

# Commercial and Industrial Waste in Wales



Composition analysis of Commercial and Industrial waste in Wales

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**Front cover photography:** Waste Composition Analysis Fieldwork

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# Executive summary

This study was conducted to provide Welsh Government (WG) and WRAP Cymru up-to-date data on the composition of commercial and industrial (C&I) waste in Wales.

The objectives of the work were to estimate the total C&I waste arisings, analyse the findings by source and material type, and to estimate the proportion of materials which could have been avoided through recycling or composting. The findings will be used to inform policy and the design of relevant interventions.

The methodology applied broadly followed that used in the 2007 study 'Determination of the Biodegradability of Mixed Industrial and Commercial Waste Landfilled in Wales' (Environment Agency Wales, 2007).

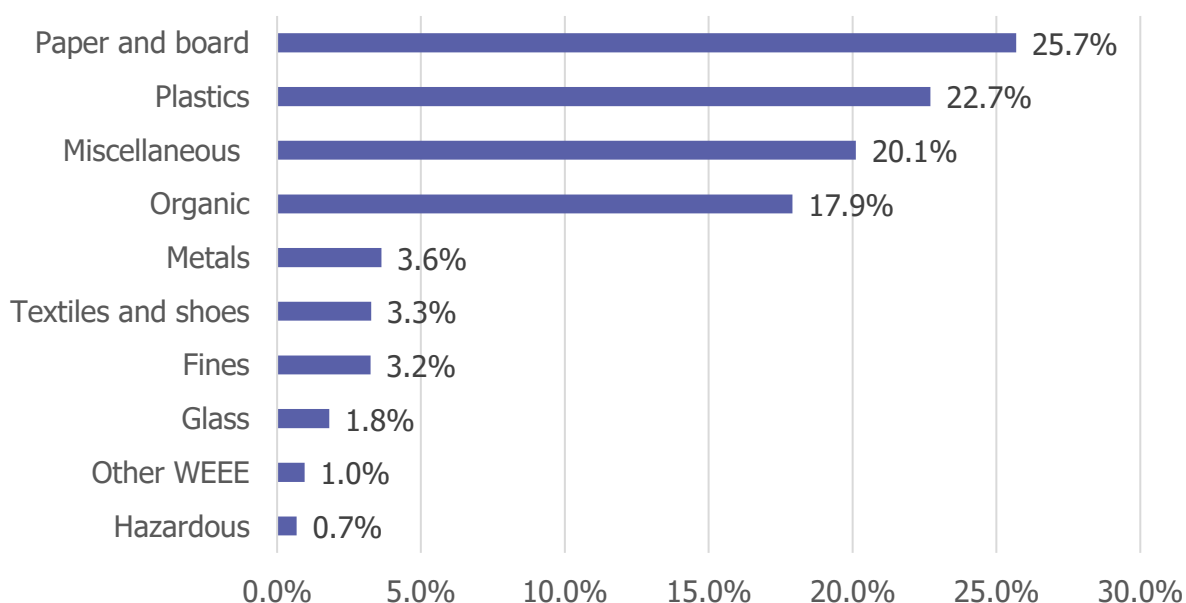
Sampling of commercial and industrial waste was undertaken at four main sites: Pwllfawatkin landfill, Swansea Baling Plant, Cardiff Energy Recovery Facility and Bessemer Close transfer station. Waste sampled at these locations was either received directly from collectors or transferred from other sites. It was not possible to identify a site in the North of the Country with adequate facilities to accommodate fieldwork.

The survey analysed a total of 108 samples: 13 of waste landfilled directly, 60 destined for energy recovery and 35 from transfer stations. Of the samples analysed, 64 could be identified as commercial waste and 6 could be identified as industrial, the remaining 38 were mixed C&I waste. Samples were classified as EWC code 191212 (21) and 200301 (87). In total, 26 tonnes of material was sampled and analysed.

Total quantities of commercial and industrial waste were estimated by subtracting the total input of local authority collected household waste (taken from WasteDataFlow) from the quantity of MSW received at each facility (obtained from Natural Resource Wales Facility Returns). These data were then combined with the composition data to estimate the quantities of different materials.

Results of the composition analysis are summarised in .

**Figure 1: Overall composition of C&I waste in Wales (main category level). N=108**



Paper and board was the most commonly found material, accounting for 25.7% of the C&I waste analysed. A further 22.7% of the material analysed was plastics, while 20.1% was miscellaneous and 17.9% was organic material.

The main changes since 2007 have been an increase in the proportion of plastics and organic matter (by 7.9% and 2.9% respectively)<sup>1</sup> alongside a decrease in the proportion of paper and board and miscellaneous waste (by 6.6% and 3.1% respectively).

The analysis included an assessment of the proportion of the material that was potentially recyclable or compostable. The materials deemed potentially recyclable were aligned with the 2007 report for comparability and are shown in Appendix 4. The majority of the residual waste analysed (74.5% +/- 2.4%, or an estimated 450,478 tonnes annually) could have potentially been avoided. This represents a small decrease from 2007 (with 77% recyclable or compostable found in residual C&I waste).

Of the 452,258 tonnes of materials which could be diverted from the residual waste stream, edible food waste was the most prevalent, with an estimated arising of 68,679 tonnes per annum. As a further 22,062 tonnes of materials were inedible food waste, food waste represented the highest proportion of materials (and 15% of the total waste arisings) which could potentially be diverted from residual waste streams. Packaging film accounted for 54,663 tonnes, cardboard for 40,073 tonnes, and construction and demolition (C & D) waste arisings were estimated at 25,014 tonnes of the total materials which could have been diverted from residual waste streams.

The biodegradability of the average waste was assessed using calculations described in Environment Agency's guidance on the Landfill Allowance Trading Scheme (LATS)<sup>2</sup>, as shown in Appendix 5. The calculated average biodegradability of the waste analysed was 57% (+/- 2%), slightly lower than the 61% (+/- 3%) biodegradability calculated in the 2007 analysis.

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<sup>1</sup> Changes in composition are expressed as changes in the percentage of the total composition (sometimes referred to as "percentage points"), rather than growth relative to a baseline value, unless stated otherwise. For example, an increase from 5% to 10% would be described as an increase of 5% (rather than 100%).

<sup>2</sup> Environment Agency (2006) Guidance on the landfill allowance schemes: municipal waste

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Resource Futures would like to thank the City and County of Swansea, Biffa, FCC and Viridor; as well as the staff at Pwllfawtkin Landfill site, the Swansea Baling Plant, the Cardiff Energy Recovery facility and the Biffa Roath Docks site for their assistance with this project.

## 1.0 Objectives and scope

The Welsh Government and WRAP Cymru required up-to-date data on the composition of residual commercial and industrial (C&I) waste in Wales as the work was last undertaken in 2007.

The scope of the work was restricted to C&I residual waste received at disposal locations in Wales. Where this was identified as being generated from outside Wales, it was excluded from the study as the intention was to identify the amounts of recyclable material present in Welsh residual C&I waste. The project aimed to identify the amounts of recyclable material present in the residual waste stream.

The objectives of the work were to estimate the total C&I waste arisings, analyse the findings by source and material type, and to estimate the proportion of materials which could have been avoided through recycling or composting. The findings will be used to inform policy and the design of relevant interventions.

Additionally, the study aimed to obtain indicative composition for the commercial and industrial streams separately.

## 2.0 Methodology

The study methodology broadly followed the methodology described in the 2007 study 'Determination of the Biodegradability of Mixed Industrial and Commercial Waste Landfilled in Wales' (Environmental Agency Wales, 2007).

### 2.1 Sample strategy development and site selection

#### 2.1.1 Identifying sites receiving C&I waste

In developing the sampling strategy for waste analysis, it was necessary to identify those facilities with a significant input of mixed C&I waste.

These sites were identified based on the data submitted by local authorities (LAs) to WDF question 100 combined with the data submitted by residual treatment facilities to Natural Resources Wales as part of the permitting obligations. The data provided an overview of the total quantities of residual C&I waste disposed via the facilities and the quantities of C&I waste disposed in Wales.

The method used to estimate the inputs of mixed C&I waste at individual facilities was the subtraction of local authority collected household waste from known total mixed waste deposits, as shown in the formula below.

$$[\text{mixed C\&I input at facility}] = [\text{total recorded mixed waste input}] - [\text{LA household waste input}].$$

Facility returns, completed by site operators for Natural Resource Wales, gave total inputs of mixed waste into facilities for the year 2017. Landfill sites, Energy from Waste plants and transfer stations were included in the analysis.

The inputs of local authority collected household waste for disposal during 2017 were obtained from the WasteDataFlow database, within which local authorities record all waste sent to disposal facilities on a quarterly basis.

