

National municipal waste compositional analysis in Wales



A report that describes the composition of municipal solid waste in Wales in 2015. The information can be used by national and local governments to inform their waste management policy and communications.

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Front cover photography: plastic bottles containing coloured liquid

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Executive summary

Aims of the analysis

In 2010 the Welsh Government published an overarching strategy for waste entitled *Towards Zero Waste: One Wales One Planet*¹. The strategy set out ambitions for the country to become a high recycling nation by 2025 and a zero waste nation by 2050. Delivery actions have been developed in a series of sector plans², the Waste Prevention Programme³ and the Technical Advisory Note 21⁴ on land use planning and waste management.

Ambitious targets were set up to facilitate significant change in how waste and resources are treated in Wales. By 2025 Wales aims to recycle or compost 70% of waste and landfill no more than 5%. The long term vision for 2050 is for the country to become a zero waste nation.

The analysis of Welsh Municipal Solid Waste commissioned by WRAP and carried out by Resource Futures aims to establish a robust evidence base which will inform how the recycling targets will be achieved in the next decade.

The objective of the work was to estimate the overall composition of municipal solid waste (MSW) using waste compositional data collected for the work across Wales as well as published information on the makeup and quantities of municipal waste.

Summary of methodology

The fieldwork element of the work included a physical waste compositional analysis of the following streams:

- Kerbside collected residual waste
- Kerbside collected food waste
- Kerbside collected co-mingled recycling
- Residual waste collected at HWRCs
- Residual waste collected from businesses by the local authorities
- Bulky waste collected from the kerbside
- Mechanical sweepings

The compositional analysis was carried out in all 22 local authorities and took place over two seasons – summer and winter in 2015.

Overall composition of Municipal Solid Waste

Composition data along with Waste Data Flow returns for 2014/15 were used to estimate overall composition of MSW in Wales.

¹ http://gov.wales/topics/environmentcountryside/epq/waste_recycling/zerowaste/?lang=en

² http://gov.wales/topics/environmentcountryside/epq/waste_recycling/bysector/?lang=en

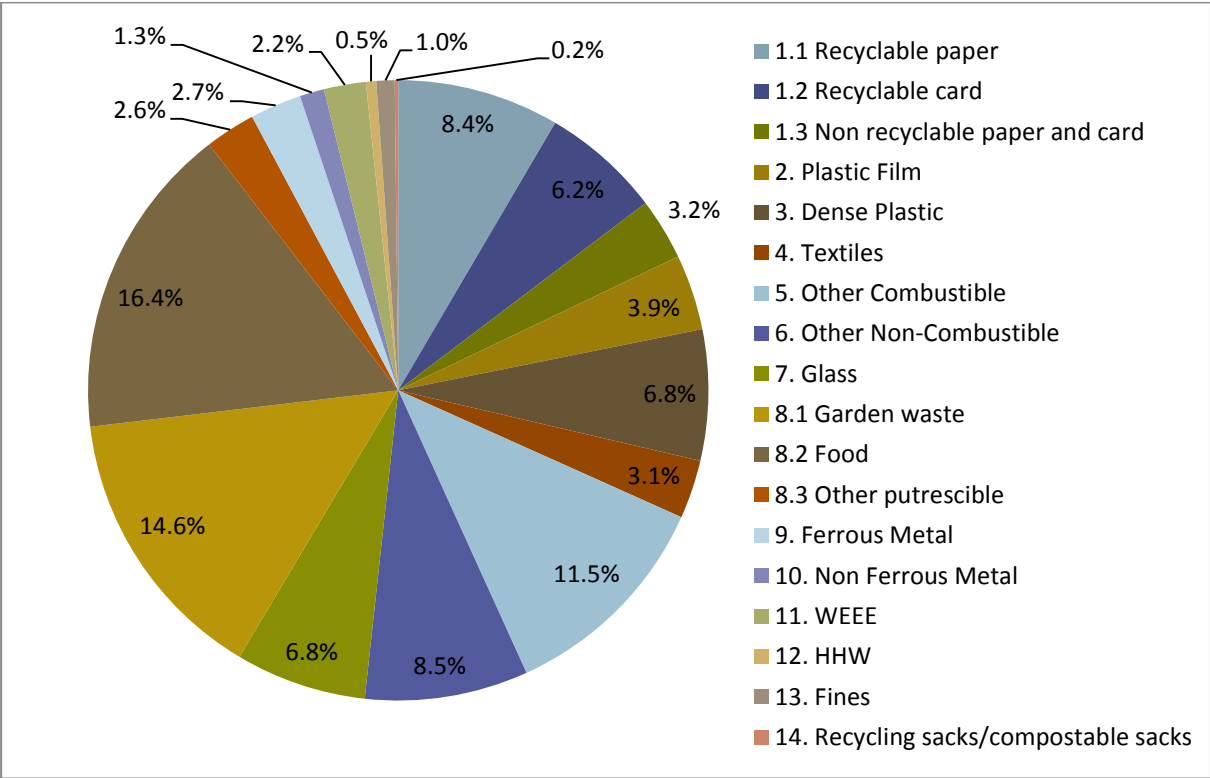
³ http://gov.wales/topics/environmentcountryside/epq/waste_recycling/prevention/waste-prevention-programme/?lang=en

⁴ <http://gov.wales/topics/planning/policy/tans/tan21/?lang=en>

Putrescible waste made up a third (33.6%) of the overall municipal solid waste. This was made up of food waste (16.4%), garden waste (14.6%) and other organic waste (2.6%). Paper and card (17.9%) was the next biggest category and consisted of recyclable paper (8.4%), recyclable card (6.2%) and non recyclable fibres (3.2%). Other combustible waste (11.5%) and other non-combustible inert waste (8.5%) were also prominent.

The composition of the individual streams analysed over the course of the project is included in sections 3.1 through to 3.7

Figure E1 Overall composition of MSW in Wales



Materials recycled

The analysis showed that out of the 1.55 million tonnes of MSW collected in 2014/15 856,000 tonnes were collected for recycling either on the kerbside or via other types of collection. This has improved substantially since the last analysis in 2009.

There are considerable amounts of recyclable material still present within the municipal waste stream. Food waste is the main target material still more likely to be found in the residual waste streams than in the separate food waste services with a 47% capture rate at the kerbside. The dry recycling materials are not as abundant within the residual waste streams with good capture rates achieved for glass, paper and card, rubble and ferrous metals. Dense plastics, textiles and non-ferrous metals are not as well captured as some of the other materials.

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Glossary

MSW - Municipal Solid Waste

HWRC – Households Waste Recycling Centre

WDF - Waste Data Flow

ONS – Office for National Statistics

OAC – Output Area Classification

DEFRA – Department for Environment Food & Rural Affairs

WEEE – Waste Electrical and Electronic Equipment

HHW – Hazardous Household Waste

AHPs – Absorbent hygiene products

Acknowledgements

Resource Futures would like to thank the members of the Steering Group and all of the local authority officers, collection managers and site managers for their assistance in delivering this work.

1.0 Introduction

1.1 Background and context

In 2010 the Welsh Government published an overarching strategy for waste entitled [Towards Zero Waste: One Wales One Planet](#)⁵. The strategy set out ambitions for the country to become a high recycling nation by 2025 and a zero waste nation by 2050. Delivery actions have been developed in a series of [sector plans](#)⁶, the [Waste Prevention Programme](#)⁷ and the [Technical Advisory Note 21](#)⁸ on land using planning and waste management.

[The Municipal Sector Plan](#)⁹ was developed to cover waste collected by or on behalf of the Welsh Local Authorities by private or third sector organisations. The plan sets out the recommended collection arrangements for household waste.

Ambitious targets were set up to facilitate significant change in how waste and resources are treated in Wales. By 2025 Wales aims to recycle or compost 70% of waste and landfill no more than 5%. The long term vision for 2050 is for the country to become a zero waste nation.

In 2013/14 Wales lead the UK in recycling municipal waste by a significant margin, achieving a 54.3% recycling rate. Waste sent to landfill at permitted sites was reduced by 37% between 2010 and 2013. Additionally since 2009-10 progress has been made in reducing household waste arisings by an average of 1.8% per year, and the recycling rate of local authority collected waste has improved by 13.8%.

In order to build on the current success and base future plans on empirical evidence the Welsh Government wished to update the compositional estimates produced in 2009. Additionally many of the Welsh local authorities made changes to the household waste collection systems changing the frequency (some switching to a three weekly residual waste collections) of collections, types of materials (e.g. introducing food waste collections) and the mode of collection of materials (co-mingled or kerbside sort).

1.2 Aims and objectives of the project

The project was commissioned in order to produce robust data on the composition of municipal solid waste (MSW) in Wales.

The objectives of the work included:

- To understand the proportion and make up of recyclable and potentially reusable materials in the MSW stream

⁵ http://gov.wales/topics/environmentcountryside/epq/waste_recycling/zerowaste/?lang=en

⁶ http://gov.wales/topics/environmentcountryside/epq/waste_recycling/bysector/?lang=en

⁷ http://gov.wales/topics/environmentcountryside/epq/waste_recycling/prevention/waste-prevention-programme/?lang=en

⁸ <http://gov.wales/topics/planning/policy/tans/tan21/?lang=en>

⁹ http://gov.wales/topics/environmentcountryside/epq/waste_recycling/publication/municipalsectorplan/?lang=en

- To understand the proportion of biodegradable material and especially food waste within the MSW stream
- To produce robust composition of kerbside collected waste as well as at HWRCs, commercial collections, bulky waste and street sweepings
- To produce estimated composition of residual waste, food waste and co-mingled recycling for the 22 local authorities in Wales

In order to achieve this waste compositional analysis was undertaken over two seasons across all 22 local authorities in Wales. Samples of kerbside collected residual waste, food waste and co-mingled recycling were collected and analysed. The residual waste stream collected through the HWRCs, commercial collections, bulky waste collections and mechanical street sweepings was also analysed. Data collected from the Waste Data Flow (WDF) portal on the quantities of different material streams collected were used to extrapolate and produce the total municipal solid waste composition for Wales.

A Steering Group was formed in order to advise on the local considerations of the work and provide a steer on the project priorities.

2.0 Summary methodology

The following section describes the overall summary of the methodology employed for the compositional analysis and the subsequent data analysis. Full details of the methods used can be found in Appendix 1.

2.1 Sampling

Household samples were identified based on demographic classification from the Office for National Statistics (Output Area Classification¹⁰), collection rounds and local authority officer knowledge. The sampling aimed to ensure that a sample of 210 households was included in the study which was proportional of the overall demographic makeup of the Council. The individual Local Authority compositions are therefore robust at the main category level.

Sampling frames of around 500 households were identified to ensure enough samples were available for collection. Each of the households included in the sampling frame on either of the phases of the research were informed of the work at least three weeks in advance of sample collection via a hand delivered letter and given a chance to opt out of the research. Those households that opted out of the study were excluded from the sampling.

The samples of household residual waste, food waste and co-mingled recycling were collected by Resource Futures teams and transported to a sort site for analysis. Waste from individual households was collected by OAC group and not individually identified

¹⁰ <http://webarchive.nationalarchives.gov.uk/20160105160709/http://www.ons.gov.uk/ons/guide-method/geography/products/area-classifications/ns-area-classifications/ns-2011-area-classifications/index.html>

<http://www.opengeodemographics.com/>

once collected. This helped to ensure that each household's waste was handled confidentially.

