

Waste composition analysis in Mid Sussex



A report on behalf of Mid Sussex District Council
by the Waste & Energy Research Group,
University of Brighton



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1. Introduction

Waste composition analysis is an internationally recognised approach to collecting data to help inform decision makers and improve the waste management services provided. The importance of understanding the contents of the waste stream has long been accepted and data has been collected since the late 1800s. In June 2008 the Waste & Energy Research Group at the University of Brighton was contracted by Mid Sussex District Council to undertake a waste analysis for a sample of households from the district.

The aim of this research was to provide the council with a better understanding of the materials in the waste stream with the specific objectives of:

- Assessing levels of dry recyclables remaining in the residual waste
- The levels of food waste

Thirty households from three parts of the district were selected at random and contents analysed. The waste was separated into the following categories:

Materials collected in kerbside scheme:

- Glass – bottles/jars
- Plastic bottles – HDPE/PET
- Cans and aerosols – drink cans, food tins and aerosols
- Paper and cardboard – newspaper/magazines, junk mail, packaging card, corrugated card

Food waste:

- Home compostable – fruit/vegetable peelings
- Non home compostable – processed/cooked food, bread, meat, fish, dairy products

Materials recyclable/compostable at banks/HWRC:

- Textiles & shoes – clothing, curtains, shoes, general household textiles that could be reused
- WEEE – electrical household appliances such as kettles, toasters
- Garden waste – grass cuttings, branches, prunings
- Cartons – drink cartons such as tetra pack

Other:

- Mixed plastic – plastic films, bags, dense plastic packaging
- Miscellaneous – general household objects, non recyclable paper (i.e. soiled with food), takeaway containers, plastic objects, hazardous household waste, cat litter, carpet, building waste such as plasterboard, books, fines and other general bric-a-brac
- Nappies – disposable nappies

A record was also made of any food waste unopened and still in its packaging – the contents and packaging was then separated and included into the appropriate category. Each category was then weighed using electric scales and results recorded.

The sorting was conducted by team of experienced University of Brighton staff headed by a researcher with over 15 years experience of working in waste management who is also a member of the CIWM and sits on the International Solid Waste Association panel on Social and Communication Issues. As members of University staff the research team has a legal responsibility to comply with the Data Protection Act.

2. Results

2.1 Summary

The average residual waste arising was 14.8 kg/household (with a standard deviation of 9.2 kg). Table 1 shows a breakdown in the composition with details for each area sampled in Figure 1. 14.9% of the waste stream was recyclable in the existing kerbside scheme and an additional 9.7% could be recycled using local bring banks or visiting the local Household Waste Recycling Centre. Thirty percent of the waste was food waste and the remainder miscellaneous items. There was a large variation in the waste arisings and composition between the households – note the large standard deviations in Table 1. A breakdown for each household is presented in Figure 2 - the highest arising was 41.50 kg and the lowest 2.45 kg.

Classification	Category	Kg/household (St dev in brackets)	Category % by weight	Classification % by weight
Collected in kerbside scheme	Glass	0.6 (1.2)	4.1	14.9
	Plastic bottles	0.2 (0.3)	1.5	
	Cans and aerosols	0.2 (0.2)	1.1	
	Paper and cardboard	1.2 (1.4)	8.1	
Food waste	Home compostable	2.2 (2.7)	15.1	29.1
	Non home compostable	2.1 (2.0)	14.0	
Recyclable at banks/HWRC	Textiles & shoes	0.8 (1.4)	5.3	9.7
	WEEE	0.2 (1.0)	1.4	
	Garden waste	0.2 (0.7)	1.4	
	Cartons	0.2 (1.1)	1.6	
Other	Mixed plastic	1.6 (1.1)	11.1	46.3
	Miscellaneous	4.7 (4.1)	31.8	
	Nappies	0.5 (2.1)	3.4	