Only waste recorded as EWC codes 19.12.12 and 20.03.01 was included in the analysis in line with the 2007 work. Waste disposed of directly after collection from the producer is coded 20.03.01, while that passing through a transfer station or treatment facility before disposal is coded 19.12.12. The EWC codes are defined as follows:

- 19.12.12 (other wastes (including mixtures of materials from mechanical treatment of wastes other than those mentioned in 19 12 11))
- 20.03.01 (mixed municipal wastes)

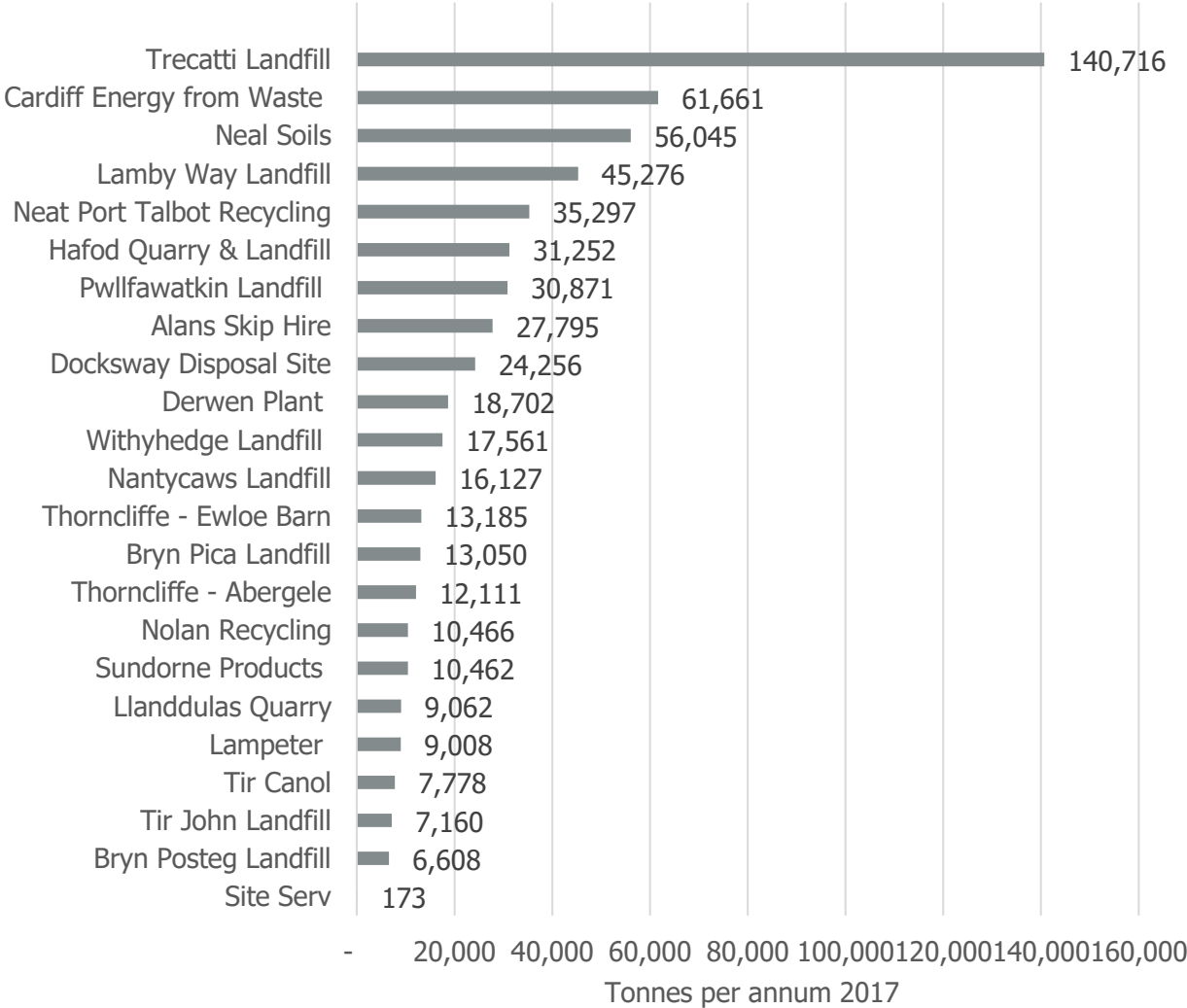
Waste records within the facility returns which could be identified as originating from an English local authority were excluded from the analysis.

Based on the data analysed, the total amount of C&I waste originating in and being disposed of in Wales under waste codes 19.12.12 and 20.03.01 was 604,623 tonnes in 2017.

The 2007 work estimated the total amount of C&I waste disposed of to be 686,000 tonnes.

Estimated inputs of mixed C&I waste per site based on the 2017 data analysed are shown in the figure below and in Appendix 1.

**Figure 2: Estimated inputs of mixed C&I waste**





### 2.1.2 Selection of facilities for sampling

Once the inputs of mixed C&I waste had been estimated, sites were contacted to verify the estimates and determine their suitability to accommodate waste composition analysis. Several sites did not have any suitable facilities to safely carry out waste analysis, which led to their exclusion from the project. In choosing sites for initial contact, priority was given to those thought to be accepting a significant tonnage of mixed C&I waste, as identified above.

Following initial contact, it became clear that there were differences between the data analysed and the actual site inputs. For example, the Lamby Way landfill has been closed for 2 years, and the Trecatti landfill is mainly accepting inert waste. This is thought to be mainly due to the fact that the data is over two years old and is reliant on accurate reporting from the operator.

More up-to-date data was sought from Natural Resource Wales and, following further discussion, the following sites were identified as most suitable for inclusion:

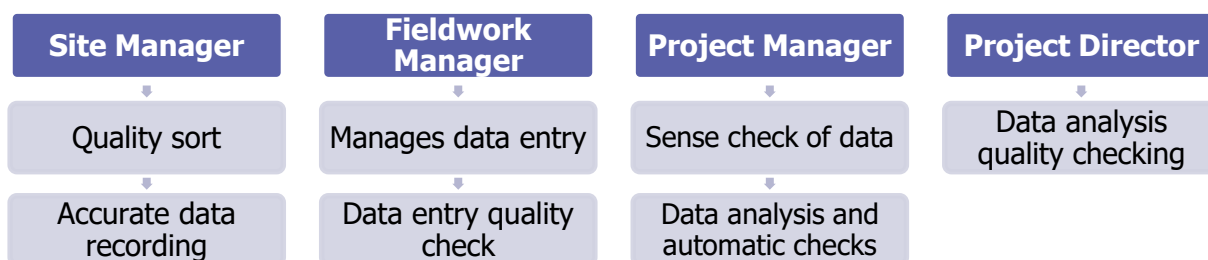
- Landfill: Pwllfawatkin
- Energy recovery: Cardiff Energy from Waste
- Transfer stations: Swansea Baling Plant & Biffa Bessemer Close<sup>3</sup>

The 2007 study targeted the four largest facilities with one in the North of the Country and three in the South. It was not possible to identify a site in the North of the Country, mainly for health and safety reasons. Hafod Landfill and Quarry facility was willing to be included but lacked adequate facilities to accommodate fieldwork.

Ahead of the sampling, each site was contacted to discuss the project and the assistance required from the site (sample extraction, sorting space, H&S).

## 2.2 Data management

Figure 3 below illustrates the process used for data collection, verification and analysis, and the responsibilities attributed to each role involved in the management of survey data.



**Figure 3: Data Management Process and Responsibilities**

### 2.2.1 Sampling and analysis of the material

As in the 2007 study, the sampling strategy was based on analysis of 250kg samples, with a target of 160 samples. The strategy was based on proportional stratified sampling where the numbers of samples required from each facility type were proportional to the overall inputs received at the relevant facility types across Wales. Materials were sorted according to

<sup>3</sup> As the fieldwork could not be accommodated at the Bessemer Close site it was actually undertaken at the Biffa Roath Docks site

materials categories agreed with Welsh Government, Natural Resources Wales and WRAP Cymru prior to the fieldwork. See Appendix 2 for details.

The sampling and analysis at each of the sites was staffed by teams of experienced, independent waste analysis technicians. The survey site manager liaised with each facility's weighbridge staff to select target commercial and industrial loads arriving at the site, based on relevant EWC codes as noted in the associated waste transfer documentation. Data were recorded during the on-site analysis using carefully designed datasheets.

The origin of each load sampled, the waste collector and, where possible, the business sector (commercial or industrial) was recorded at each survey site. As samples tended to include waste from more than one source, a detailed analysis by Standard Industrial Classification (SIC) code was not possible. The relationship between sample composition and its origin was based on anecdotal information collected during the fieldwork. Where possible, loads were recorded as either commercial or industrial, and were recorded as mixed C&I where it was not possible to attribute materials to an individual category. As a result of the limited sources of information provided to classify waste origin, it was difficult to determine with certainty whether the waste was of industrial or commercial origin. Only a small number of samples were attributed purely to industrial sources and therefore data relating to industrial waste composition be regarded as indicative rather than definitive.

The (survey) site manager supervised the extraction of 250kg samples from each load and their delivery of samples to the sorting teams. A variety of loads were selected to ensure the sampling was representative of the facility input. Samples were pre-weighed before being sorted by material category, for quality control purposes. The site manager checked that sort accuracy was within 5% for each sample.

The waste analysis technicians then analysed wastes based on the agreed material categories. All bags and sacks were opened, and the contents sorted. The weight of each category was obtained using calibrated digital scales and the results for each sample were then recorded by the (survey) site manager.

### *2.2.2 Data Checking*

The fieldwork manager was then responsible for the entry of composition and collection data into spreadsheets and quality checked data entered for 100% accuracy. The project manager then sense checked the data for any outliers and the category allocation of unusual items that were flagged up by the site managers on the datasheets. Raw data has been provided in an Appendix 3.

Data analysis was carried out by the project manager and checked for quality by the project director. Data analysis was carried out in MS Excel following good practice guidance endorsed by WRAP<sup>4</sup>.

### *2.2.3 Data analysis*

The combined composition of the C&I waste analysed was calculated by taking the average composition from all samples taken across the four sites included in the study. Analysis by sector, EWC code and sampling point was also carried out.

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<sup>4</sup> WRAP, 2010. *Improving the performance of waste diversion schemes – A good practice guide to monitoring and evaluation (WRAP Project EVA092-000)*. Report prepared by Resource Futures and WRAP, Banbury, WRAP.

The analysis included an assessment of the proportion of the material that was potentially recyclable or compostable. The materials deemed potentially recyclable were aligned with the 2007 report for comparability and are shown in Appendix 4.

The biodegradability of the average waste was assessed using calculations described in Environment Agency's guidance on the Landfill Allowance Trading Scheme (LATS)<sup>5</sup>, as shown in Appendix 5. Materials such as food waste, garden waste, paper and wood are considered 100% biodegradable, while materials such as clothing, mattresses, carpets and nappies are considered 50% biodegradable. The biodegradability factor for each sub-category was applied to the composition to determine the overall biodegradability of the sample.

All confidence intervals were calculated using 95% significance level.

### 3.0 Results

#### 3.1 Samples included

The samples analysed at each site are shown below in Table 1.