A selection of authorities was invited to participate in the commercial waste (both phases) and litter waste (in seasonal phase two only) analysis. The local authorities included represented both urban and rural areas as well as the south and north of the country. Random samples of waste from whole loads of commercial collections and litter were included in the study. Around eight tonnes of commercial waste were analysed in each phase. Around six tonnes of street sweepings were analysed in phase two.

Across Wales 22 HWRC sites were included in each phase of the study. Sites were selected based on throughput, recycling rates and local officer knowledge to cover a wide cross section of sites. Each local authority had one site included in the study in each phase.

2.2 Waste categorisation

A standard category list was agreed with WRAP and the Steering Group. The list aimed to allow for a differentiation between recyclable and non-recyclable materials as well as reusable items. Food waste categories differentiated between avoidable, possibly avoidable and unavoidable food waste items.

Slight changes to the non-recyclable paper and card category were included in phase two of the fieldwork to understand the nature of this material better. The final category list is included in Appendix 2.

2.3 Data collection and management

The analysis teams sorted all material sampled and collected from the kerbside – residual waste, food waste and co-mingled recycling. A 10mm screen was used to separate fine material. Once separated according to the category list each material was weighed using calibrated digital scales and the result recorded for each of the weights.

Trade waste and street sweeping samples were delivered by the local authorities. The sorting followed the same method used for household waste.

The waste from HWRCs was sampled at the point of disposal by the resident. If possible all residents visiting the residual skip were included in the study however if the sites were busy a random selection (i.e. next available resident after the waste from the previous person was recorded) was included in the analysis. Bulky waste was assessed where this was easily available on site.

Individual bulky items were weighed and categorised. Where bags or boxes of mixed small items or black bag waste were brought by the residents all of this mixed material was weighed, a random sample of around 10 bags or boxes was collected throughout the day and the waste was sorted at the end of the day.

Bulky waste was visually assessed and categorised. Standard weights were then used to estimate the quantities.

All material analysed was assessed for re-usability and noted separately.

The results for each of the batches (demographic group collected on a particular day and waste stream) of sorted material was entered separately on to an MS Excel spreadsheet and quality checked prior to analysis.

2.4 Data analysis

Compositional analysis of each waste stream was based on all the material sorted. In a small number of cases where samples were not available (e.g. normal collection crew collected waste before the sampling team) the data was weighted to ensure that the composition represented the demographic population of the local authority.

WasteDataFlow returns from the 2014/15 financial year were used to extrapolate the composition data to the relevant quarters – April to September for the summer phase and October to March for the winter phase.

The composition for each stream and local authority was applied to the tonnages reported. National composition is based on the total waste reported.

Only co-mingled recycling was analysed throughout the project. Where local authorities operated a source segregated service the tonnages reported for the different materials were classified according to the category list and total composition for all LAs was calculated. This assumed there was no contamination in the kerbside sort waste streams.

The streams not analysed were allocated a composition based on the material (e.g. asbestos being a hazardous material) and literature available e.g. DEFRA compositional estimates¹¹.

The analysis of recyclable content and biodegradability of the residual waste was based on the sub categories the materials were sorted into. The widely recyclable categories include: paper, thin and corrugated card, plastic bottles, pots tubs and trays, textiles, glass bottles and jars, garden waste, food waste, ferrous and non-ferrous cans and aerosols and aluminium foil. The full list of materials and their categorisations in terms of recyclability and biodegradability can be found in Appendix 2.

3.0 Results

The following section presents the results of the overall composition for the analysed waste streams as well as the total municipal waste for Wales. The data is presented at the primary category level. Both seasonal phases of the data were included in the analysis however the compositions are very similar and therefore the overall average composition is included throughout the report. Full data sets as well as the data for the individual Local Authorities is included in the accompanying MS Excel spreadsheet.

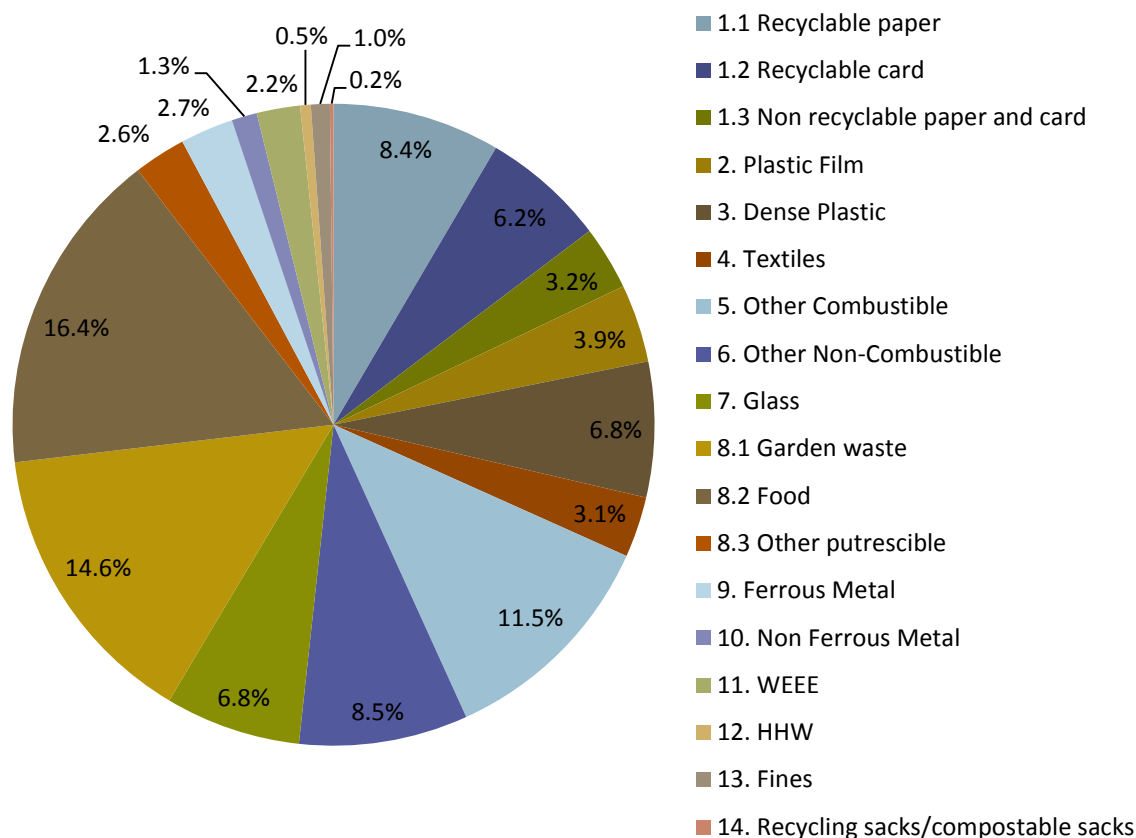
¹¹<http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=18237#RelatedDocuments>

3.1 Solid municipal waste composition

The overall composition of the municipal solid waste was estimated using the extrapolated tonnages for the financial year of 2014/15. All streams were evaluated and an appropriate composition allocated. Where materials were reported separately they were aligned with the main category list for this work.

The following chart table shows the composition of the combined MSW.

Figure 1 Overall composition of MSW in Wales



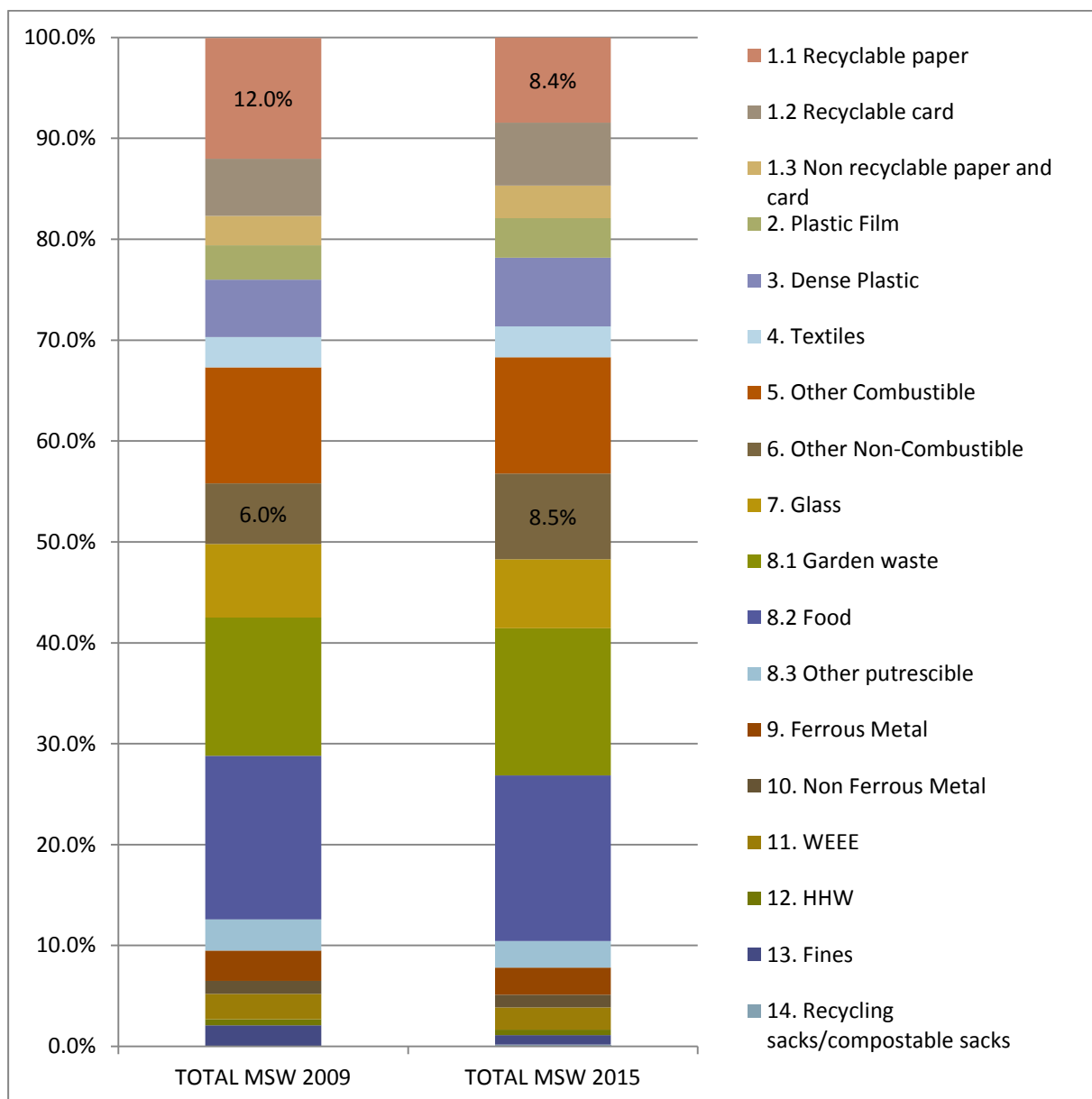
Putrescible waste made up a third (33.6%) of the overall municipal solid waste. This was made up of food waste (16.4%), garden waste (14.6%) and other organic waste (2.6%). Paper and card (17.9%) was the next biggest category and consisted of recyclable paper (8.4%), recyclable card (6.2%) and non-recyclable fibres (3.2%). Other combustible waste (11.5%) and other non-combustible inert waste (8.5%) were also prominent.