Table 1 Summary of waste composition from households sampled

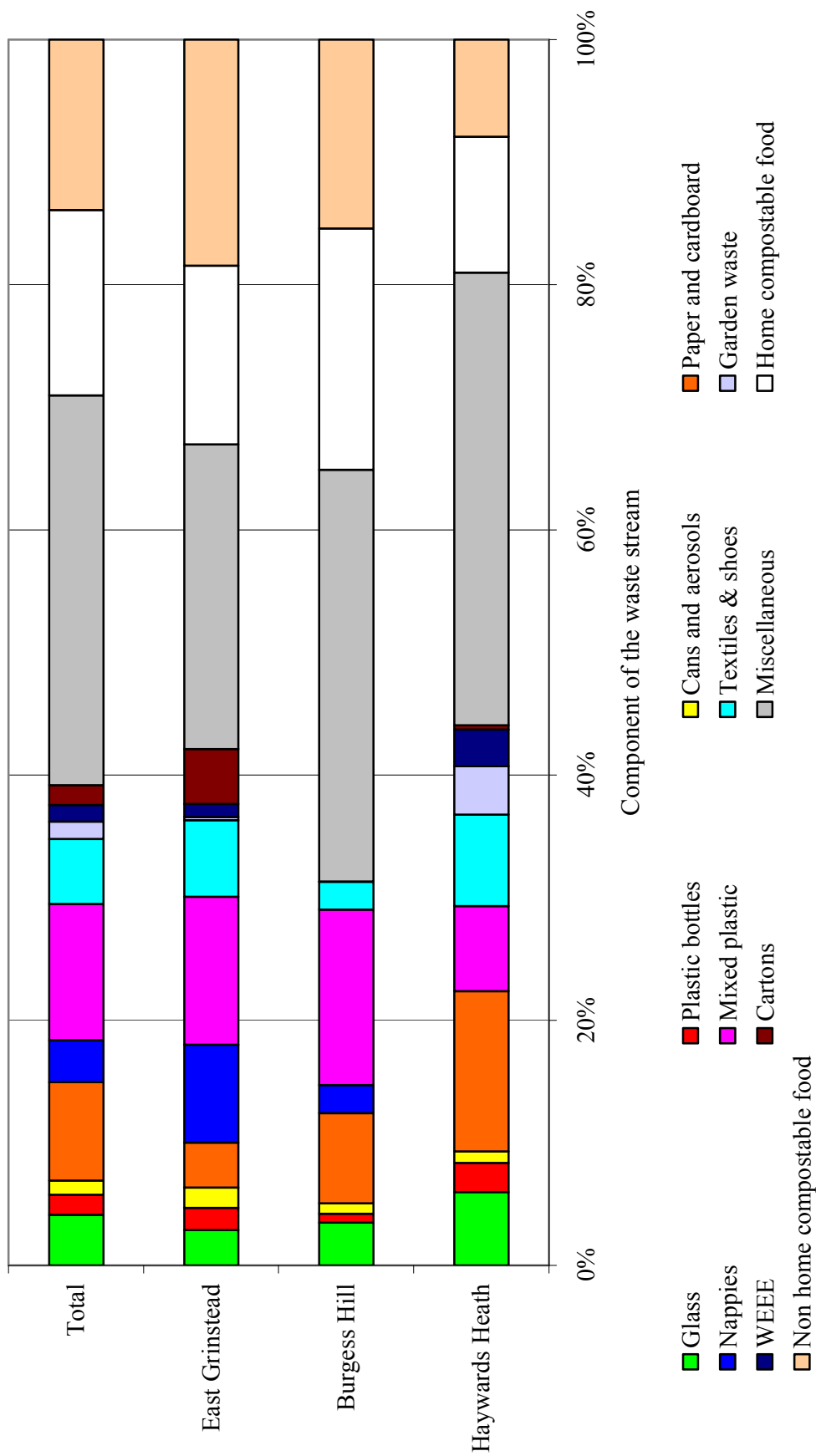


Figure 1 The composition of residual waste from the households sampled

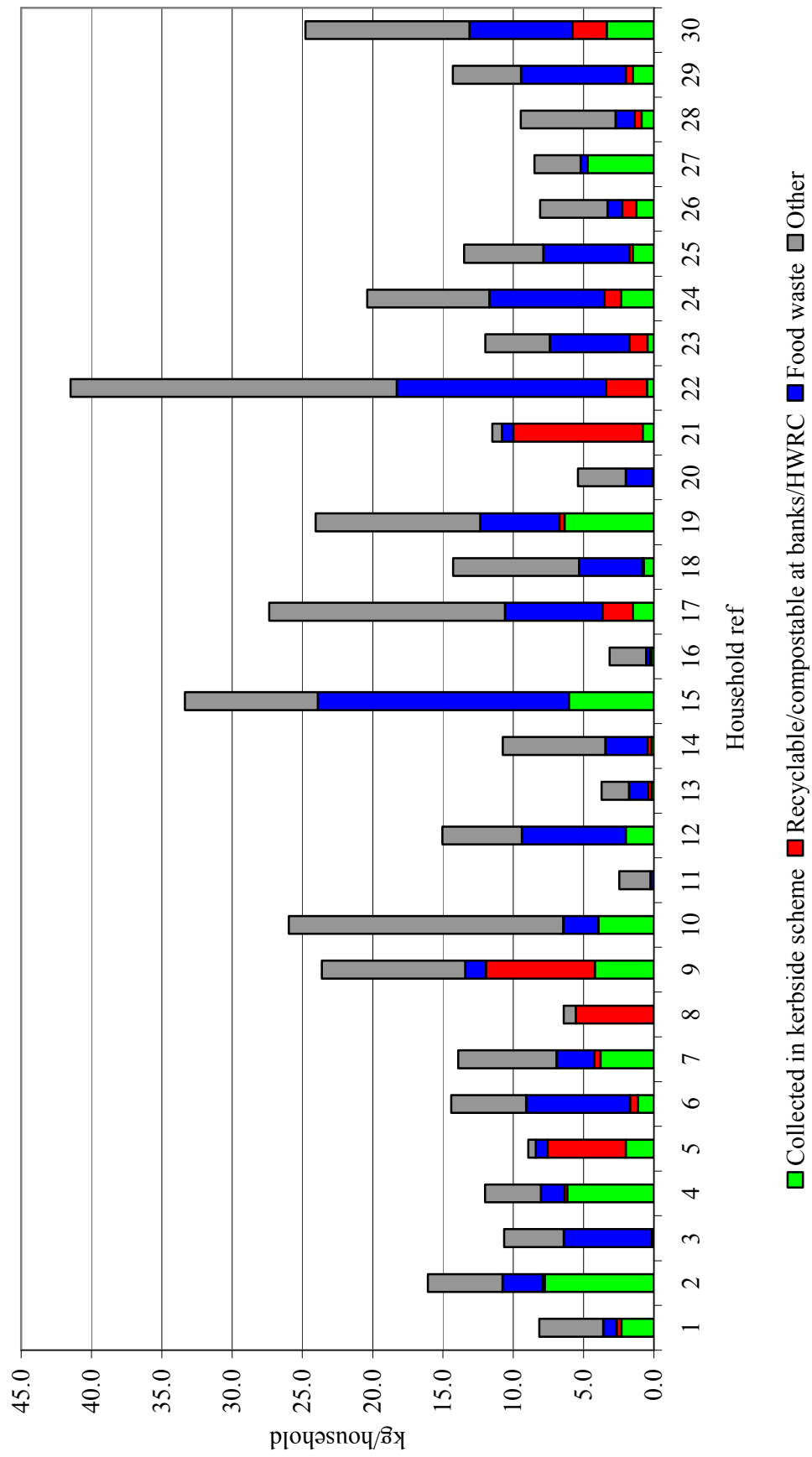


Figure 2 Overview of the composition of waste for each household sampled

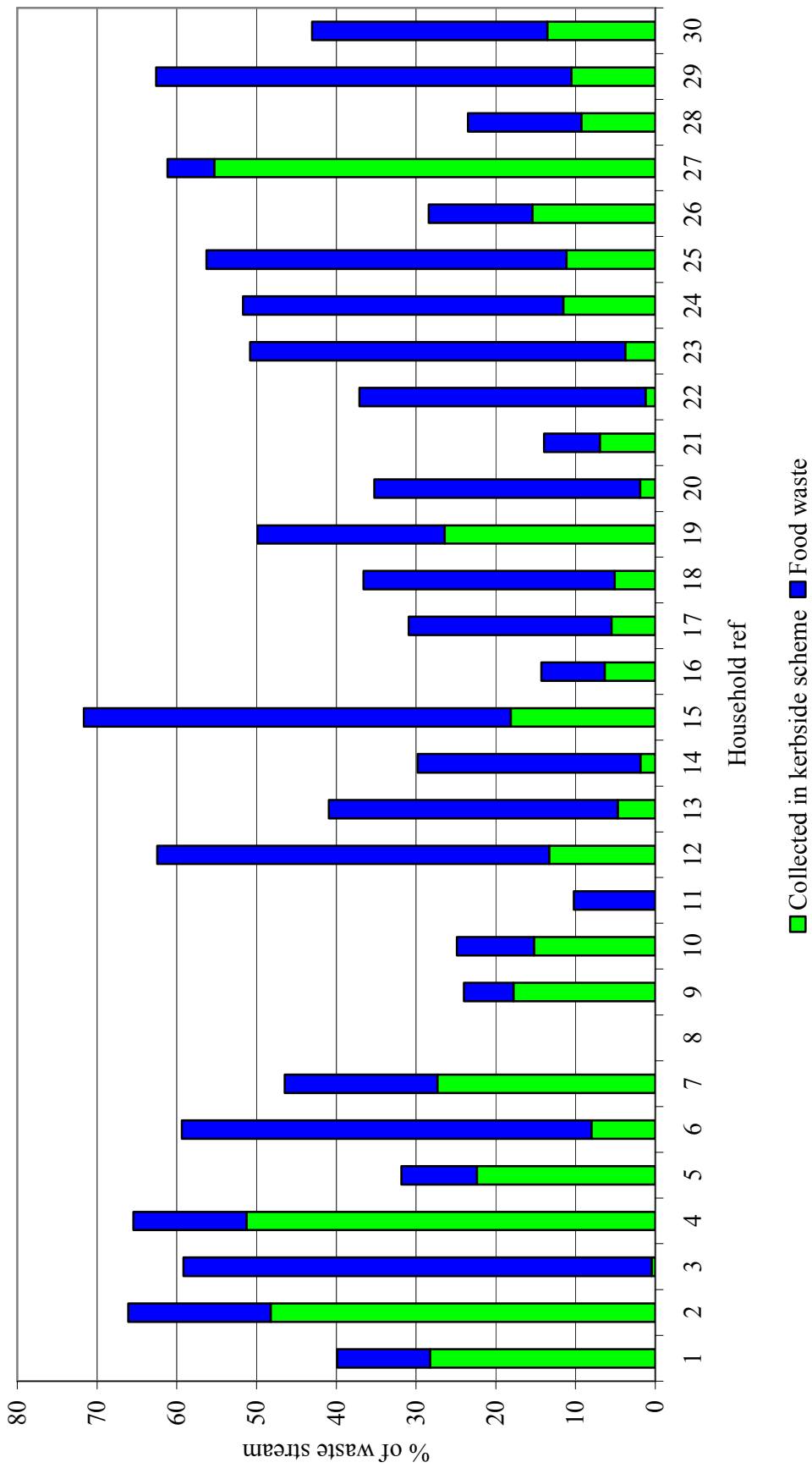


Figure 3 Levels of dry recyclables and food waste for each household sampled

2.2 Recyclables

The levels of kerbside recyclables in the residual waste varied from no recyclable to two household's residual waste that contained over 50% recyclable material (see Figure 3). In terms of weight over half of households set out less than 2 kg of recyclables - the research suggests that the majority of households sampled are using the kerbside recycling facilities provided. Indeed over 50% of the recyclable material in the residual waste stream was generated by only six households. Over 50% of the recyclable material was paper and cardboard – the research team found that the majority of this material was mixed papers/junk mail rather than large quantities of newspapers and magazines. A detailed breakdown of the recycling in the residual waste is presented in Table 2.

