACORN	1	2	3	4	5	COMBINED	B'HAM WEIGHTED	U.K. WEIGHTED*
CLOTHING FOR RE-USE / EXPORT	0.40%	0.99%	0.58%	1.24%	2.57%	1.28%	1.54%	1.23%
MATERIAL FOR RAGS	0.07%	0.61%	0.05%	0.14%	0.25%	0.19%	0.19%	0.16%
FLOCKING MATERIALS	0.00%	0.10%	0.00%	0.00%	0.02%	0.01%	0.01%	0.01%
JAZZ MATERIALS	0.06%	0.00%	0.28%	0.19%	0.28%	0.18%	0.22%	0.19%
SELFSHADE MATERIALS	0.07%	0.00%	0.33%	0.25%	0.57%	0.28%	0.36%	0.30%
WOOL	0.00%	0.00%	0.12%	0.00%	0.00%	0.02%	0.03%	0.03%
SHOES (PAIRS) - 14	0.14%	0.99%	2.01%	0.19%	1.64%	0.95%	1.20%	1.08%
MISC RECYCLABLE ACCESSORIES	0.04%	0.03%	0.06%	0.14%	0.11%	0.09%	0.10%	0.08%
CARPET	0.00%	2.38%	0.06%	0.35%	0.00%	0.35%	0.25%	0.24%
STUFFED TEXTILES	0.03%	1.76%	0.02%	0.22%	1.09%	0.54%	0.60%	0.47%
MATTRESSES	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
OTHER NON-RECYCLABLE TEXTILES	0.92%	2.16%	0.22%	1.39%	2.23%	1.40%	1.47%	1.28%
RECYCLABLE TEXTILES	0.79%	2.74%	3.43%	2.14%	5.44%	3.01%	3.65%	3.08%
NON-RECYCLABLE TEXTILES	0.95%	6.31%	0.30%	1.96%	3.33%	2.28%	2.32%	1.99%
TOTAL TEXTILES	1.74%	9.04%	3.73%	4.10%	8.77%	5.29%	5.97%	5.07%

Figure 3.1: Kg/hh/wk of Residual Textile Waste.