The results were compared with the 2009 composition. This is illustrated by the following table and chart.

Table 1 Comparison of composition of MSW in Wales in 2009 and 2015

Main category	TOTAL MSW 2009	TOTAL MSW 2015
1.1 Recyclable paper	12.0%	8.4%
1.2 Recyclable card	5.6%	6.2%
1.3 Non recyclable paper and card	2.9%	3.2%
2. Plastic Film	3.4%	3.9%
3. Dense Plastic	5.7%	6.8%
4. Textiles	3.0%	3.1%
5. Other Combustible	11.5%	11.5%
6. Other Non-Combustible	6.0%	8.5%
7. Glass	7.3%	6.8%
8.1 Garden waste	13.7%	14.6%
8.2 Food	16.2%	16.4%
8.3 Other putrescible	3.1%	2.6%
9. Ferrous Metal	3.0%	2.7%
10. Non Ferrous Metal	1.3%	1.3%
11. WEEE	2.5%	2.2%
12. HHW	0.6%	0.5%
13. Fines	2.1%	1.0%
14. Recycling sacks/compostable sacks	0.0%	0.2%
Grand Total	99.9%	100.0%

Figure 2 Comparison of composition of MSW in Wales in 2009 and 2015



The most noticeable change in the composition of the MSW is the decrease in the proportion of paper 12.0% in 2009 to 8.4% in 2015. On the other hand non-combustible waste increased from 6% to 8.5%. This material is made up of inert materials like rubble and cat litter.

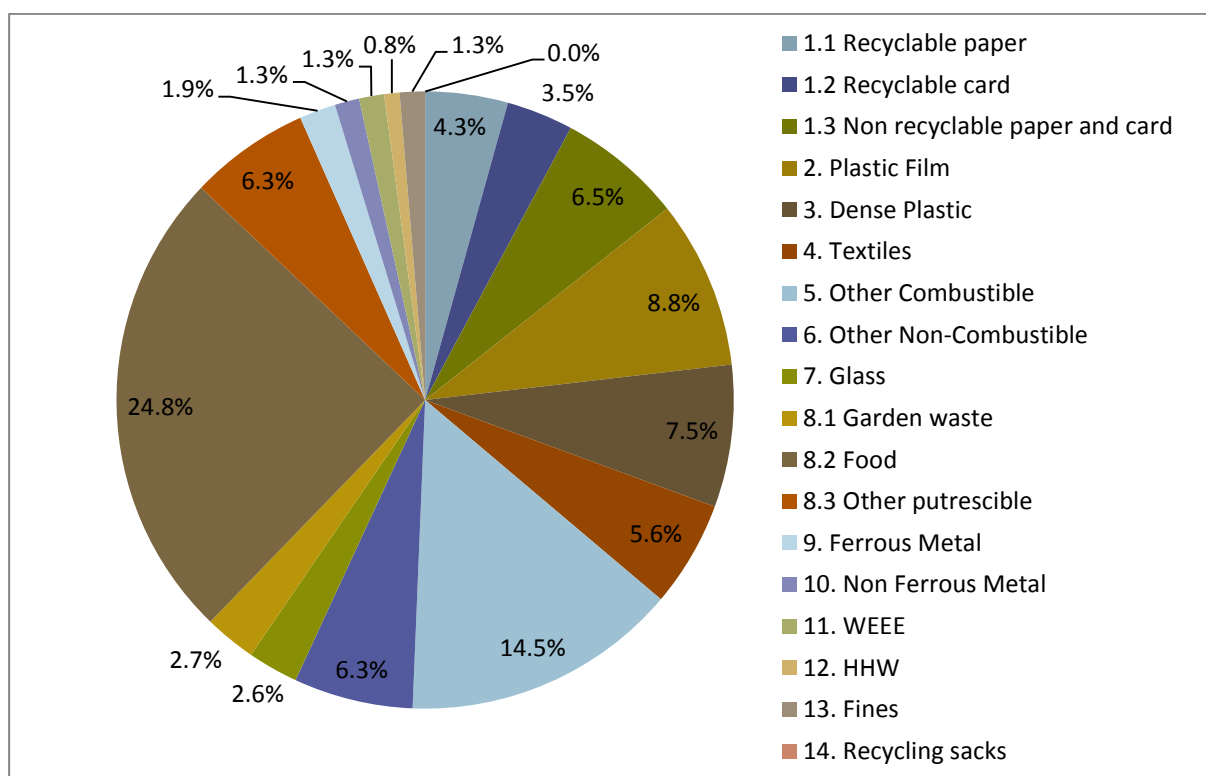
3.2 Kerbside collected residual waste

The following table and figure show the composition of kerbside collected municipal residual waste for all of Wales.

Table 2 Composition of kerbside collected residual waste in Wales

Main category	Wales 2015 composition
1.1 Recyclable paper	4.3%
1.2 Recyclable card	3.5%
1.3 Non recyclable paper and card	6.5%
2. Plastic Film	8.8%
3. Dense Plastic	7.5%
4. Textiles	5.6%
5. Other Combustible	14.5%
6. Other Non-Combustible	6.3%
7. Glass	2.6%
8.1 Garden waste	2.7%
8.2 Food	24.8%
8.3 Other putrescible	6.3%
9. Ferrous Metal	1.9%
10. Non Ferrous Metal	1.3%
11. WEEE	1.3%
12. HHW	0.8%
13. Fines	1.3%
14. Recycling sacks	0.0%
Grand Total	100.0%

Figure 3 Composition of kerbside collected residual waste in Wales



In the kerbside collected residual waste stream, 48.9% of the material was widely recyclable and 59.4% was biodegradable. For both of these characteristics food waste was the single biggest contributor. The most prominent category was putrescible waste which mostly consisted of food waste - 24.8% of the total composition. The majority of the food waste was avoidable (18.9% with 12.2% still in its packaging). The unavoidable food waste made up 3.4% of the composition and possibly avoidable food waste 2.6%.

Other combustible waste made up 14.4% of the composition (this was mostly absorbent hygiene products (AHPs) at 9%) followed by paper and card (14.4%, 7.6% being recyclable), plastic film (8.8%), dense plastics (7.4%, 3.6% being recyclable) other non-combustible waste (6.3%) and textiles (5.6%).

3.3 Kerbside collected dry recycling

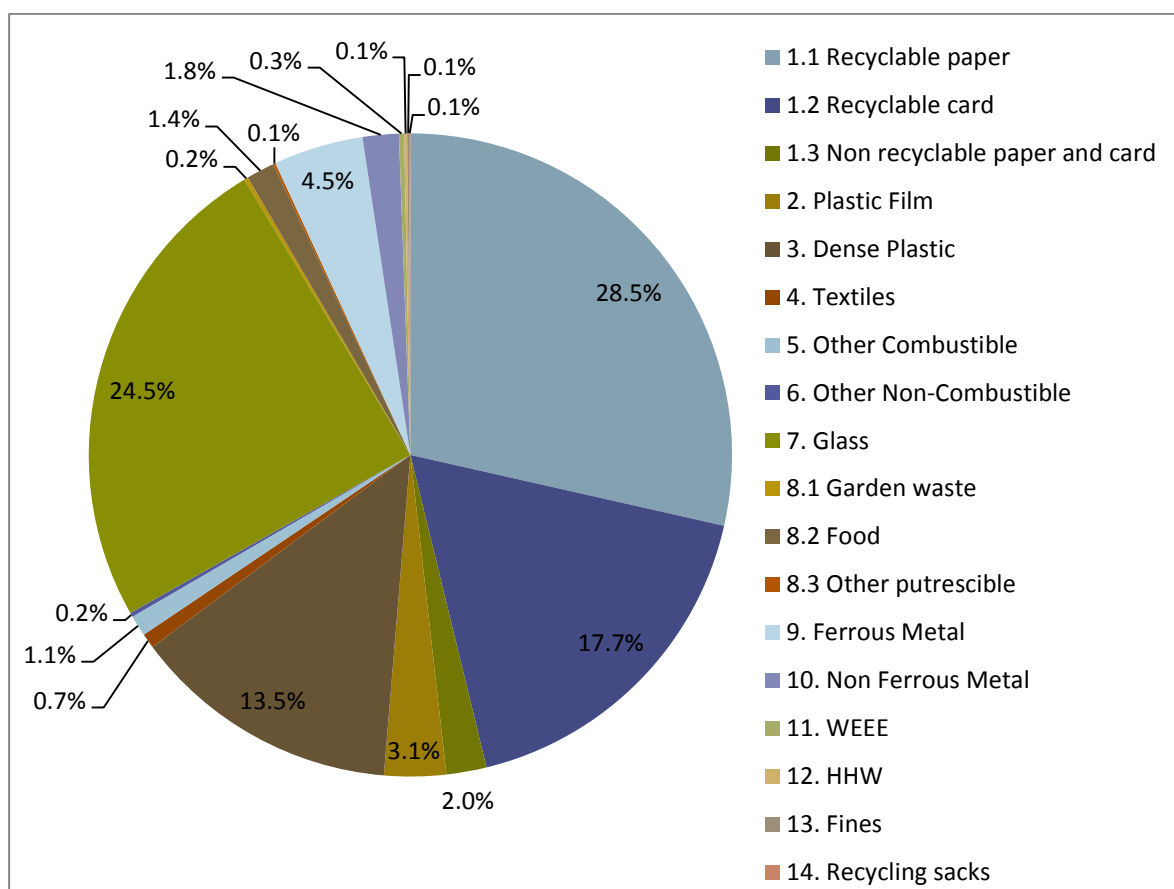
The following table and chart show the composition of the dry recycling collected at the kerbside.

This included both the co-mingled and kerbside sort collection services proportionally.

Table 3 Composition of kerbside collected dry recycling in Wales

Main category	Wales 2015 composition
1.1 Recyclable paper	28.5%
1.2 Recyclable card	17.7%
1.3 Non recyclable paper and card	2.0%
2. Plastic Film	3.1%
3. Dense Plastic	13.5%
4. Textiles	0.7%
5. Other Combustible	1.1%
6. Other Non-Combustible	0.2%
7. Glass	24.5%
8.1 Garden waste	0.2%
8.2 Food	1.4%
8.3 Other putrescible	0.1%
9. Ferrous Metal	4.5%
10. Non Ferrous Metal	1.8%
11. WEEE	0.3%
12. HHW	0.1%
13. Fines	0.1%
14. Recycling sacks	0.1%
Grand Total	100.0%

Figure 4 Composition of the kerbside collected dry recycling in Wales



Almost half (48.2%) of the dry recyclables collected from the kerbside was paper and card. This was followed by glass (24.5%), dense plastics (13.5%) and ferrous metals (4.5%).

The following table shows the capture rates for the widely recyclable materials. Only materials widely accepted in the services (e.g. plastic bottles and plastic pots, tubs and trays for the dense plastics main category) are included in the figures.