Material	Number of households setting out	Weight of material						% of recycling in residual waste
		0kg	<1kg	1.01-2.00 kg	2.01-3.00 kg	3.01-4.00 kg	>4.01 kg	
Paper and cardboard	27	3	5	5	4	1	2	54
Plastic bottles	21	9	20	1	0	0	0	10
Cans and aerosols	18	12	18	0	0	0	0	8
Glass	12	18	6	3	0	1	2	28
Total	28	2	10	7	2	3	6	
0	2	2	0	0	0	0	0	
1	7	0	5	0	2	0	0	
2	2	0	2	0	0	0	0	
3	9	0	2	5	0	1	1	
4	10	0	1	1	1	2	5	

Table 1 Summary of materials collected in the kerbside recycling scheme present in the residual waste



Examples of recyclables in the residual waste stream

2.3 Food waste

29% of the waste stream was food waste – 15.1% home compostable waste and 13.9% non home compostable. All but one household generated food waste (see Figure 4) with an average of 4.3 kg, the most material set out by one household was 17.9 kg – 53% of that households residual waste. A breakdown on the type of food waste and amounts is presented in Table 3. Half of the households set out food waste totalling over 10kg that was still unopened and contained within its packaging. Several of these items were still in date – see Table 4 for examples. Photo examples of food waste are presented on page 10.