**Table 1: Breakdown of samples achieved by site**

| Site                                  | No. of samples | Sorted (kg)   | Average sample (kg) |
|---------------------------------------|----------------|---------------|---------------------|
| Pwllfawatkin Landfill Site            | 13             | 3,316         | 255                 |
| Swansea Baling Plant                  | 21             | 4,848         | 231                 |
| Trident Park Energy Recovery Facility | 60             | 14,470        | 241                 |
| Biffa Roath Dock                      | 14             | 3,391         | 242                 |
| <b>Total</b>                          | <b>108</b>     | <b>26,024</b> | <b>241</b>          |

In total 108 samples were analysed. An estimated 250kg was sampled from each load, the actual average sample weights are shown in the table above.

The main reason for the reduced number of samples analysed was time lost due to numerous samples of suspected asbestos being found within samples, particularly at Pwllfawatkin Landfill. The suspected asbestos required laboratory testing during which the analysis was suspended until a result was returned and it was deemed safe to resume.

The distribution of the samples by EWC code and facility type is shown in Table 2 below.

**Table 2: Sample distribution of EWC codes by facility type**

| Row Labels        | 19.12.12. | 20.03.01. | Total      |
|-------------------|-----------|-----------|------------|
| Energy from waste | 12        | 48        | 60         |
| Landfill          | 9         | 4         | 13         |
| Transfer station  | 0         | 35        | 35         |
| <b>Total</b>      | <b>21</b> | <b>87</b> | <b>108</b> |

#### 3.2 Overall C&I Waste Composition

<sup>5</sup> Environment Agency (2006) Guidance on the landfill allowance schemes: municipal waste

The estimated overall composition of commercial and industrial waste in Wales is shown in Table 2. These results are based on all 108 samples.

**Figure 4: Composition of C&I residual waste (EWC 19.12.12 & 20.03.01) in Wales. N=108**

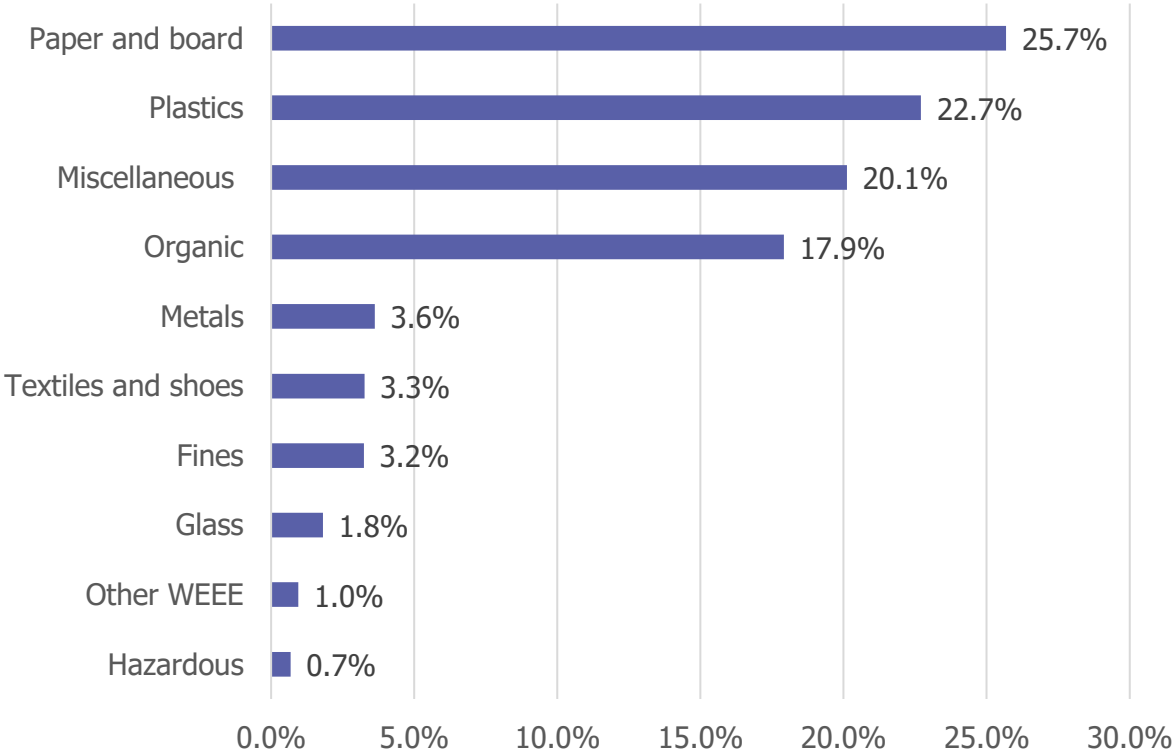


Figure 4 above shows the composition of C&I waste in Wales at the main category level.

Paper and board was the most commonly found material, accounting for 25.7% of the C&I waste analysed. A further 22.7% of the material analysed was plastics, while 20.1% was miscellaneous and 17.9% was organic material.

Biodegradability is discussed in section 3.3, and the potentially recyclability of the material is discussed in section 3.4

The differences between the 2007 and 2019 data are shown in section 3.8.

Table 6 below shows the composition of C&I waste in Wales at sub-category level and is shown in the same format used in 2017 for ease of comparison.

**3.3 Biodegradable content**

The calculated average biodegradability of the waste sampled was 57% (+/-2%).

This is slightly lower than the 61% (+/- 3%) biodegradability calculated in the 2007 study.

The results suggest that the biodegradability of non-household C&I waste in Wales has reduced slightly since 2007, perhaps due to factors such as improved food waste diversion. However, due to the level of uncertainty associated with the results, it is not possible to state that there is a significant difference between biodegradability in 2007 and 2019.

### 3.4 Potentially recyclable content

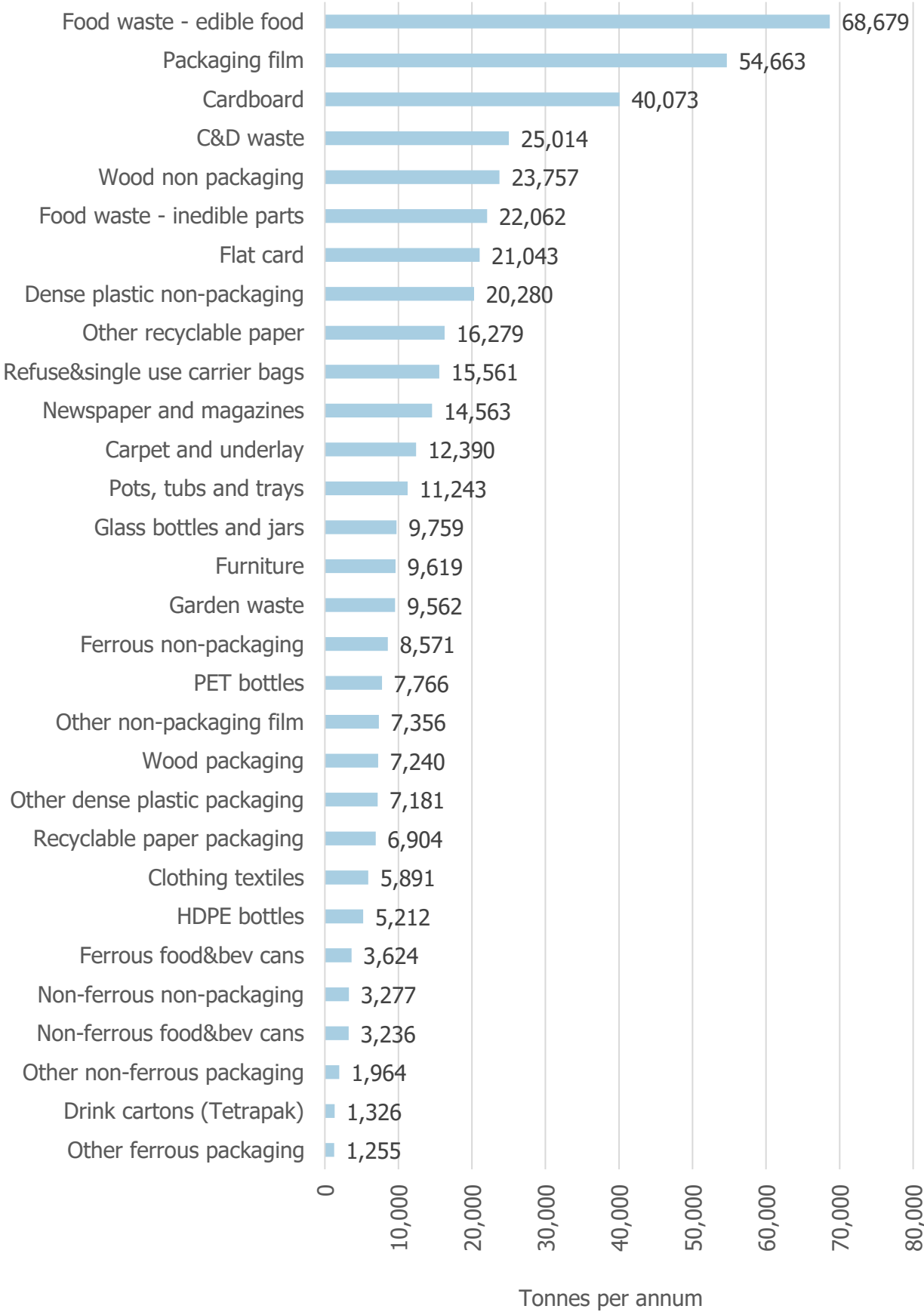
The majority of the waste analysed (74.5% (+/- 2.4%) or 450,478 tonnes annually) could have potentially been recycled.

This is lower than in 2007, when the proportion which could potentially have been recycled was 77% and an estimated 530,000 tonnes of recyclable materials were going to landfill. The estimated arisings of C&I waste in Wales were applied to the overall composition of the samples analysed to estimate the annual tonnage which could be potentially diverted to recycling. The materials deemed potentially recyclable were aligned with the 2007 report for comparability.

The estimated annual tonnage of each material within Welsh C&I waste which could potentially be diverted for recycling is shown in Figure 5 below.