Table 4 Capture rates of the main materials in the kerbside collected dry recycling streams

Main category	Capture rate
1.1 Recyclable paper	80.2%
1.2 Recyclable card	73.4%
3. Dense Plastic	66.0%
4. Textiles	7.6%
7. Glass	87.3%
9. Ferrous Metal	73.7%
10. Non Ferrous Metal	49.1%
Total	72.0%

The rates varied for the different material types ranging from 87.3% of glass being captured via the dry recycling systems to only 7.6% of textiles being recycled, although textiles are not currently targeted for kerbside collection for recycling by Welsh authorities. The capture rates represent a marked improvement on the 2008/09 capture rates.

3.3.1 Co-mingled recycling

The following table shows the average composition of the co-mingled collection systems. Co-mingled dry recycling was also included in the overall composition of kerbside collected dry recycling, shown in Table 3 and Figure 4 above.

Table 5 Average co-mingled dry recycling composition in Wales

Main category	Wales 2015 composition
1. Paper and Card	51.4%
2. Plastic Film	4.4%
3. Dense Plastic	14.5%
4. Textiles	1.1%
5. Other Combustible	1.5%
6. Other Non-Combustible	0.3%
7. Glass	16.4%
8. Putrescibles	2.8%
9. Ferrous Metal	4.4%
10. Non Ferrous Metal	2.2%
11. WEEE	0.3%
12. HHW	0.2%
13. Fines	0.1%
14. Recycling sacks	0.2%
Grand Total	100.0%

The average composition of the co-mingled dry recycling was similar to the overall dry composition with the exception of glass (16.4% compared to 24.5% in the total dry recycling stream) as some of the co-mingled schemes collect glass separately. Out of the material collected 16.7% was classed as non-target materials mostly consisting of plastic film (4.4%), no recyclable paper and card (3.1%) and putrescible waste (2.8%).

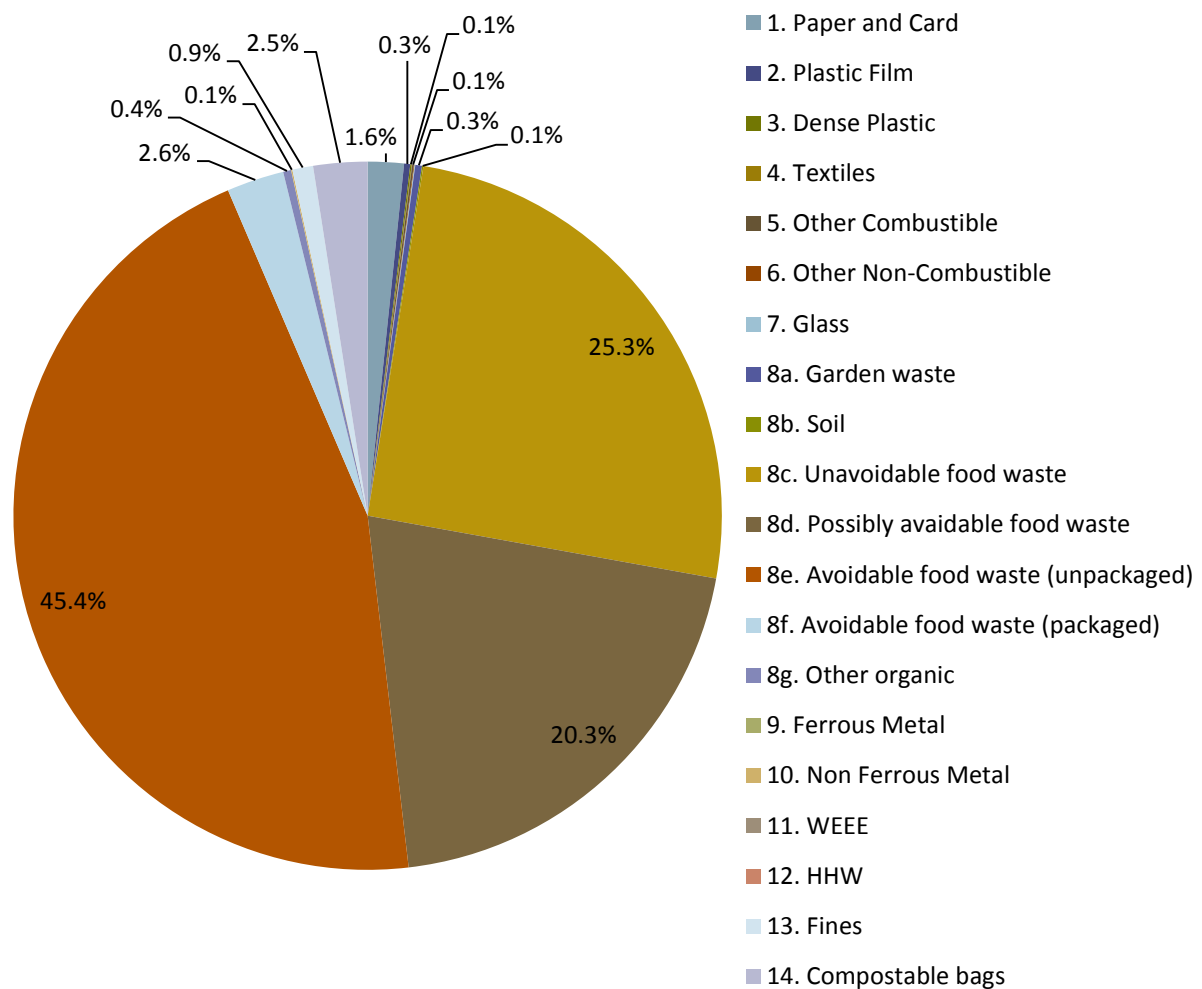
3.4 Kerbside collected food waste

The following table and chart show the composition of the separately collected food waste. The main category list was extended here to show the composition of the putrescible waste in detail.

Table 6 Composition of separately collected kerbside food waste in Wales

Main category	Wales 2015 composition
1. Paper and Card	1.6%
2. Plastic Film	0.3%
3. Dense Plastic	0.1%
4. Textiles	0.0%
5. Other Combustible	0.1%
6. Other Non-Combustible	0.0%
7. Glass	0.0%
8a. Garden waste	0.3%
8b. Soil	0.1%
8c. Unavoidable food waste	25.3%
8d. Possibly avoidable food waste	20.3%
8e. Avoidable food waste (unpackaged)	45.4%
8f. Avoidable food waste (packaged)	2.6%
8g. Other organic	0.4%
9. Ferrous Metal	0.0%
10. Non Ferrous Metal	0.1%
11. WEEE	0.0%
12. HHW	0.0%
13. Fines	0.9%
14. Compostable bags	2.5%
Grand Total	100.0%

Figure 5 Composition of kerbside collected food waste in Wales



Overall 47% of the food waste was captured via the kerbside collection services. This is an improvement from the 2008/09 levels of 2%.

64% of unavoidable and 65% of possibly avoidable waste was captured while only 37% of avoidable food waste was captured. The overall composition shows that the food waste stream is predominantly made up of the target material. The food waste fraction was almost equally split between avoidable food waste (45.4%) and unavoidable and possibly avoidable (45.6%). Additionally 2.6% of the material was avoidable food waste that was still in its packaging. The stream contained only small amounts of contamination >1%.

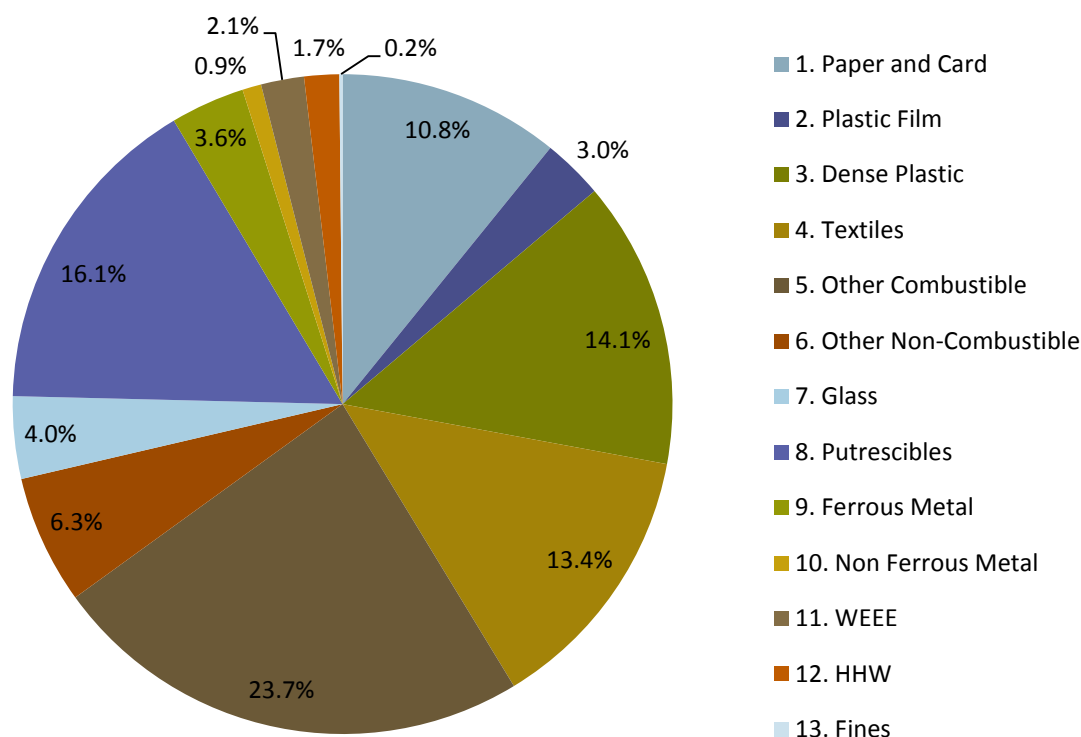
3.5 HWRC collected residual waste

The following table and chart show the composition of the HWRC residual waste stream in Wales.

Table 7 Composition of the residual waste collected at HWRCs in Wales

Main category	Wales 2015 composition
1. Paper and Card	10.9%
2. Plastic Film	3.0%
3. Dense Plastic	14.1%
4. Textiles	13.3%
5. Other Combustible	23.7%
6. Other Non-Combustible	6.4%
7. Glass	4.0%
8. Putrescibles	16.1%
9. Ferrous Metal	3.6%
10. Non Ferrous Metal	0.9%
11. WEEE	2.1%
12. HHW	1.7%
13. Fines	0.2%
Grand Total	100.0%

Figure 6 Composition of the residual waste collected at HWRCs in Wales



Almost a quarter (23.7%) of the waste was classified as other combustible waste which include furniture (5.5%), carpet and underlay (4.9%), wood and cork (2.8%), AHPs (2.6%), mattresses (1%) and other combustible materials (6.9%). Putrescible waste make up 16.1% (12.3% of the composition was food waste from the black bag waste) followed by dense plastics (14.1%), textiles (13.3%) and paper (10.9%).