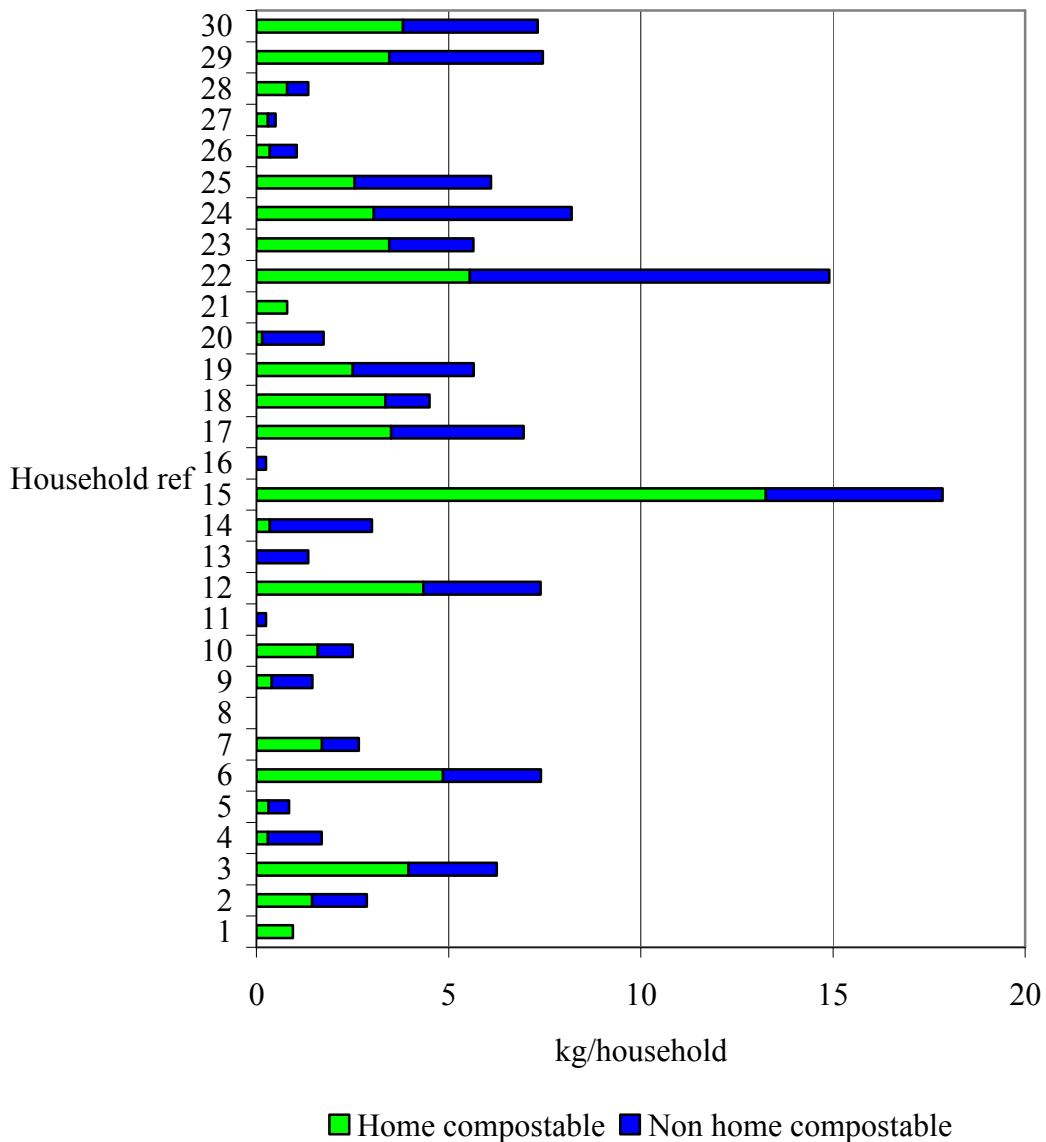


Figure 4 Levels of home compostable/non home compostable food waste generated by each household

Material	Number of households containing material	0kg	<1kg	1.01-2.00 kg	2.01-3.00 kg	3.01-4.00 kg	>4.01 kg
Home compostable	26	4	10	3	2	7	4
Non home compostable	27	3	8	6	4	6	3
Total	29	1	6	6	4	0	13

Table 2 Breakdown of food waste generated by households

Item	Best before (waste was collected on 3/6/08)	Weight (kg)
Carrots	24/05/2008	1.00
Sausages	18/05/2008	0.91
Pots	26/04/2008	0.75
Fish Pie	Unknown	0.70
Lettuce	19/05/2008	0.55
Parsnips	27/04/2008	0.50
Wafer thin ham	06/05/2008	0.50
Crispy potato slices	15/05/2008	0.48
Crispy potato slices	25/05/2008	0.48
Cucumber	28/05/2008	0.45
Pasta	28/05/2008	0.45
Vegetable soup	01/12/2008	0.40
Cheesy potatoes	14/03/2008	0.40
Carrot and Beetroot salad	22/05/2008	0.36
Potato salad	26/05/2008	0.28
Frubes	28/05/2008	0.27
Six eggs	Unknown	0.25
Beetroot salad	22/05/2008	0.24
Lettuce	31/05/2008	0.20
Nuts and raisins	26/01/2008	0.20
Pineapple	25/05/2008	0.20
Swiss Traditional Chocolates	01/07/2008	0.16
Apples	28/05/2008	0.16
Pizza	13/02/2008	0.13
Organic prawns	18/05/2008	0.13
Baby leaf Italian style	18/05/2008	0.12
Baby leaf rocket	28/05/2008	0.10
Maltesers Easter Egg	06/07/2008	0.09
Milky Way Easter Egg	27/07/2008	0.09
WWF Chocolate egg	Unknown	0.06
Oat bar	Unknown	0.04
Hollandaise sauce	01/03/2008	0.03

Table 3 Examples of individual food items still in their packaging in the residual waste stream – ordered by weight (items in bold denote still in date at the time of waste analysis)

Examples of food waste: Row 1: Examples of non compostable waste including bread, meats, sauces. Row 2: Examples of home compostable waste including vegetable and free peelings, tea bags, egg shells – note the variation in generation between the two households sampled. Rows 3 and 4 – examples of food still in its packaging including eggs, prawns, meat and Easter Eggs still in date.



3. Observations and conclusions

Recyclables

The waste analysis showed that the levels of recycling for the households sampled appeared to be high therefore residents were making use of the recycling facilities available.

Figure 4 shows a comparison of the Mid Sussex waste stream compared to a selection of other English authorities. Please note that the authorities presented are a random selection and therefore the demographics of the population and the recycling and waste collection services offered will be different to Mid Sussex. However the results suggest that the Mid Sussex scheme is performing well – note the low levels of recycling present in the waste stream in Figure 5 at 14.9% compared to average at 26.5%

Food waste

130 kg of food waste was generated by the 30 households sampled, this equates to over 240 litres of food waste. Approximately 10% of the food waste was unopened and still in its packaging - the photos below show the total food waste generated.

The results in Figure 5 show that Mid Sussex produces similar levels of food waste to that of the other households sampled. The research strongly supports the council's policy of launching a campaign to reduce the levels of food waste. Over half of the food waste produced was also home compostable – the research suggests that there is an opportunity for further promotion of home composting.