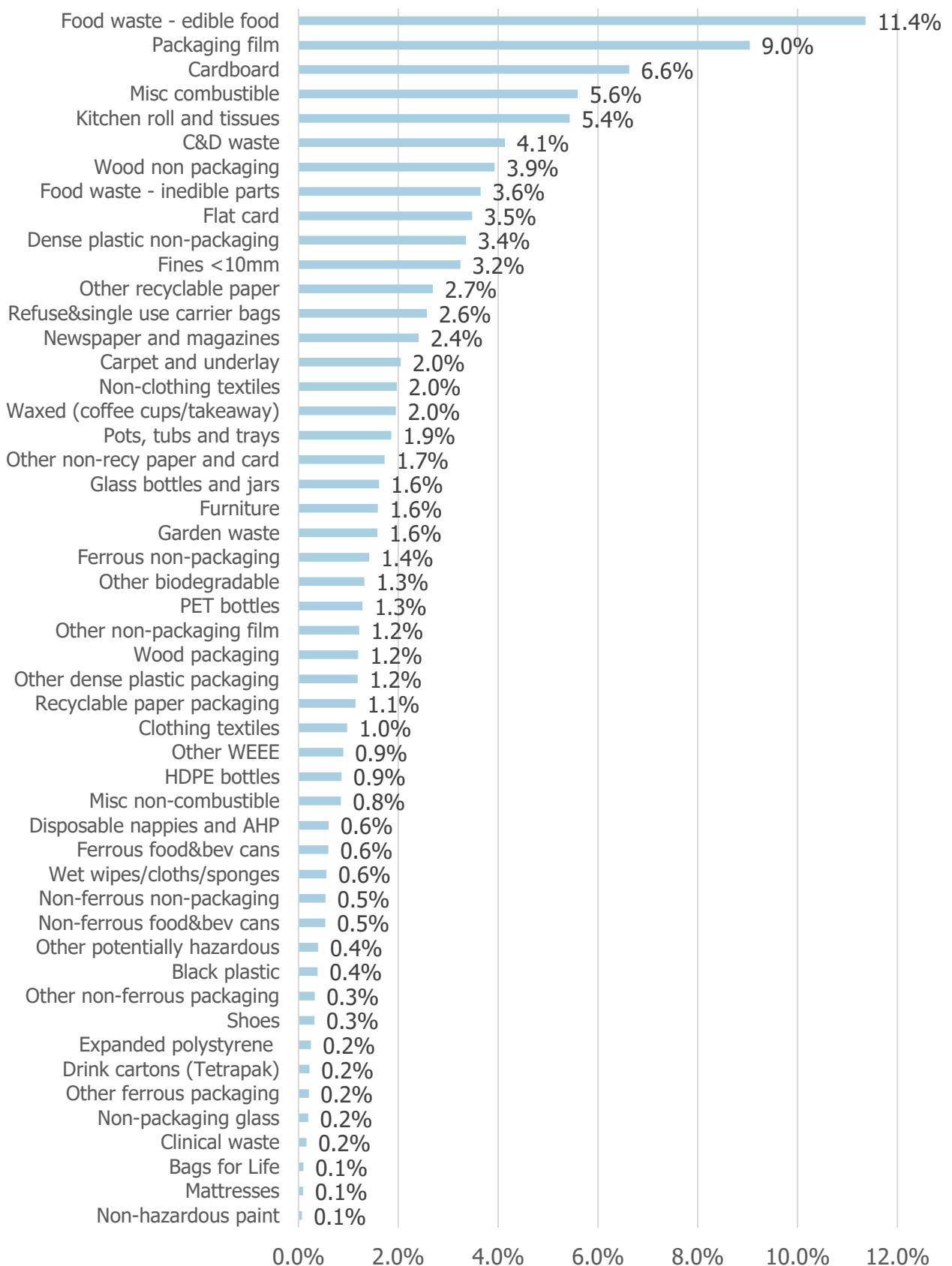
The most common material which could have been diverted from the residual waste stream was edible food waste, with an estimated arising of 68,679 tonnes per annum. As a further 22,062 tonnes was inedible food waste, therefore food was the most significant material in terms of opportunities to reduce residual waste. Packaging film accounted for an estimated 54,663 tonnes, cardboard for 40,073 tonnes and wood waste for another 30,997 tonnes.

**Figure 5: Annual tonnage of recyclable materials in residual C&I waste (EWC 19.12.12 and 20.03.01) arising in Wales. N=108**



The composition by subcategory material is shown in Figure 6 below.

**Figure 6: Composition of C&I residual waste (EWC 19.12.12 & 20.03.01) in Wales (subcategory level). N=108**

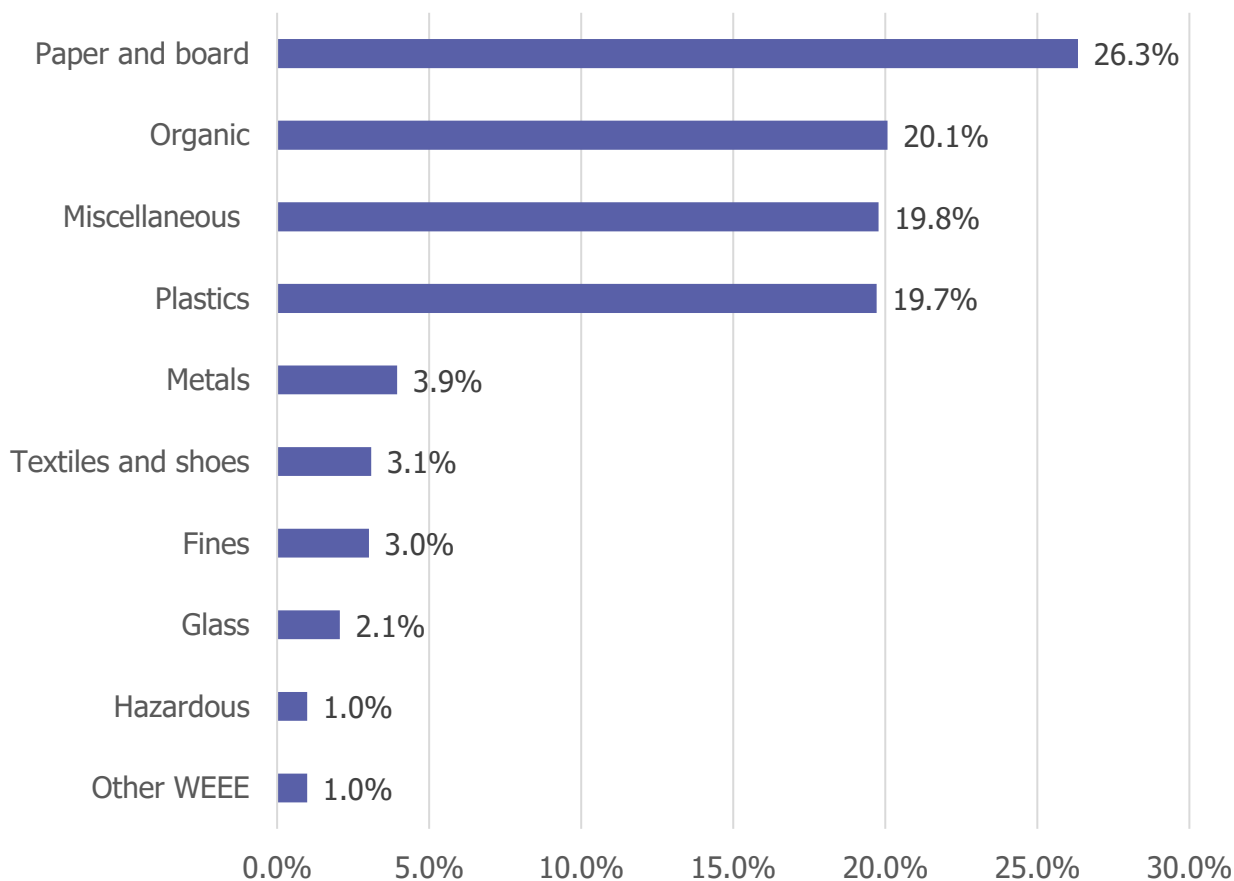


### 3.5 Analysis by sector

### 3.5.1 Commercial waste

The composition of the samples analysed which were identified as commercial waste only has been shown below. These results are based on 64 samples.

**Figure 7: Composition of commercial residual waste (EWC 19.12.12 & 20.03.01) in Wales. N=64**



Paper and board was the most commonly found material (26.3%), followed by organic waste (20.1%), miscellaneous waste (19.8%) and plastics (19.7%).