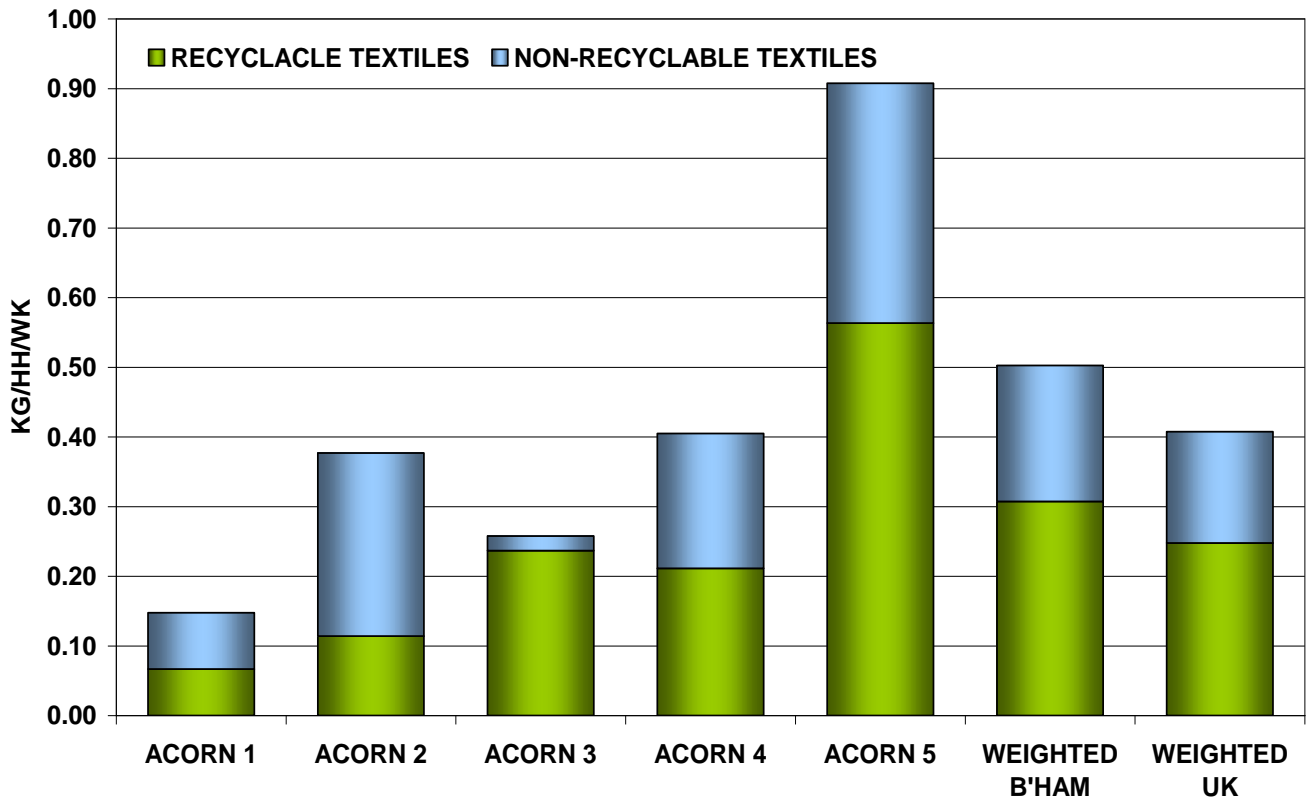
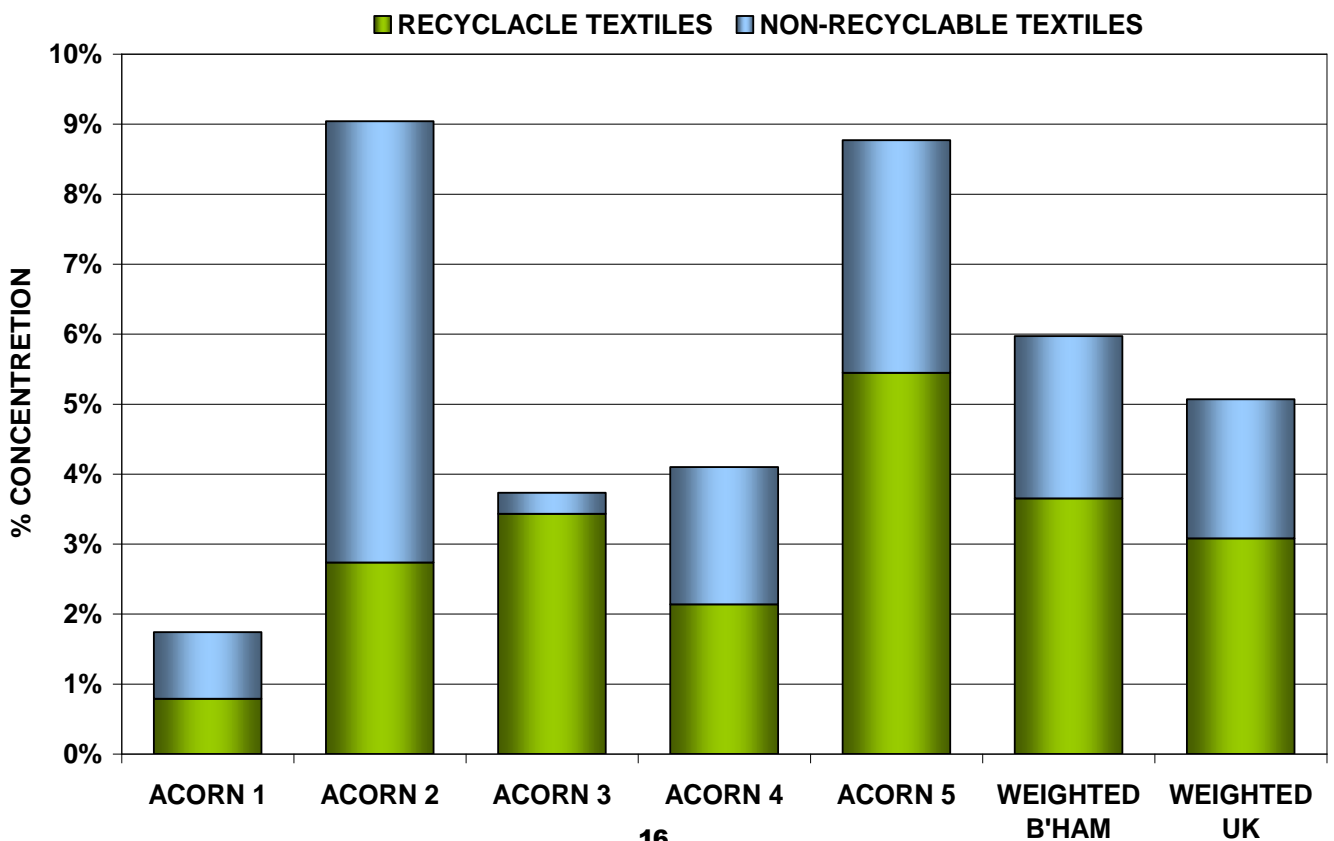


Figure 3.2: % Concentration of Residual Textile Waste.