Recyclable fractions were found in the HWRC residual stream with 39.1% being widely recyclable at the kerbside with further items widely accepted at HWRCs such as other dense plastics (12.6%), furniture (5.5%), carpet and underlay (4.9%), wood and cork (2.8%), inert materials (6.9%), other ferrous metals (2.7%) and WEEE (2.1%) were also found.

The material was also assessed for reusability. 7.9% of the material was considered reusable at the point of disposal (see Appendix 1 for details of how this analysis was carried out). The majority of this material was furniture and textiles.

3.6 Household collected bulky waste

The following table shows the composition of the bulky waste collected from the kerbside via council provided collections.

Table 8 Overall composition of bulky waste collected from the kerbside in Wales

Main category	Wales 2015 composition
1. Paper and Card	0.1%
2. Plastic Film	0.0%
3. Dense Plastic	0.8%
4. Textiles	0.3%
5. Other Combustible	40.4%
6. Other Non-Combustible	1.3%
7. Glass	0.1%
8. Putrescibles	0.0%
9. Ferrous Metal	1.2%
10. Non Ferrous Metal	0.0%
11. WEEE	55.9%
12. HHW	0.0%
13. Fines	0.0%
14. Compostable bags	0.0%
Grand Total	100.0%

Bulky waste was mostly made up of WEEE (55.9%, mostly white goods) and other combustible material (40.4%) like furniture and mattresses. Overall 13% of that material was reusable. It is worth noting that there was variation between the phases. From the samples taken in phase 1, furniture composed 18.2% of bulky waste arisings and white goods composed 61.5%. In phase 2, furniture composed 41.3% of bulky waste sampled while white goods made up 36.3%. This wide variation was not repeated in other waste streams or for other types of waste. It suggests that bulky composition may be worth investigating further.

3.7 Commercial collected residual waste

The following table and figure show the composition of the commercial waste collected by the local authorities.

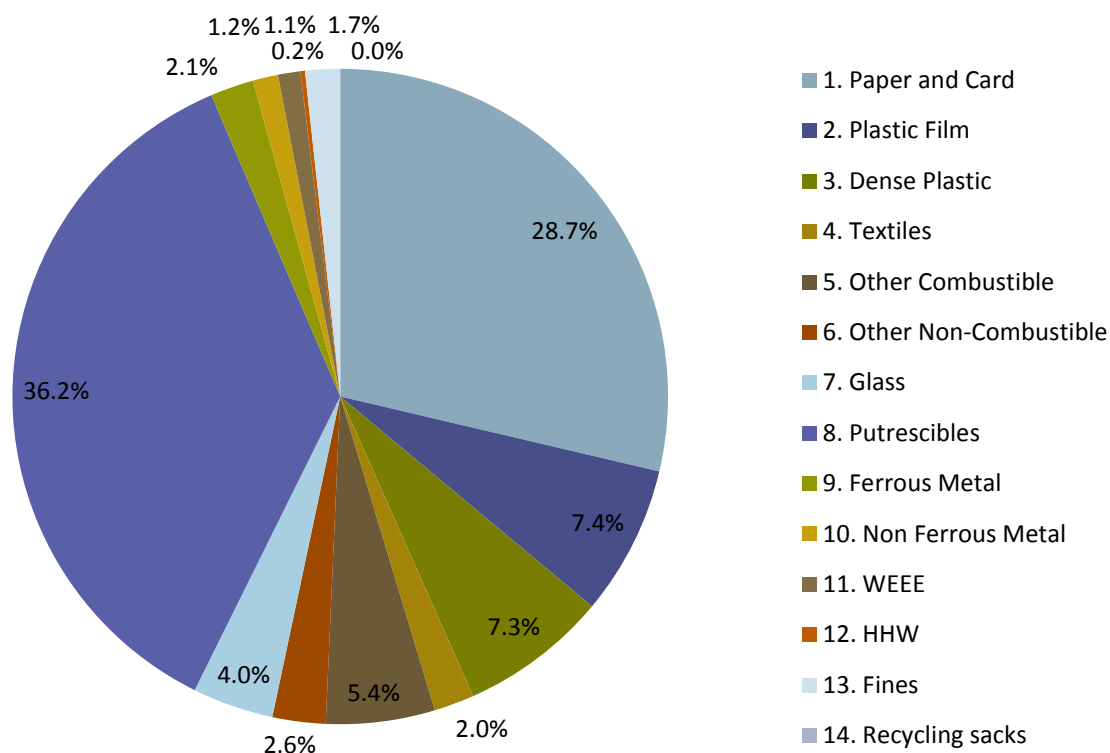
The composition is similar to the household residual waste composition with around a third of the waste categorised as putrescible (27.5% of the composition being food). This was followed by paper and card (28.7%), plastic film (7.4%) and dense plastics (7.3%).

A significant proportion of the material could have been recycled at the kerbside (63.3%) and over 70% of the material was biodegradable. Food waste and paper and card were the categories mostly contributing to the recyclability and biodegradability of the material.

Table 9 Composition of commercial waste collected by LAs in Wales

Main category	Wales 2015 composition
1. Paper and Card	28.7%
2. Plastic Film	7.4%
3. Dense Plastic	7.3%
4. Textiles	2.0%
5. Other Combustible	5.4%
6. Other Non-Combustible	2.6%
7. Glass	4.0%
8. Putrescibles	36.2%
9. Ferrous Metal	2.1%
10. Non Ferrous Metal	1.2%
11. WEEE	1.1%
12. HHW	0.2%
13. Fines	1.7%
14. Recycling sacks	0.0%
Grand Total	100.0%

Figure 7 Composition of commercial waste collected by LAs in Wales



3.8 Street sweepings

The following table shows the composition of the mechanical sweepings fraction of municipal waste stream.

Table 10 Composition of mechanical street sweepings in Wales

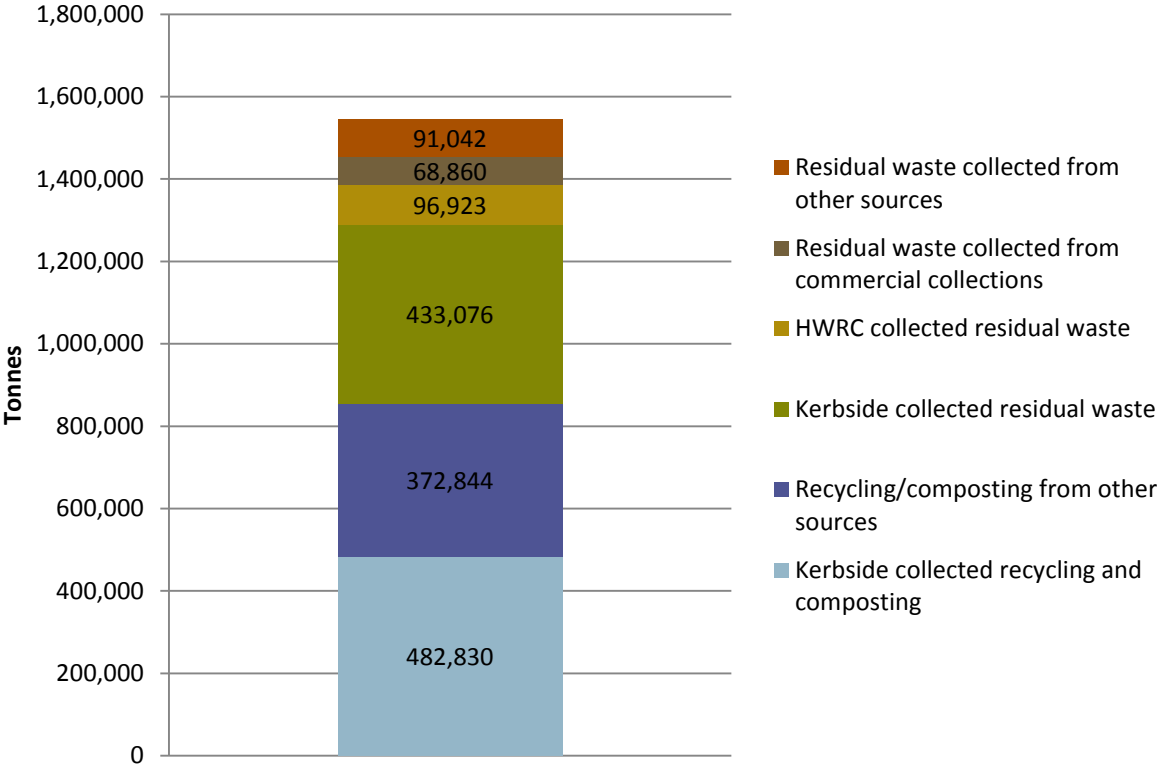
Main category	Wales 2015 composition
1. Paper and Card	0.0%
2. Plastic Film	0.1%
3. Dense Plastic	0.1%
4. Textiles	0.0%
5. Other Combustible	0.1%
6. Other Non-Combustible	0.8%
7. Glass	0.0%
8. Putrescibles	89.8%
9. Ferrous Metal	0.2%
10. Non Ferrous Metal	0.0%
11. Waste Electrical and Electronic Equipment	0.0%
12. Potentially Household Hazardous Waste Items	0.0%
13. Fines	9.0%
Grand Total	100.0%

The great majority of the material was classified as putrescible material and the overall biodegradability was 94.1%

3.9 Overall MSW arisings and recyclable materials

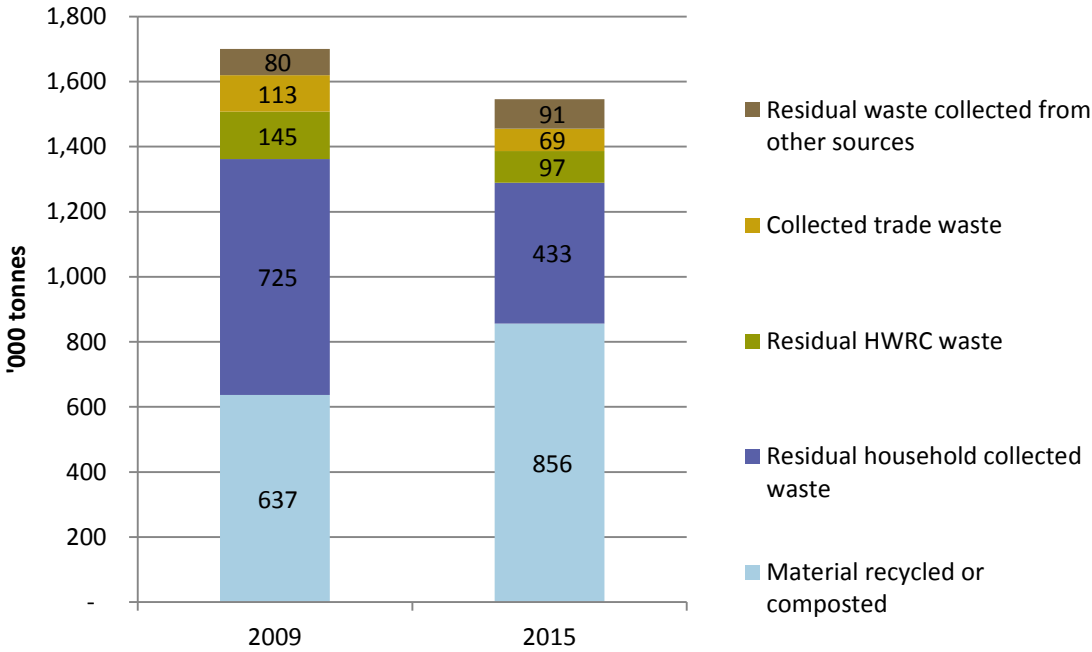
The following figure shows the tonnages of the MSW for the broad waste streams. The residual waste collected from other sources includes: litter, sweepings, fly tipping waste, clinical waste, and asbestos.