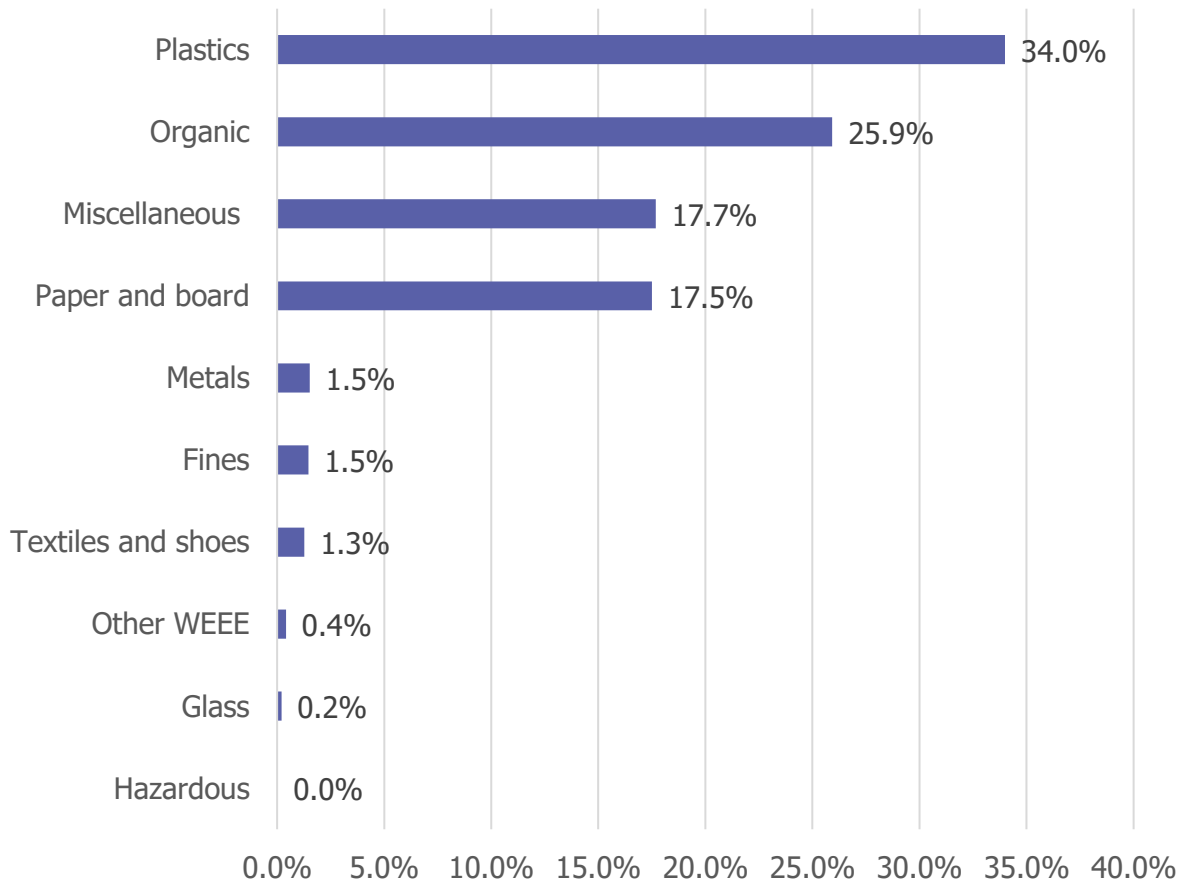
### 3.5.2 Industrial waste

The composition of the samples analysed which were identified as industrial waste only has been included below.

This information should be treated with caution, as it has been based on a limited number (6) of samples, half of which were assumed to have originated from food production facilities. This is likely to have overestimated the proportion of food waste.



**Figure 8: Composition of industrial residual waste (EWC 19.12.12 & 20.03.01) in Wales. N=6**



Plastic was the most commonly found material (34.0%), followed by organic waste (25.9%), miscellaneous waste (17.7%) and paper and board (17.5%).

### 3.5.3 Biodegradability and recyclability

The biodegradability and potential recyclability of the waste analysed is shown in Table 3 below.

**Table 3: Recyclability and biodegradability of commercial and industrial residual waste (EWC 19.12.12 & 20.02.01) in Wales**

|            |                  | Average | STDEV.S | C.I. 95% |
|------------|------------------|---------|---------|----------|
| Commercial | Recyclability    | 74.0%   | 13.8%   | 3.4%     |
|            | Biodegradability | 60.5%   | 10.7%   | 2.6%     |
| Industrial | Recyclability    | 80.5%   | 10.9%   | 8.7%     |
|            | Biodegradability | 48.7%   | 11.0%   | 8.8%     |

The average proportion of the commercial waste analysed which was potentially recyclable or compostable was 74.0% (+/- 3.4%). The biodegradable content of the commercial waste was calculated to be 60.5% (+/-2.6%).

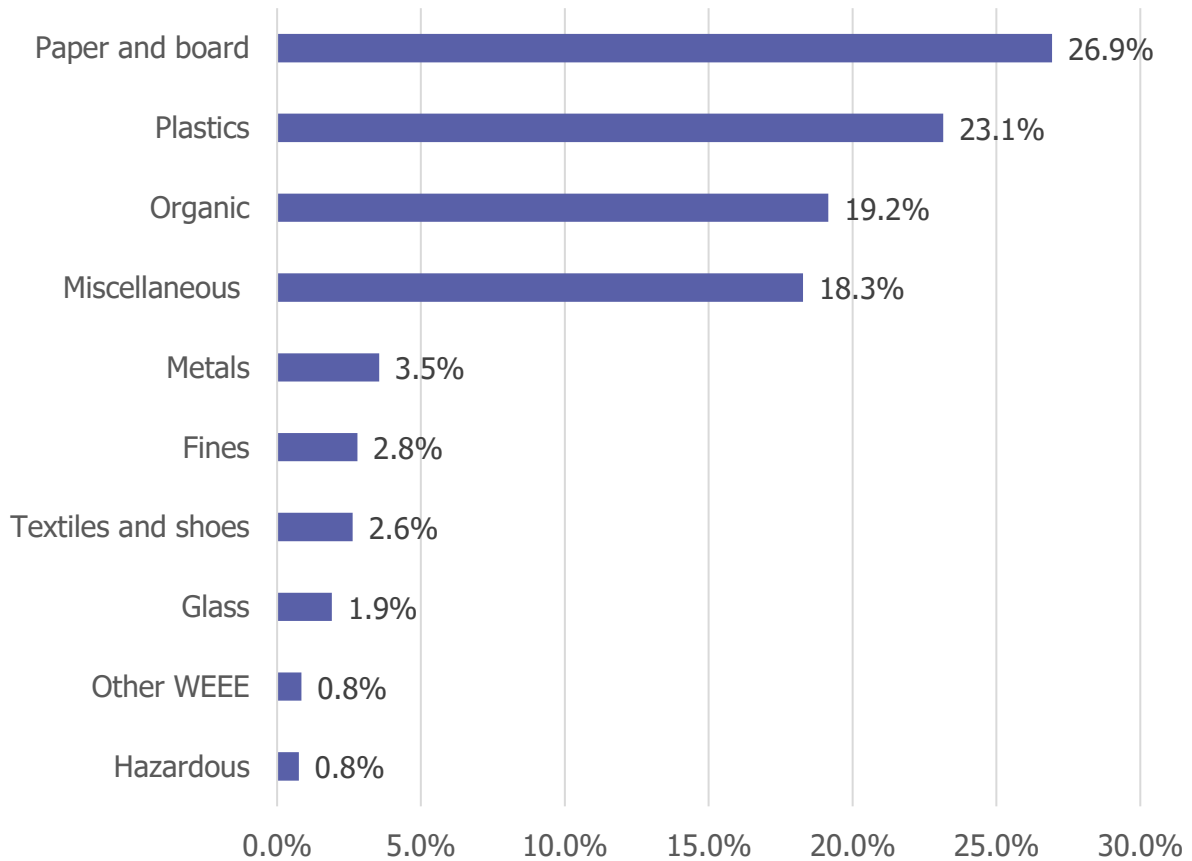
The average proportion of the industrial waste analysed which was potentially recyclable or compostable was 80.5% (+/- 8.7%). The biodegradable content of the industrial waste was calculated to be 48.7% (+/-8.8%).

### 3.6 Analysis by EWC Code

#### 3.6.1 20.03.01 C&I waste

The composition of the samples (N = 87) classified as EWC code 20.03.01 (mixed municipal waste) from trade sources are shown below.

**Figure 9: Composition of 20.03.01 C&I residual waste in Wales. N=87**

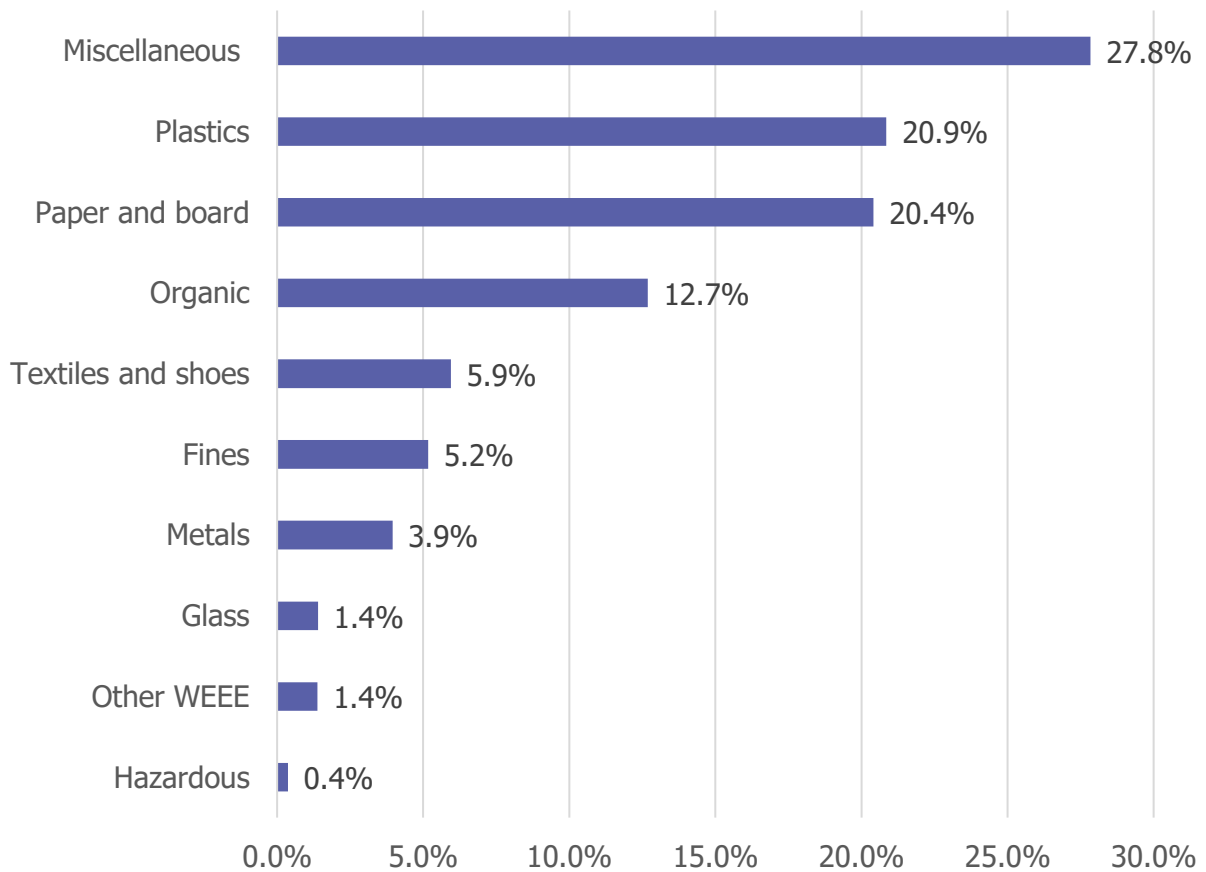


Paper and board was the most commonly found material (26.9%), followed by plastics (23.1%) organic waste (19.2%) and miscellaneous waste (18.3%).