From the compositional analysis it is seen that each household is seen to be producing between 0.15kg/hh/wk (Acorn 1) and 0.91kg/hh/wk (Acorn 5) of textile waste in their residual sacks. For Birmingham this represents an average of 0.50kg/hh/wk. Figure 3.1 clearly shows the levels of recyclable and non-recyclable textiles within the residual waste with Figure 3.2 representing the proportion that textiles contribute to overall residual waste.

Around 9% of residual waste in Acorn 2 and 5 areas was seen to be comprised of textile waste compared with around 4% in Acorns 3 & 4 and less than 2% in Acorn 1. Both charts show the proportions of recyclable and non-recyclable textiles. In Acorn 2 just 30% of discarded textiles were considered to be of a recyclable format. This rose to 45% in Acorn 1, 52% in Acorn 4, 62% in Acorn 5 and 92% in Acorn 3. Overall it can be said that the majority (61%) of textiles in the residual waste across Birmingham are potentially recyclable; this is the equivalent of 3.7% of the total residual waste collected.

3.3 The Recyclable Element of Residual Textiles

The previous section showed that across Birmingham around 6% of residual waste is due to textiles; the equivalent of 0.50kg/hh/wk. Around 61% of these textiles are of a recyclable type and these materials represent 3.7% or 0.31kg/hh/wk of residual waste.

All of the sorted textiles were grouped into sub-categories ranging from those suitable only for landfill to those with low grade uses such as industrial rags and finally clothing with immediate reuse potential.

Table 3.4: % Recyclable Textiles Within the Residual Waste

ACORN	1	2	3	4	5	COMBINED	B'HAM WEIGHTED	U.K. WEIGHTED*
% RECYCLABLE TEXTILES IN RESIDUAL WASTE	0.79%	2.74%	3.43%	2.14%	5.44%	3.01%	3.65%	3.08%
PROPORTION OF TEXTILES POTENTIALLY RECYCLABLE	45.23%	30.27%	91.91%	52.17%	62.08%	56.87%	61.15%	60.80%
RECYCLABLE ELEMENT OF RESIDUAL TEXTILES								
CLOTHING FOR RE-USE / EXPORT	51.38%	36.31%	16.99%	57.87%	47.25%	42.46%	42.11%	39.79%
MATERIAL FOR RAGS	8.87%	22.36%	1.41%	6.38%	4.65%	6.25%	5.12%	5.32%
FLOCKING MATERIALS	0.00%	3.76%	0.00%	0.00%	0.28%	0.49%	0.34%	0.37%
JAZZ MATERIALS	8.26%	0.00%	8.27%	8.70%	5.18%	6.08%	6.14%	6.29%
SELF SHADE MATERIALS	8.87%	0.00%	9.60%	11.69%	10.47%	9.43%	9.96%	9.62%
WOOL	0.00%	0.00%	3.52%	0.00%	0.00%	0.68%	0.73%	0.96%
SHOES (PAIRS) - 14	17.43%	36.31%	58.54%	8.89%	30.07%	31.73%	32.96%	35.04%
MISC RECYCLABLE ACCESSORIES	5.20%	1.25%	1.67%	6.47%	2.09%	2.88%	2.65%	2.61%