Figure 8 Municipal Solid Waste sources in Wales



Overall 1.55 million tonnes of MSW was collected in 2014/15. The following table shows the makeup of the MSW compared to the results from the 2009 study.

Figure 9 Comparison of sources of MSW from 2009 and 2015



The overall volume of the material has decreased over the last 6 years with big advances in moving the material away from the kerbside and HWRC residual waste into recycling and composting.

3.9.1 Recyclable and compostable material

The following table shows the distribution of materials within the different MSW waste streams.

Table 11 Distribution of material within the municipal waste streams

Main category	Total MSW	Kerbside collected recycling and composting	Recycling/composting from other sources	Kerbside collected residual waste	HWRC collected residual waste	Residual waste collected from commercial collections	Residual waste collected from other sources
Total within the MSW	100%	31.2%	24.1%	28.0%	6.3%	4.5%	5.9%
1.1 Recyclable paper	8.4%	58.3%	15.5%	14.4%	2.9%	4.3%	4.6%
1.2 Recyclable card	6.2%	48.7%	22.2%	15.7%	2.8%	7.3%	3.3%
1.3 Non recyclable paper and card	3.2%	13.6%	1.9%	56.8%	8.0%	14.4%	5.4%
2. Plastic Film	3.9%	14.1%	2.3%	62.8%	4.8%	8.4%	7.7%
3. Dense Plastic	6.8%	34.1%	12.2%	30.6%	13.0%	4.8%	5.3%
4. Textiles	3.1%	4.2%	9.7%	50.9%	27.5%	2.9%	4.8%
5. Other Combustible	11.5%	1.6%	42.4%	35.2%	12.9%	2.1%	5.7%
6. Other Non-Combustible	8.5%	0.5%	69.5%	20.6%	4.7%	1.4%	3.4%
7. Glass	6.8%	61.8%	17.5%	10.8%	3.7%	2.6%	3.5%
8.1 Garden waste	14.6%	51.2%	33.5%	5.2%	0.8%	1.6%	7.8%
8.2 Food	16.4%	39.3%	1.5%	42.3%	4.7%	7.4%	4.7%
8.3 Other putrescible	2.6%	1.9%	10.1%	67.3%	4.5%	6.1%	10.2%
9. Ferrous Metal	2.7%	29.0%	34.0%	20.0%	8.5%	3.6%	5.0%
10. Non Ferrous Metal	1.3%	24.7%	30.3%	28.2%	4.5%	4.3%	8.0%
11. WEEE	2.2%	2.1%	61.3%	16.7%	6.1%	2.3%	11.6%
12. HHW	0.5%	4.7%	24.6%	42.2%	20.0%	1.9%	6.5%
13. Fines	1.0%	8.3%	0.3%	38.9%	1.0%	8.1%	43.4%
14. Recycling sacks/compostable sacks	0.2%	97.0%	2.7%	0.2%	0.0%	0.0%	0.0%

The first row within the table shows which sources they different materials come from – 31.2% of all MSW is recycled via kerbside collections with further 24.1% collected for recycling via other routes (including HWRCs and bring banks).

The rest of the table illustrates the distribution of the different material streams within MSW. For example recyclable paper which made up 8.4% of the total MSW composition, was mostly present in the kerbside collected recycling streams (58.3%). A further 15.5% of this material was found in the kerbside residual waste stream.

Materials such as glass and other non-combustible waste mostly end up within the recycling streams. Food waste was a major contributor to the overall composition and was mostly found within the residual waste stream (42.3%). A similar proportion of food was found within the kerbside collected recycling and composting (39.3%). Around a third of dense plastics were making their way into the kerbside residual waste stream with a further 13% found in the HWRC waste. Although not hugely contributing to the overall composition of the MSW metals are recycled in only around half of all instances.

The following table shows the proportion of recyclable and compostable material overall in each of the waste streams. Only target materials were included in the kerbside collected dry recycling in order to exclude contamination. An assumption has been made that there was no contamination in materials collected separately via other means.

Table 12 Widely recyclable materials and food waste found in MSW

Category		Kerbside collected recycling and composting	Recycling/com posting from other sources	Kerbside collected residual waste	HWRC collected residual waste	Residual waste collected from commercial collections	Residual waste collected from other sources	TOTAL MSW
Widely recyclable	Tonnage	446,902	372,844	211,571	37,900	43,593	42,742	1,155,552
	%	92.6%	100.0%	48.9%	39.1%	63.3%	46.9%	74.8%
Food waste	Tonnage	96,256	3,068	107,503	11,895	18,915	12,044	249,682
	%	19.9%	0.8%	24.8%	12.3%	27.5%	13.2%	16.2%
Total	Tonnage	482,830	372,844	433,076	96,923	68,860	91,042	1,545,574

Each of the residual waste streams included a proportion of widely recyclable material (recyclable paper and cards, cartons, plastic bottles, glass bottles and jars, cans, tins aerosols and aluminium foil, textiles and batteries) ranging from 39% in the HWRC stream to 63.3% within the commercial residual waste stream. Overall 74.8% of the MSW is currently widely recyclable. Around 16% of all material collected was food waste. There was over 200,000 tonnes of materials still available within the kerbside collected residual waste stream with the potential to be diverted. Other waste streams also had some potential for increased diversion. 63.3% of commercial residual waste, contributing almost 70,000 tonnes of material, was widely recyclable. This includes 27.5% of material being food waste. HWRC residual waste had a smaller proportion of material that was widely recyclable (39.1%) however materials that are accepted at many HWRCs like wood, dense plastics, metals, carpet, furniture, WEEE and other non-combustible waste made up a further 37% (almost 36,000 tonnes) of the materials disposed.

It is clear from the table above that there are significant amounts of recyclable material still present within the municipal waste stream. Food waste is the main target material still more likely to be found in the residual waste streams than in recycling. The dry recycling materials are not as abundant within the residual waste streams with good capture rates achieved for garden waste, glass, paper and card, rubble and ferrous metals. Dense plastics, textiles and non-ferrous metals are not as well captured as some of the other materials.

Appendix 1: Detailed research methodology

1.0 Sampling

1.1 Household samples

In order to understand the requirements of the project Resource Futures mapped the collection services for each LA across the OAC groups. An initial assessment of the demographics using the open source Output Area Classification (OAC)¹² developed by the Office of National Statistics based on 2011 Census data was used to construct socio-demographically representative samples.

The following table shows the OAC groupings for each of the local authority.

Table 13 Output Area Classification profiles for the local authorities in Wales

Supergroup Code	1	2	3	4	5	6	7	8	Total
	Rural Residents	Cosmopolitans	Ethnicity Central	Multicultural Metropolitans	Urbanites	Suburbanites	Constrained City Dwellers	Hard-Pressed Living	
Blaenau Gwent	3.3%	0.0%	0.0%	0.0%	1.7%	8.7%	9.1%	77.2%	100.0%
Bridgend	6.6%	0.0%	0.0%	0.0%	13.5%	32.0%	8.4%	39.5%	100.0%
Caerphilly	5.3%	0.0%	0.0%	0.0%	9.9%	21.5%	6.0%	57.4%	100.0%
Cardiff	0.1%	15.0%	4.7%	14.7%	23.3%	19.5%	8.2%	14.5%	100.0%
Carmarthenshire	43.4%	0.2%	0.0%	0.7%	7.8%	14.1%	5.1%	28.7%	100.0%
Ceredigion	64.1%	9.4%	0.0%	0.4%	10.2%	2.7%	4.3%	9.0%	100.0%
Conwy	20.9%	1.3%	0.0%	0.0%	16.8%	31.3%	11.4%	18.3%	100.0%
Denbighshire	29.0%	0.0%	0.0%	0.0%	11.4%	31.5%	9.0%	19.1%	100.0%
Flintshire	19.3%	0.2%	0.0%	0.2%	5.6%	38.0%	5.4%	31.2%	100.0%
Gwynedd	43.6%	3.7%	0.0%	1.2%	9.2%	5.4%	6.4%	30.4%	100.0%
Isle of Anglesey	48.5%	0.0%	0.0%	0.0%	7.0%	10.9%	5.2%	28.4%	100.0%
Merthyr Tydfil	2.6%	0.0%	0.0%	1.1%	8.5%	13.8%	6.9%	67.2%	100.0%
Monmouthshire	34.2%	0.0%	0.0%	0.0%	10.5%	24.7%	7.1%	23.4%	100.0%
Neath Port Talbot	8.7%	0.0%	0.0%	0.2%	7.8%	25.4%	8.9%	49.0%	100.0%
Newport	3.8%	0.6%	1.1%	15.2%	16.0%	23.6%	13.5%	26.3%	100.0%

¹² Description of OAC groups are included in the Appendix and can be found online <http://www.ons.gov.uk/ons/guide-method/geography/products/area-classifications/ns-area-classifications/ns-2011-area-classifications/pen-portraits-and-radial-plots/index.html>

Supergroup Code	1	2	3	4	5	6	7	8	Total
	Rural Residents	Cosmopolitans	Ethnicity Central	Multicultural Metropolitans	Urbanites	Suburbanites	Constrained City Dwellers	Hard-Pressed Living	
Pembrokeshire	50.1%	0.0%	0.0%	0.0%	9.8%	6.3%	8.0%	25.8%	100.0%
Powys	65.8%	0.0%	0.0%	0.0%	7.3%	2.7%	5.3%	18.9%	100.0%
Rhondda Cynon Taf	3.1%	0.5%	0.0%	1.0%	9.0%	21.4%	8.9%	55.9%	100.0%
Swansea	5.8%	7.8%	1.0%	1.6%	15.3%	29.9%	10.5%	28.0%	100.0%
The Vale of Glamorgan	12.1%	0.7%	0.0%	0.7%	24.3%	28.2%	8.5%	25.5%	100.0%
Torfaen	5.2%	0.0%	0.0%	0.0%	6.2%	16.1%	9.2%	63.3%	100.0%
Wrexham	16.9%	0.4%	0.0%	4.5%	8.1%	25.4%	10.8%	33.9%	100.0%
All Wales	19.1%	2.8%	0.6%	2.9%	12.0%	20.9%	8.2%	33.5%	100.0%

The differences in collection systems were accounted for by including OAC representative samples from all 22 authorities.

There is no published evidence on whether weekly dry recycling composition changes according to whether a fortnightly residual collection takes place. It was therefore agreed that the sample points (households) were only visited in one week and composition averaged across collection cycle, unless the collection of recycling was collected on alternate week to residual waste.

1.1.1 Sample Size

It was important to choose a sample size that would result in composition data that achieves an adequate level of validity i.e. will give information that can be relied upon to give insight about the population generally. Confidence intervals decrease as sample sizes increase. The smaller the confidence interval for a waste fraction, the more accurate the sample mean is as an estimate of the population mean. A well-designed waste analysis study will balance the budgetary constraints with the need to sample and categorise a sufficient amount of waste.