#### 3.6.2 19.12.12 C&I waste

The composition of the samples classified as EWC code 19.12.12 (other wastes (including mixtures of materials from mechanical treatment of wastes other than those mentioned in 19.12.11)) are shown below. These results are based on 21 samples.

**Figure 10: Composition of 19.12.12 residual C&I Waste in Wales. N=21**



Miscellaneous waste was the most commonly found material (27.8%) followed by plastics (20.9%), paper and board (20.4) and organic waste (12.7%).

### 3.6.3 Biodegradability and recyclability

The biodegradability and potential recyclability of the waste analysed is shown in Table 4 below.

**Table 4: Recyclability and biodegradability of samples by EWC code**

|           |                  | Average | STDEV.S | C.I. 95% |
|-----------|------------------|---------|---------|----------|
| 20.03.01. | Recyclability    | 75.0%   | 13.2%   | 2.8%     |
|           | Biodegradability | 58.6%   | 11.9%   | 2.5%     |
| 19.12.12. | Recyclability    | 72.3%   | 9.0%    | 3.8%     |
|           | Biodegradability | 51.9%   | 10.7%   | 4.6%     |

The average proportion of 20.03.01 waste analysed which was potentially recyclable or compostable was 75.0% (+/- 2.8%). The biodegradable content of 20.03.01 waste was calculated to be 58.6% (+/-2.5%).

The average proportion of 19.12.12 waste analysed which was potentially recyclable or compostable was 72.3% (+/- 3.8%). The biodegradable content of 19.12.12 waste was calculated to be 51.9% (+/-4.6%).

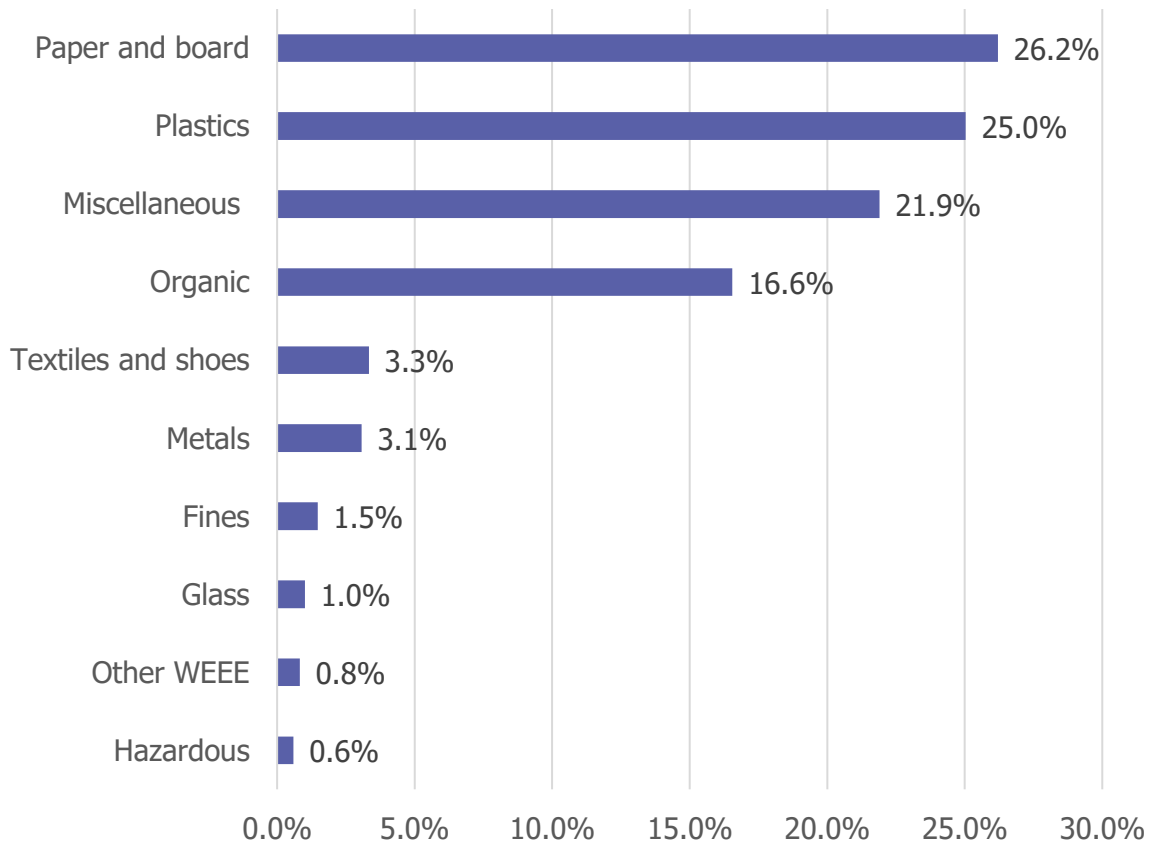
Waste classified as 19.12.12 had a lower biodegradable fraction than waste classified a 200301 (51.9% and 58.6% respectively).

### 3.7 Analysis by waste sampling point

#### 3.7.1 Energy from waste

The composition of the samples analysed which were destined for energy recovery are shown below. These results are based on 60 samples.

**Figure 11: Composition of C&I residual waste (EWC 19.12.12 & 20.02.01) to Energy from waste in Wales. N=60**



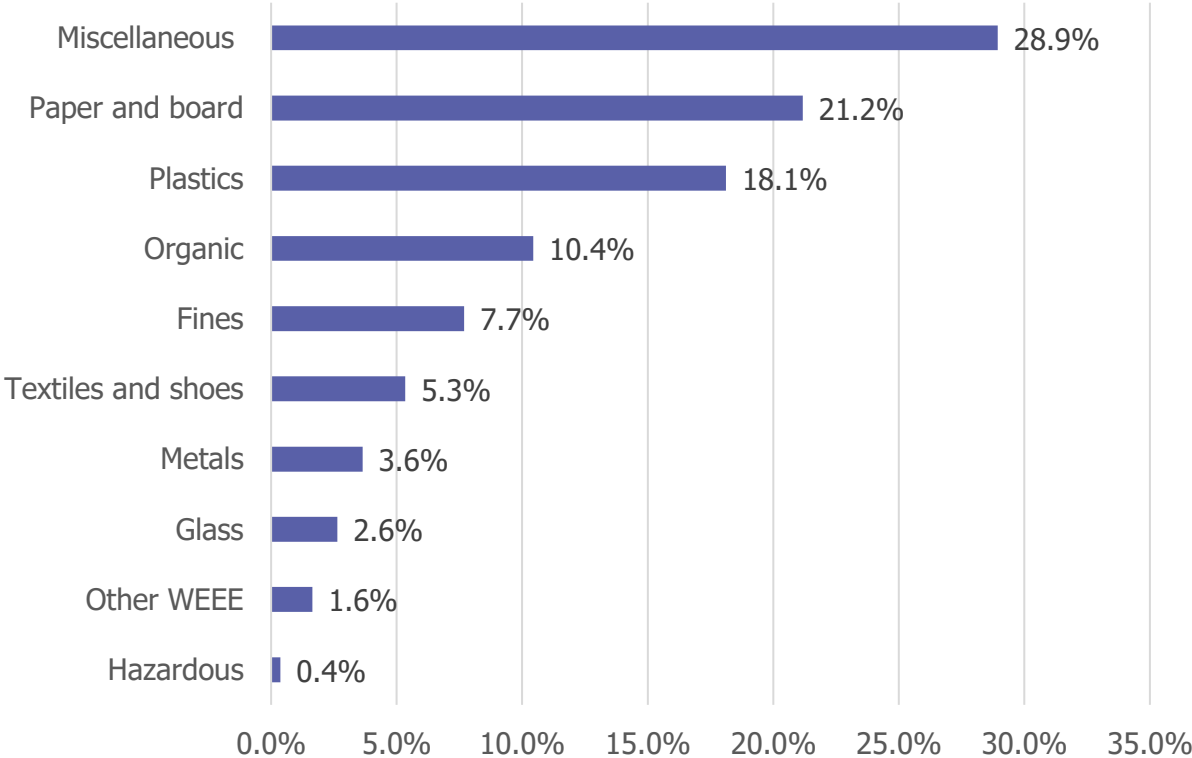
Paper and board was the most commonly found material (26.2%), followed by plastics (25.0%) organic waste (16.6%) and miscellaneous waste (21.9%).

#### 3.7.2 Landfill

The composition of the samples (N = 13) collected at landfill site has been shown below.

Miscellaneous waste was the most commonly found material (28.9%) followed by paper and board (21.2%), plastics (18.1%) and organic waste (10.4%).