Containment of waste

The majority of households sampled seemed to have paid attention to the council's advice on containing residual waste for two weeks. Much of the food waste sampled had been wrapped in newspaper and placed in plastic bags and many of the households had also washed out plastic food containers before setting them out in the bin.

Of all the households sampled maggots were found in two bins – however it should be noted that these incidents were in isolation i.e. maggots were found on an individual piece of waste and not in the entire bin, also the bins analysed were over 14 days (i.e. they had been in the waste hall waiting for analysis for a couple of days). A household that was not included in the analysis was collected using sacks. It was noticeable that the bin was full of insects and the waste not so well contained.

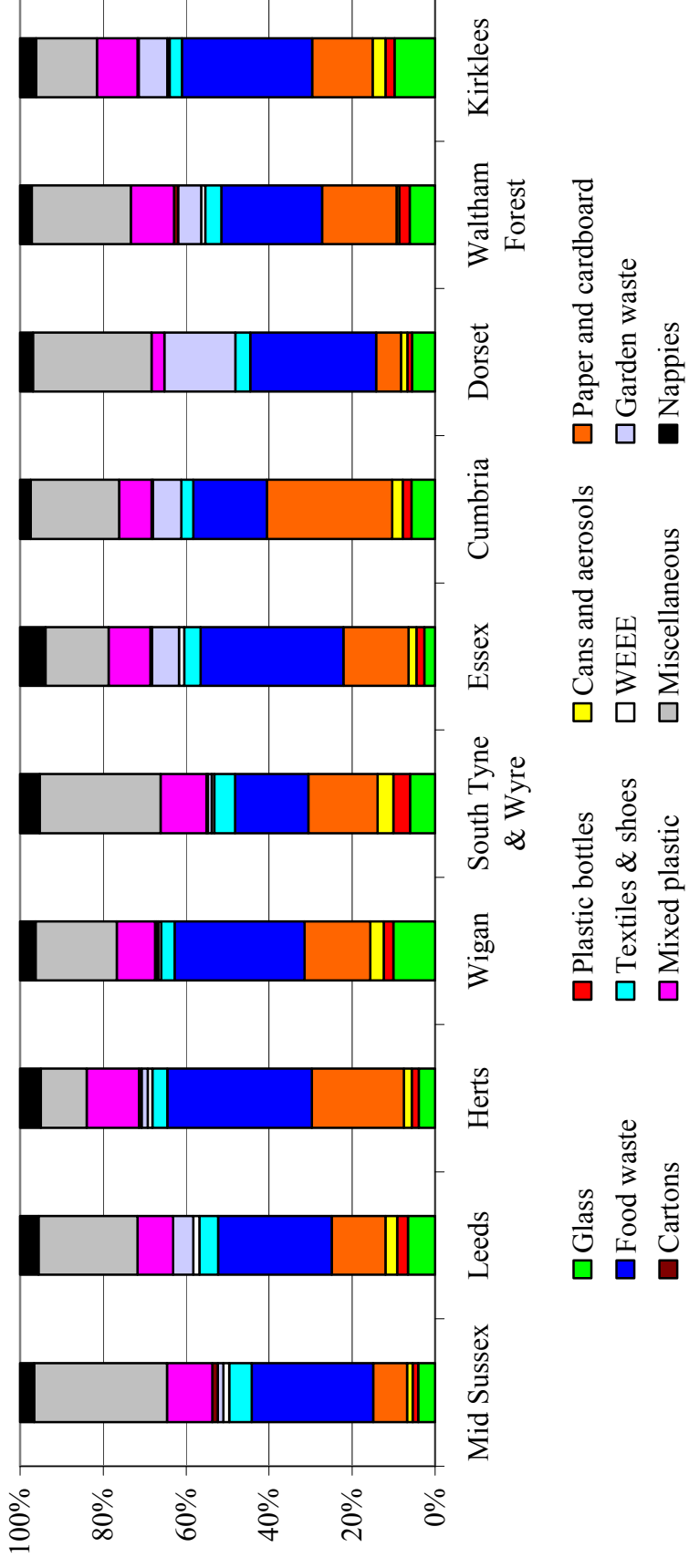


Figure 5 Comparison with of Mid Sussex waste composition with a sample of English local authorities