Taking into consideration previous experience on other similar waste composition analysis projects as well as the published guidance on waste analysis from WRAP (*Improving the performance of waste diversion schemes: a good practice guide to monitoring and evaluation*, February 2010) and Zero Waste Scotland (*Guidance on the methodology for waste composition analysis*, December 2013) as well as the aims of the project we recommended that a representative sample 210 households is included in the study for each individual local authority resulting in 4,620 households across Wales per seasonal phase. Typical confidence intervals for a sample of this size, for the whole of Wales, might be expected to be in the +/- 1-2% region, based on previous waste analysis data at the individual household level.

Each LA sample was drawn from 5- 6 sample areas which covered different locations, collection days and key demographics. Only households which residual waste was set out in the week of the analysis were included in the analysis to maximise the sample size.

Food waste was sampled for all households setting out this stream in the sample. Dry recycling where co-mingled or twin stream within the local authority was also collected and sorted.

1.2 HWRCs

A front end analysis of residual waste at HWRCs was employed for this study. This means that the analysis is based on sampling residents visiting the site and analysing their waste individually linking the data with a short questionnaire. As a key element of the overall study was to identify the potential re-usability of the material this front end methodology fits well with maximising data that allows that assessment to be made at the point of disposal and was similar to the methodology employed for the Bulky Waste analysis Resource Futures carried out in 2011¹³

Average throughput for each site, recycling performance, materials and quantities recycled and visitor number were requested as part of the administrative data collection.

The overall sampling strategy for the CA sites was based on the geographical spread, recycling performance and the throughput of the sites. The analysis was split between weekday and weekend days to capture differences (if any) in the weekend and weekday streams. Overall a day was spent on 22 sites across Wales resulting in a sample of between 960 to 1,200 visitors (the 2009 study analysed between 40-50 samples a day).

1.3 Commercial waste collected by the local authorities

A selection of local authorities representing different geographical locations and rurality were approached to take part in the analysis of commercial waste. The final sample of local authorities included:

- Pembrokeshire
- Swansea
- Newport
- Conway
- Wrexham

Random samples of around 1 tonne of waste were extracted from the back of collection vehicles which serviced a typical trade waste collection round on the day of the analysis. Around 8 tonnes of material was included in the analysis in each phase.

1.4 Bulky waste

Random samples of bulky waste were assessed for local authorities where the collected material was available for assessment at the transfer station or HWRC visited by the waste analysis team. Overall the assessment was carried out on six sites in phase 1 and

¹³ <http://www.wrap.org.uk/content/study-re-use-potential-household-bulky-waste>

seven in phase 2. Reusability was assessed following the methodology described in Figure 11 but a much smaller number of samples were achieved of bulky waste compared to other materials that are the subject of this report, and the results may be less reliable as a result. As might be expected due to the smaller sample sizes, there was quite wide variation between the two seasons in terms of the proportion of furniture compared to WEEE.

2.0 Primary data collection

2.1 Household opt out letters

All the residents who may have been included in the analysis (including substitute streets) were informed of the work and had an opportunity to opt out. Letters were hand delivered to the relevant sampling frame (streets identified for the analysis) and a number included for any residents who wish to be excluded from the research along with a dedicated email address.

The letter was printed on headed paper with the appropriate logos (WRAP, Welsh Government etc). They included a short description of the work, timescales (two instances until the end of 2015), the confidentiality and anonymous nature of the work and clear instructions on what to do to opt out. A standard rate landline number was included with voice mail facilities so that the residents could call outside office hours and leave their address to opt out or request further details. This was operated and managed by WRAP. Local authority contact numbers were also included on the letter. The addresses that opted out were recorded on the overall sampling data base and when collection sheets were printed for the sample collection the information was included on the fieldwork paperwork. A total of 6.9% of households contacted in the first wave opted out of the study.

2.2 Household waste

2.2.1 Sample collection

Each day, Resource Futures visited the agreed sample collection round and collected the appropriate material (residual, food waste and co-mingled recycling where required) from households, in a non-compacting vehicle provided by ourselves.

Samples were collected from the required number of households setting out residual waste. If a household has not set out residual waste, a substitute household taken.

Each container collected was emptied into a 240 litre bag and marked with a tag denoting material stream and demographic group. No other information was recorded on these tags in order to ensure that residents' confidentiality was protected. Collectors followed the sample round in the order marked on their collection sheet (the data on round order was requested from the LAs), which was structured to ensure that the sampling crew arrived before the usual collection crew. In addition, the collection sheet identified substitute streets, in order to minimise the risks of low set out or alterations in the collection order on the part of the regular collector.

2.2.2 Communication with the public during collections

All collection staff had photographic identification, and teams carried a letter of authority from the relevant Council explaining that they were authorised to carry out the work. In addition, the collection vehicle was equipped with magnetic signs with the logo of the relevant waste collection authority.

2.2.3 Sorting protocol

Each of the streams (residual waste, food waste and co-mingled dry recycling where required) was sorted separately. All collected waste was sorted, rather than a subsample of the waste.

Each sample (demographic group) was hand sorted separately, according to the proposed category list. Material below 10mm particle size was classified as fines, therefore all bags and sacks were opened on the sort table on the 10mm mesh screen. Materials were then separated by hand into the different categories using wheeled bins and kerbside boxes. After each of the samples was sorted, each category of waste was weighed in tared containers using digital scales.

2.3 HWRC waste

2.3.1 Sample collection

A random sampling approach was used for obtaining the samples on site by selecting “next available visitor” methodology. Residents were selected based on when the analysis of a sample was finished avoiding storing the waste or holding the visiting vehicles in a queue.

Each resident was asked for their residual waste items. Their recycling was not included in the analysis.

The following table shows the list of the HWRC sites include in the analysis

Table 14 HWRC sites included in the analysis

LA	Site
Blaenau Gwent	New Vale Ca Site
Bridgend	Tythegston Household Recycling Centre
Caerphilly	Aberbargoed Ca Site
Cardiff	Bessemer Road
Carmarthenshire	Trostre Hwrc
Ceredigion	Glanyrafon
City And County Of Swansea	Baling Plant
Conwy	Mochdre
Denbighshire	Lon Parcwr Ruthin
Flintshire	Flint
Gwynedd	Caerylchu Caernarfon
Isle Of Anglesey	Penhesgyn
Merthyr Tydfil	Dowlais Household Waste & Recycling Centre

Monmouthshire	Llanffoist
Neath Port Talbot	Briton Ferry Hwrc
Newport	Docksway Hwrc
Pembrokeshire	Hermon CA Site
Powys	Newtown
Rhondda Cynon Taff	Treforest
Torfaen	Hwrc New Inn
Vale Of Glamorgan	Llandow Trading Estate, Llantwit Major
Wrexham	Wynnstay Bank, Plas Madoc

2.3.2 Sorting protocol

The sorting took place on site where space at the HWRC permitted. Larger items were weighed and classified on the spot with black bag waste contained. Following the 2009 procedure a sample of black bag waste (around 10 bags) was then selected to ascertain the composition of this type of waste. This was sorted at a designated sorting station as per the household protocol.

2.4 Commercial waste

2.4.1 Sample collection

Samples were delivered by the normal collection crews in an RCV. Only the waste in Pembrokeshire was collected by Resource Futures team as the majority of the businesses present the waste in bags.

2.4.2 Sorting protocol

The sorting protocol followed that of the kerbside collected residual waste with the same category list used for the work.

2.5 Bulky waste

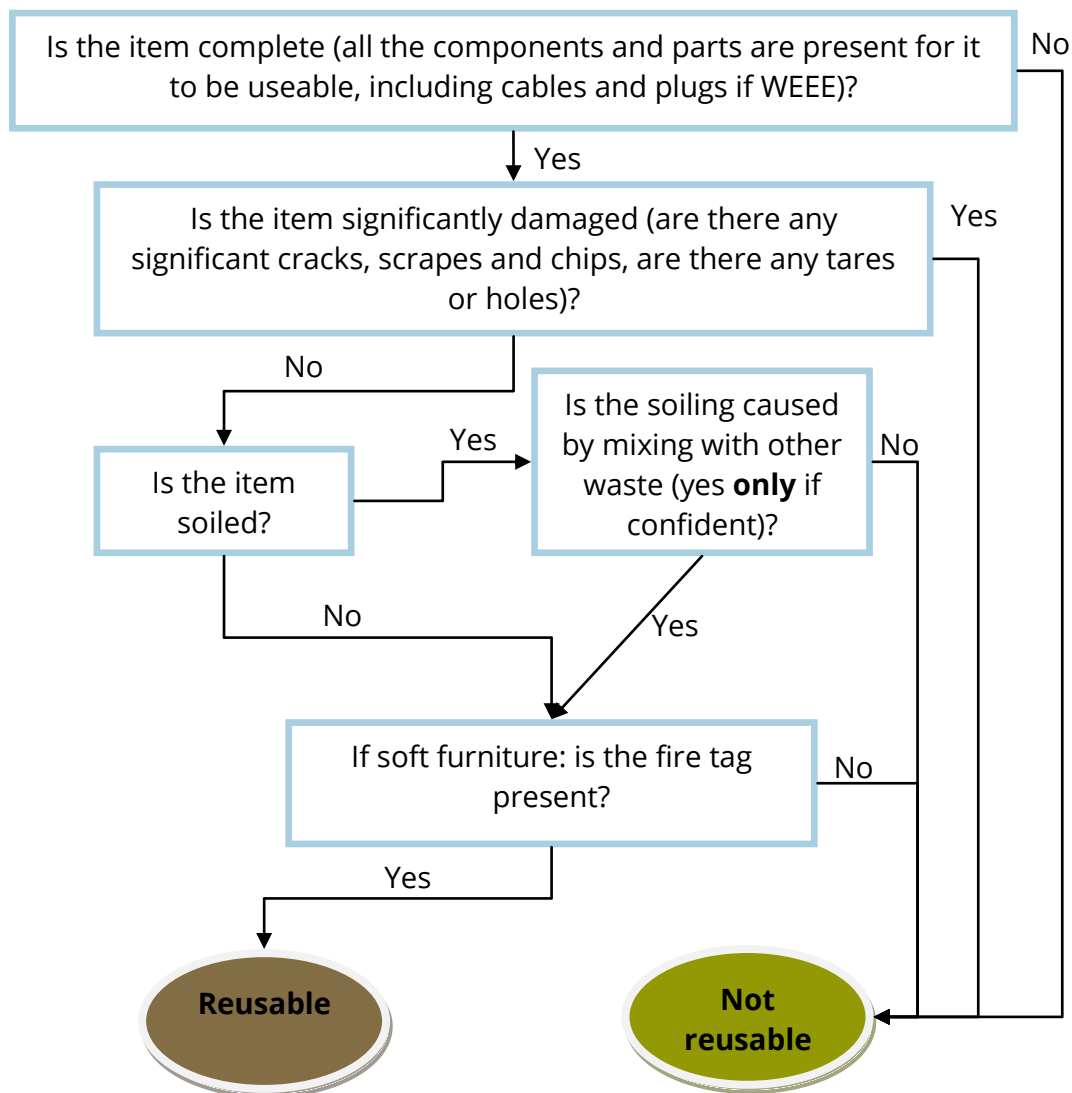
All items were classified to an agreed category list and their potential reusability based on a simple visual assessment. No testing of electrical items was carried out and the items were assessed based on the condition they were presented i.e. after the collection by the regular collection crew.