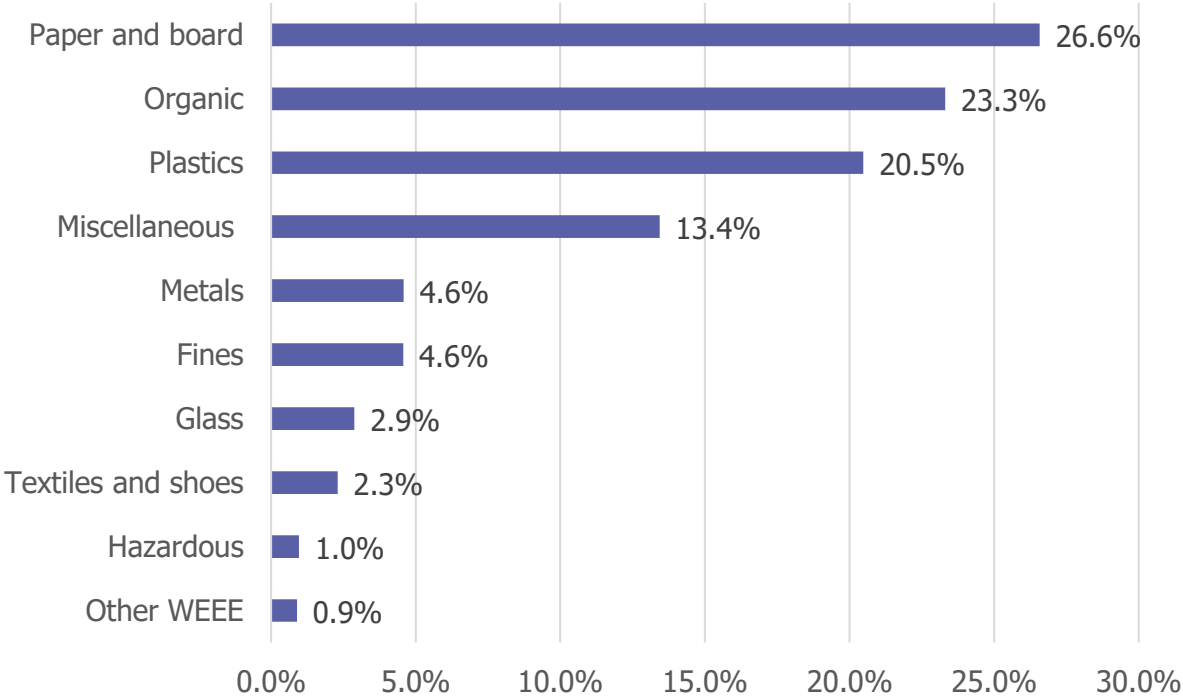
**Figure 12: Composition of C&I residual waste (EWC 19.12.12 & 20.02.01) to landfill in Wales. N=13**



*3.7.3 Transfer station*

The composition of the samples analysed (N = 35) which originated from transfer stations have been shown below.

**Figure 13: Composition of transfer station C&I residual waste (EWC 19.12.12 & 20.02.01) in Wales. N=35**

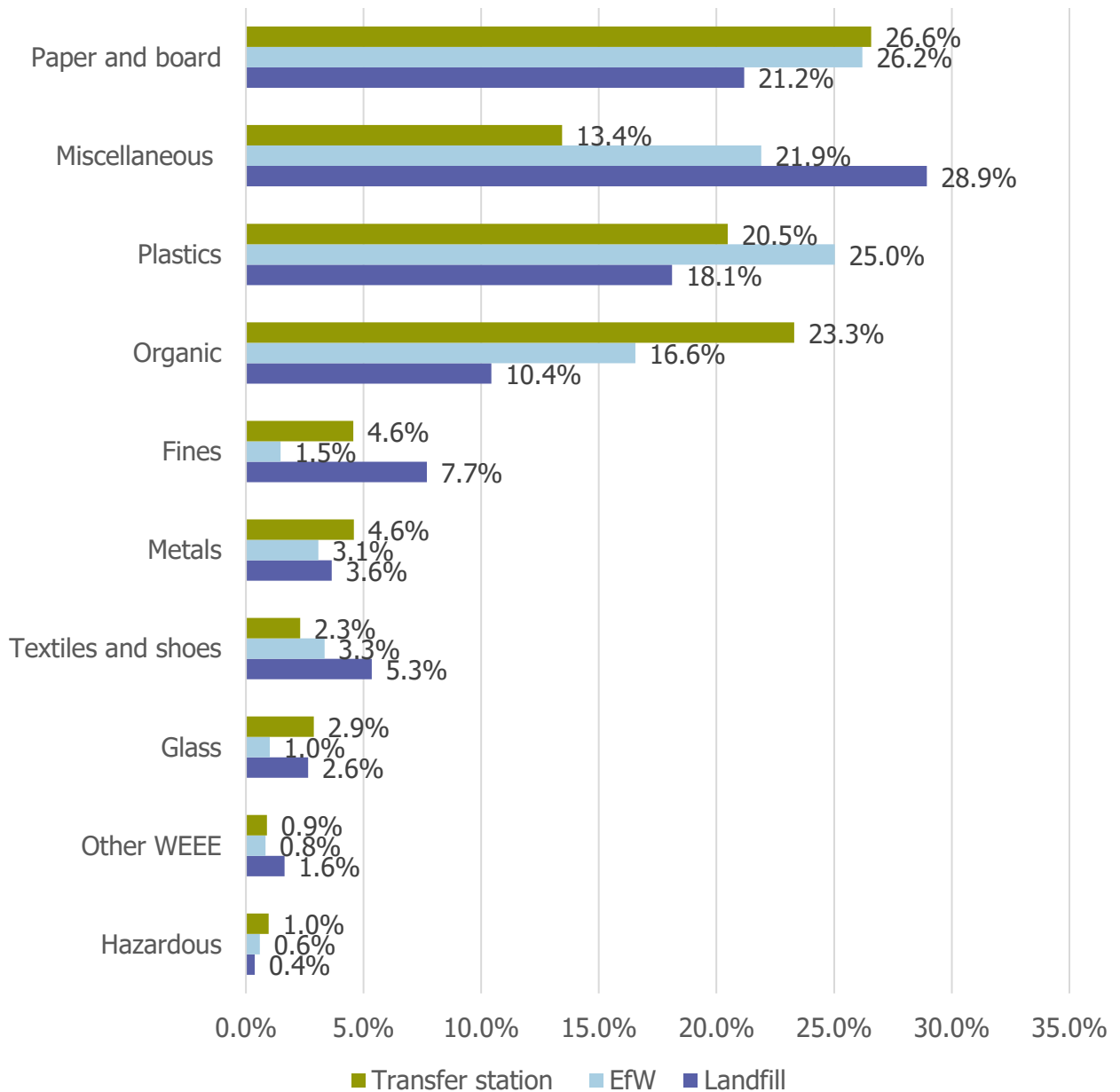


Paper and board was the most commonly found material (26.6%), followed by organic waste (23.3%), plastics (20.5%) and miscellaneous waste (13.4%).

### 3.7.4 Comparison

The composition of waste from all three facility types is shown in the figure below.

**Figure 14: Composition of C&I residual waste (EWC 19.12.12 & 20.02.01) in Wales by sampling point**



Less than half the waste sampled at landfill sites was biodegradable (at 49%), in comparison to waste sampled at transfer stations, of which 60% was found to be biodegradable.

### 3.8 Headline changes since 2007

The composition of the waste analysed in 2007 and 2019 is shown in the table below.

**Table 5: Composition of C&I residual waste in Wales (EWC 19.12.12 & 20.02.01) in 2007 and 2019 (%)**

| Category           | Composition 2007 (%) | Composition 2019 (%) |
|--------------------|----------------------|----------------------|
| Paper and board    | 32.3%                | 25.7%                |
| Plastics           | 14.8%                | 22.7%                |
| Miscellaneous      | 23.2%                | 20.1%                |
| Organic            | 15.0%                | 17.9%                |
| Metals             | 4.4%                 | 3.6%                 |
| Textiles and shoes | 1.7%                 | 3.3%                 |
| Fines              | 3.4%                 | 3.2%                 |
| Glass              | 3.5%                 | 1.8%                 |
| Other WEEE         | 1.1%                 | 1.0%                 |
| Hazardous          | 0.6%                 | 0.7%                 |
| <b>Total</b>       | <b>100.0%</b>        | <b>100.0%</b>        |

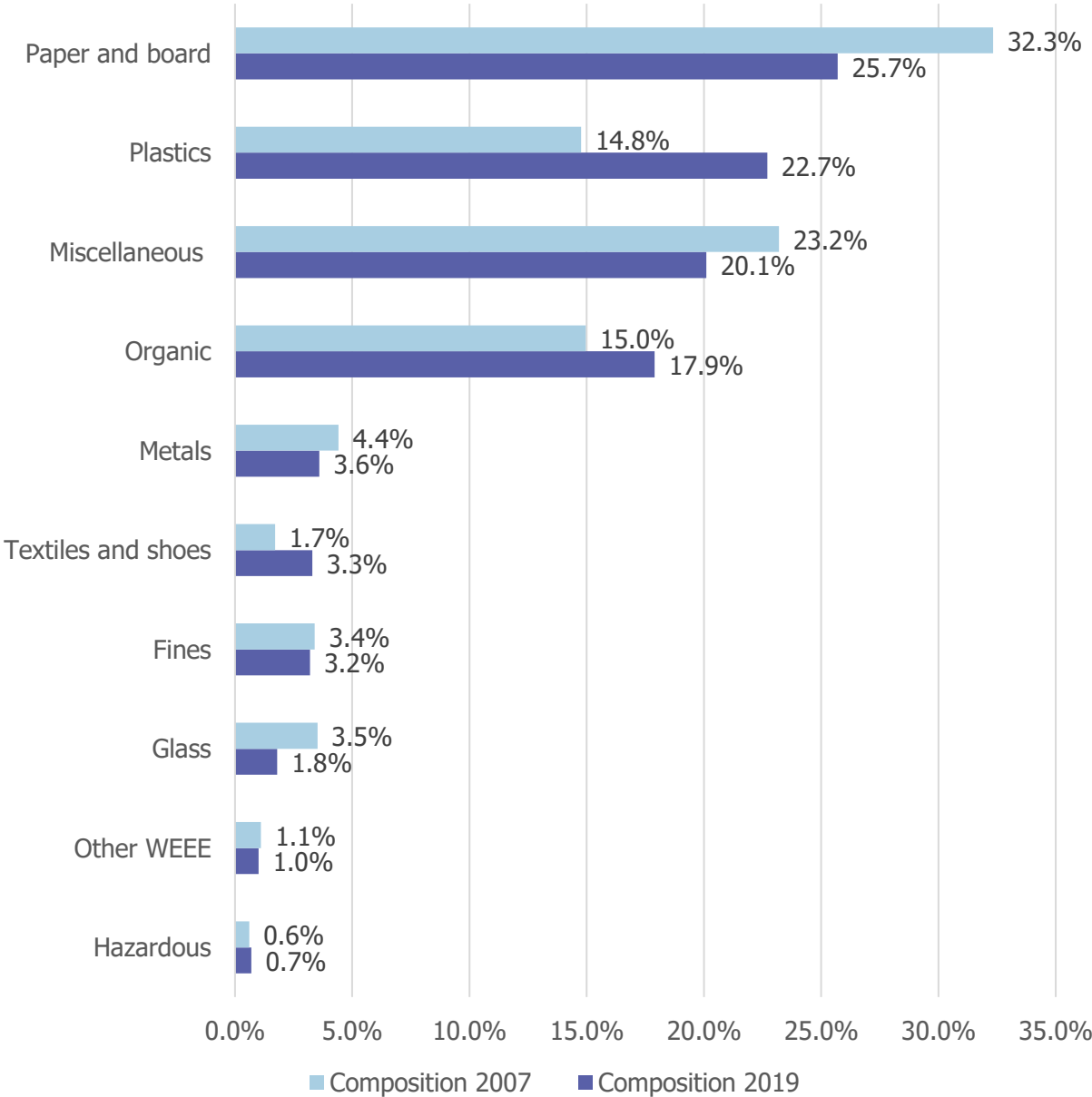
The main changes since 2007 have been an increase in the proportion of plastics and organic matter (7.9% and 2.9% respectively) alongside a decrease in the proportion of paper and board and miscellaneous waste (6.6% and 3.1% respectively).