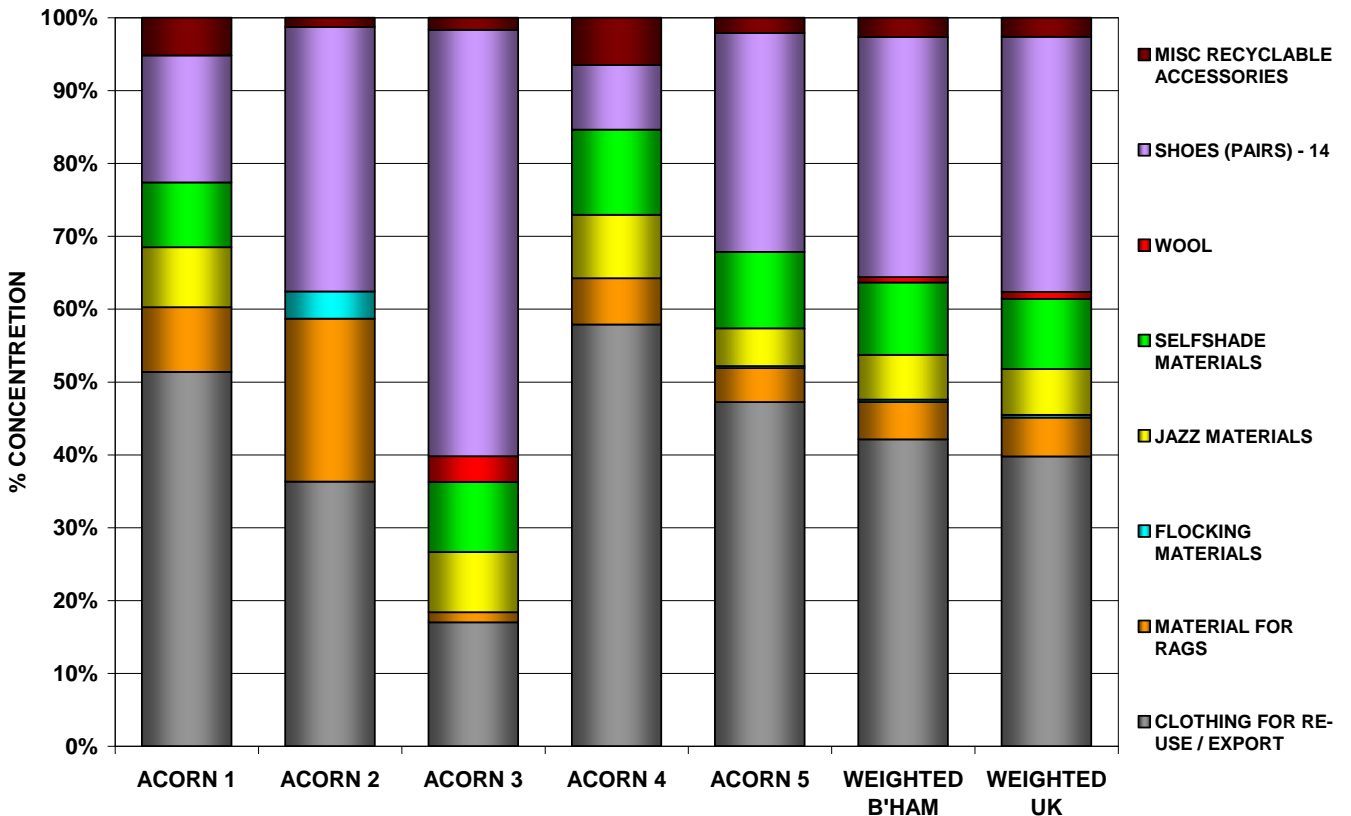
Recyclable textiles contribute between 0.07kg/hh/wk (Acorn 1) and 0.56kg/hh/wk (Acorn 5) towards the total residual waste; this is the equivalent of between 0.8% and 5.44%. From the samples it was seen that anywhere between 30% (Acorn 2) and 92% (Acorn 3) of all residual textiles were of a potentially recyclable kind. Table 3.3 looks at the recyclable textiles in isolation and highlights the levels of the different end uses within it.

Overall it is seen that across the Birmingham samples 42% of recyclable textile waste is reusable clothing with an additional 33% due to pairs of shoes – together these contribute three quarters of all recyclable materials.

Over half of the recyclable textiles in Acorns 1 and 4 were seen to be reusable clothes and in Acorn 3 almost 60% of recyclable textiles were due to shoes.

Self shade textiles were responsible for around 10% of all recyclable materials with jazz materials and ragging textiles contributing 6% and 5% respectively. Very low concentrations of materials suitable for flocking (0.3% of recyclable textiles) and woolen items (0.7% of recyclable textiles) were observed.

Figure 3.3: % Material Types within the Recyclable Textiles



In summary this compositional analysis has shown that an average of 0.31kg/hh/wk of recyclable materials is present in the residual waste from Birmingham; up to 0.56kg/hh/wk in the least affluent Acorn 5 areas. Of this around 0.13kg/hh/wk of clothing suitable for immediate export / reuse is being discarded alongside 0.10kg/hh/wk of shoes in pairs.

Using evidence to shape better services



Research



Public Consultation



Evaluation



Surveys



Consultancy Evaluation



Skillbuilding



M•E•L Research Ltd
8 Holt Court Aston Science Park Birmingham B7 4AX
T: 0121 604 4664 F: 0121 604 6776 W: www.m-e-l.co.uk

Measurement ♦ Evaluation ♦ Learning