2.6 Material categorisation

Waste was sorted according to an agreed category list. The list was designed to allow analysis of recyclable potential, biodegradability, reusability as well follow best practice on the classification of food waste. The detailed category list alongside the recyclability and biodegradability classification is included in Appendix 3.

The reusability was assessed based on the following flow chart:

Figure 10 Reusability assessment flow chart



For paint the assessment was based on:

- Is the paint water-based (check for hazardous symbols on the can)?
- Is the paint still liquid (shake can)
- Is the can in good condition (not rusty, damaged, has the lid on etc)?
- Is the can more than half full (assessment based on shaking and weight in the hand)?

3.0 Analysis and reporting

3.1 Data management and analysis

All data was entered into electronic data collection spreadsheets and quality checked for 100% accuracy. The experienced fieldwork managers then sense checked the data for any outliers and unusual items that would have been flagged up by the site managers on the paperwork.

3.1.1 Data assumptions

WasteDataFlow data is not available immediately which means that the composition data could not be attributed to the same quarter/season. The most recent available data (2014/15) was used for the calculations presented in this report. This means that some data on the recycling had to be extrapolated using neighbouring authorities (in terms of demographics and collection services) as some of the Councils have changed their recycling services in the last year (for example for Swansea Vale of Glamorgan recycling data was used and for Merthyr Tydfil Torfaen dry recycling composition was used).

Wrexham reported their dry recycling as co-mingled even though they collect the material via a multi-stream system. Composition from Flintshire was used to extrapolate.

In four instances the food waste figures were reported combined with green garden waste. For three of these authorities arisings per household per week obtained from the waste analysis were used to estimate total arisings. The food waste service in Wrexham was in the process of changing – introduction of separate food waste using caddies as opposed to the use of green garden waste bins. The rounds selected for sampling have had the initiative rolled out however judging by the very low set out of the food waste caddies this behaviour has not been fully adopted. To estimate the food waste tonnage figures more accurately the split of the organic material in mixed organic collection services developed by Resource Futures for WRAP was used for the estimation (WRAP project CFP302).

It was assumed that there was no contamination within the figures reported for the multi-material collection services as they rely on crews sorting the items on the kerbside.

Where tonnage figures were available for mixed material stream (e.g. paper and card) the figures were split according to the average ratio of these materials where data was available (e.g. recyclable paper made up 62% of the recyclable paper and card in the co-mingled services, on average).

The HWRC samples are based on a front end analysis and it is therefore difficult to sort a large proportion of the bagged material that is brought by the residents, and this was in some cases substantial. Samples of this material were taken and sorted and that composition was applied to the total weight of bagged material. The results are based on visiting one site per authority and surveying the waste over one day. The results are therefore a snapshot of behaviour and this should be taken into account when viewing the individual local authority data.

Similarly bulky waste was surveyed where possible and the data obtained comes from a selection of authorities. However it should give a fair estimation of the nature of the material.

During the final analysis all material reported separately was aligned to main category level. In the small number of instances where co-mingled recycling materials were reported the average kerbside co-mingled composition was used to estimate.

Compositions were assumed from the following sources for the residual waste streams not included in the analysis:

Table 15 Assumptions for the composition of the residual waste streams

Residual waste type	Assumption/data	2014/15 weight tonnes
Asbestos Waste separately collected	100% Hazardous	370.94
Beach cleansing	Similar to Street cleaning	144.26
Civic amenity sites waste : Household	Primary data 2015	96,922.53
Civic amenity sites waste : Non Household	Similar to HH CA	2,640.30
Collected gully emptyings	Similar to sweepings, 2015 primary data	8,687.65
Collected household waste : Bulky Waste	Primary data 2015	5,257.10
Collected household waste : Other	Similar to kerbside collected HH waste	11,237.96
Collected household waste : Regular Collection	Primary data 2015	433,075.91
Collected household waste : Street Cleaning	DEFRA 2011 compositional estimates	44,167.08
Collected non-household waste : Commercial & Industrial	Primary data 2015	68,859.99
Collected non-household waste : Construction and Demolition	100% non-combustible	240.29
Collected non-household waste : Grounds Waste	Similar to Street cleaning	564.50
Collected non-household waste : Highways waste	Similar to Street cleaning	1,051.74
Collected non-household waste : Other	Similar to kerbside collected HH waste	5,144.30
Other collected waste	Similar to kerbside collected HH waste	8,413.55
Separately collected healthcare waste	100% Other combustible AHPs	1,090.88
Waste Arising from clearance of fly-tipped materials	Unpublished RF report	2,031.55

Appendix 2 Category list

Main Categories	Sub-categories	Comments	Widely recyclable	Biodegradable
1. Paper and Card	Recyclable paper	news and mags, junk mail, household/office paper, envelopes, books, catalogues, directories	1	100
	Thin card	cereal boxes, tea boxes, greeting cards	1	100
	Corrugated card	large boxes and cardboard sheets	1	100
	Drink cartons (Tetrapacks)	juice boxes, UHT milk	1	90
	Kitchen roll and tissues	tissues and wipes but not the polyester variety		100
	Food contaminated P&C	pizza boxes, chip shop paper		100
	Waxed/laminate/wet strength P&C	coffee cups, takeaway trays lids		100
	Other non recyclable paper and card	wall paper, photo paper		100
2. Plastic Film	Carrier bags			0
	Recyclable plastic film	Bubble wrap, bread bags		0
	Other plastic film	inc black bags		0
3. Dense Plastic	Plastic bottles	All types	1	0
	PTTs	All types not black plastic trays	1	0
	Other dense plastic	toys, pipes, hangers, black plastic, pvc, plastic furniture		0
4. Textiles	Clothing		1	50
	Shoes, bags, belts		1	50
	Non clothing textiles	rags, sheets, blankets, towels, pillows, sleeping bags, duvets	1	50
5. Other Combustible	Carpet and underlay			50
	Furniture	Wooden and soft furniture, NOT plastic or metal		50
	Mattresses			50
	Absorbent hygiene products (AHPs)	nappies, pads, feminine absorption products		50
	Wood and cork			100

Main Categories	Sub-categories	Comments	Widely recyclable	Biodegradable
	Other combustible			50
6. Other Non-Combustible	Other non-combustible	inert materials, ceramics, crockery, rubble, plasterboard, clay cat litter		0
7. Glass	Glass bottles and jars		1	0
	Glass non-packaging	drinking glasses, pane glass		0
8. Putrescibles	Garden waste	inc straw pet bedding from herbivores pets (guinea pigs, hamsters, rabbits)	1	100
	Soil			90
	Unavoidable food waste	bones, gristle, cheese wax, nut shells, fruit stones; pineapple, banana, avocado, melon skin, fruit cores, fruit stalks, tops and stalks of veg except broccoli, cauliflower, mushrooms, garlic/ginger/onion peel, teabags, coffee grounds, egg shells, sprouting potato	1	100
	Possibly avoidable food waste	bread crusts and endslices, fat from meat, fish skin; apple, citrus, plum, peach peel; carrot, potato, courgette, tomato peel; mushroom cauliflower, broccoli stalks; herb stalks, used cooking oil; pie, pizza, sandwich crusts.	1	100
	Avoidable food waste (unpackaged)	cooked and prepared meals, whole fruit, veg, fruit&veg flesh, whole coffee products, unused teabags, cakes, bread slices, whole loaves, rolls, unused oils, margarine/butter, confectionary, condiments, meat & fish cooked and raw	1	100
	Avoidable food waste (packaged)	as above but packaged.	1	100
	Other organic	pet litter inc wooden cat litter, unidentifiable		100
9. Ferrous Metal	Ferrous cans and tins		1	0

Main Categories	Sub-categories	Comments	Widely recyclable	Biodegradable
	Ferrous aerosols		1	0
	Other ferrous items	pans, tools, cutlery, pipes, metal furniture		0
10. Non Ferrous Metal	Non Ferrous cans		1	0
	Non Ferrous aerosols		1	0
	Alu foil	inc foil trays	1	0
	Other non ferrous	pans, tools, cutlery, pipes, non ferrous furniture		0
11. Waste Electrical and Electronic Equipment	White goods	fridge fridges, washing machines, microwave		0
	Other electrical items	Toasters, kettles, hair and beauty, chargers, toys, cables, lamps, vacuum cleaners, power tools		0
	Computers and televisions	CRP and flats screen, desktop computers laptops		0
	Other large electronic items	printers, scanners, dvd, video, audio, instruments		0
	Mobile phones			0
	Other small electronic items	keyboards, laptops, games, phones		0
12. Potentially Household Hazardous Waste Items	Water based paint cans	Only paint easily identifiable as water based (empty tins in metal or plastic)		0
	Other paint cans	All other paint		0
	Batteries		1	0
	Other Hazardous Waste	chemicals, medicine		0
13. Fine Material	<10 mm Fines			50

Appendix 3 Local Authority data introduction

The data included in this spreadsheet was prepared by Resource Futures for the national municipal waste analysis in Wales in 2015. The analysis was carried out over two phases of the work

The following data includes the individual composition of the residual waste, food waste and co-mingled dry recycling (where applicable) as well as the composition of other streams tested in the Local Authority.

The compositions are for the two phases of the work:

- Phase 1 – summer 2015
- Phase 2 – winter 2015

Kerbside collected streams

Demographically representative samples of around 210 households were collected over a week of analysis (two weeks if the dry recycling was collected fortnightly on the opposite week) over two phases. This is considered robust on the **Main category** level with industry standard and WRAP recommended sample sizes of around 200-250 households.

Output Area Classification was used to construct the sampling strategy. The classification is made out of the following groups:

Supergroup Code	
1	Rural Residents
2	Cosmopolitans
3	Ethnicity Central
4	Multicultural Metropolitans
5	Urbanites
6	Suburbanites
7	Constrained City Dwellers
8	Hard-Pressed Living

Further details can be found at the ONS website.

The data includes the overall composition of the streams analysed as well as the compositions for the individual OAC groups. Please note, as the samples were proportionally split between the demographic groups, some of the groups have only a small number of samples and caution should be exercised when extrapolating the group results to larger population.

HWRC residual waste

The aim of the analysis was to establish composition of HWRC residual waste for Wales as a whole. The analysis was carried out on one of the sites in the local authority over one day in each of the phases. This data is therefore not robust for the authority or the individual site as only a limited amount of data was collected from each site.

The result is based on the analysis of the waste at the point of disposal by the resident. As detailed classification of black bag waste is not possible at this point samples of this material were collected throughout the day, subsequently sorted and the composition applied to the total quantity of black bag waste observed on that day.

Other waste streams

Samples of other materials were analysed across different local authorities in Wales. Those samples were constructed in such a way that a good cross section of authorities and locations in Wales were represented. Caution should be therefore exercised in using the data for individual local authorities.

www.wrapcymru.org.uk/CompositionalAnalysisWales