The estimated tonnage of each main category, in 2007 and 2019, is shown in Table 6 below.

**Table 6: Estimated arisings of C& I residual waste (EWC 19.12.12 & 20.02.01) in Wales in 2007 and 2019**

| Category           | Estimated arisings 2007 (t) | Estimated arisings 2019 (t) |
|--------------------|-----------------------------|-----------------------------|
| Paper and board    | 221,779                     | 155,388                     |
| Plastics           | 101,247                     | 137,249                     |
| Miscellaneous      | 159,102                     | 121,529                     |
| Organic            | 102,624                     | 108,228                     |
| Metals             | 30,305                      | 21,766                      |
| Textiles and shoes | 11,709                      | 19,953                      |
| Fines              | 23,324                      | 19,348                      |
| Glass              | 24,106                      | 10,883                      |
| Other WEEE         | 7,576                       | 6,046                       |
| Hazardous          | 4,133                       | 4,232                       |
| <b>Total</b>       | <b>686,000</b>              | <b>604,623</b>              |

**Figure 15: Composition of residual C&I waste (EWC 19.12.12 & 20.02.01) in Wales in 2007 and 2019**



**4.0 Conclusions**

The amount of C&I waste classified as 191212 or 200301 arising in Wales was estimated to be 604,623 tonnes per annum. This is similar to the findings of the 2007 work, which estimated the total amount of C&I waste disposed of to be 686,000 tonnes. It should be noted that the data used is reliant on accurate reporting from the operator.

The analysis included samples which could be identified as commercial waste, samples which could be identified as industrial waste, and samples of mixed commercial and industrial waste. The results for the industrial waste should be treated with caution as they are based on only 6 samples of which 3 were food producers. This is likely to have overestimated the proportion of food waste. The industrial samples contained a higher proportion of plastics and organic waste than the commercial samples analysed, and a lower proportion of glass, metals and textiles.



The majority of the waste analysed (74.5%, or 450,478 tonnes annually) could have potentially been diverted from residual waste. This is lower than in 2007, when the proportion which could potentially have been recycled was 77% and an estimated 530,000 tonnes of recyclable materials were going to landfill. The main changes since 2007 have been an increase in the proportion of plastics and organic matter (7.9% and 2.9% respectively) alongside a decrease in the proportion of paper and board and miscellaneous waste (6.6% and 3.1% respectively).

There is an opportunity to increase the diversion of commercial packaging. Cardboard and card packaging accounted for 61,117 tonnes in 2019. Whilst this is a large improvement on the 101,000 tonnes found in 2007, more of this material should be diverted for recycling. A large reduction in paper was observed – from 63,000 in 2007 to 37,745 in 2019. This may reflect the increased use of electronic records. Plastic use seemed to have increased. Packaging film accounted for an estimated 54,663 tonnes, an increase on the 35,000 tonnes found in 2007. Plastic bottles accounted for 12,978 tonnes in 2019, and 11,000 tonnes in 2007.

Other changes included a reduction in wood (39,000 in 2007 and 30,997 in 2019) and C & D waste (25,014 tonnes, less than the 34,000 tonnes found in 2007). These materials could all be diverted for recycling.

The most common material which could have been diverted from residual waste was food waste, which accounted for 90,741 tonnes overall. Edible food waste had an estimated arising of 68,679 tonnes per annum, while 22,062 tonnes of C&I waste arisings were inedible food waste. Food waste represented the largest proportion (at 20%) of the fraction found with potential to be diverted from residual waste and 15% of the total C&I waste arisings. As the estimated amount of kitchen waste in 2007 was 90,000 tonnes, it appears that the arising of food waste has changed very little in the last 12 years. Further work assessing the opportunity for increasing the diversion of food waste to AD should be undertaken.

The food waste content of the waste contributes significantly to both recyclability and biodegradability. The calculated average biodegradability of the waste analysed was 57% (+/- 2%), slightly lower than the 61% (+/- 3%) biodegradability calculated in the 2007 analysis but not significantly. Reducing the proportion of food waste is key in reducing the biodegradable content of the waste.

The waste composition also varied at different types of facilities. The waste samples destined for landfill had the lowest biodegradable content<sup>6</sup>, 49%, while the highest biodegradable content was found in transfer station samples (60%). Similarly, landfill waste contained the lowest proportion of organic waste<sup>7</sup> (10.4%), followed by EfW (16.6%) and transfer stations (23.3%). These differences may be partly attributable to moisture loss and breakdown of biodegradable content as the waste sampled on arrival to landfill appeared to be the oldest and subject to more mechanical handling.

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<sup>6</sup> Includes organic waste (as defined below) and other partly or fully biodegradable materials, see Appendix 5.

<sup>7</sup> Main waste composition analysis category including food waste, garden waste and other organic matter such as pet excrement.

## Appendix 1 – Estimated inputs of mixed C&I waste

Facility returns, completed by site operators for Natural Resource Wales, gave total inputs of mixed waste into facilities for the year 2017. Once the inputs of mixed C&I waste had been estimated (by subtracting WasteDataFlow tonnages), sites were contacted to verify the estimates. It became clear that there were differences between the data analysed and the actual site inputs. This is thought to be mainly because the data is over two years old and is reliant on accurate reporting from the operator. The data below should therefore be treated with caution - please see section 2.1 for full information about this data before use.

| Name                        | Site  | Total recorded mixed waste input | LA input | C&I input estimate |
|-----------------------------|---|----------------------------------|----------|--------------------|
| Trecatti Landfill           | Biffa Waste Services Ltd, Trecatti Landfill Site, Fochriw Road, Merthyr Tydfil, Mid Glamorgan                 | 140,811                          | 95       | 140,716            |
| Cardiff Energy from Waste   | Viridor Waste Management Ltd Cardiff Energy Recovery Facility, Trident Park, Glass Avenue, Ocean Way, Cardiff | 315,214                          | 253,553  | 61,661             |
| Neal Soils                  | Neal Soil Suppliers Ltd Ty To Maen Farm, Newton Rd, Rumney, Cardiff, Glamorgan                                | 71,617                           | 15,572   | 56,045             |
| Lamby Way Landfill          | Cardiff Council Lamby Way Landfill Site, Lamby Way, Rumney Moors, Cardiff, Cardiff                            | 45,322                           | 46       | 45,276             |
| Neath Port Talbot Recycling | Neath Port Talbot Recycling Ltd Materials Recovery & Energy, Crymlyn Burrows, Swansea, West Glamorgan         | 85,569                           | 50,272   | 35,297             |
| Hafod Quarry & Landfill     | Cory Environmental (Central) Ltd Hafod Quarry And Landfill Site, Bangor Road, Wrexham Borough                 | 52,458                           | 21,206   | 31,252             |
| Pwllfawatkin Landfill       | WRG Waste Services Ltd Pwllfawatkin Landfill Site, Rhydyfro, Pontardawe, West Glamorgan                       | 39,098                           | 8,227    | 30,871             |
| Alans Skip Hire             | Alans Skip Hire North West Ltd Redwither Road, Wrexham Industrial Estate, Wrexham, Wrexham                    | 27,929                           | 134      | 27,795             |
| Docksway Disposal Site      | Newport City Council Docksway Disposal Site - Phase 2, Docks Way, Maesglas, Newport, South Wales              | 32,306                           | 8,050    | 24,256             |
| Derwen Plant                | Derwen Plant Limited Neath Abbey Wharf, Neath, Neath Port Talbot  | 26,040                           | 7,338    | 18,702             |

| Name                      | Site  | Total recorded mixed waste input | LA input | C&I input estimate |
|---------------------------|---|----------------------------------|----------|--------------------|
| Withyhedge Landfill       | SITA UK Limited Withyhedge Landfill, Bowlings House, Rudbaxton, Haverfordwest, Pembrokeshire                    | 36,526                           | 18,965   | 17,561             |
| Nantycaws Landfill        | C W M Environmental Ltd Nantycaws Landfill Site, Llanddarog Road, Nantycaws, Carmarthen, Carmarthenshire        | 47,726                           | 31,599   | 16,127             |
| Thornccliffe - Ewloe Barn | Thornccliffe Building Supplies Ltd Ewloe Barn Industrial Estate, Mold Road, Alltami, Mold, Flintshire           | 48,778                           | 35,593   | 13,185             |
| Bryn Pica Landfill        | Cynon Valley Waste Disposal Company Ltd, Bryn Pica Landfill Site, Llwydcoed, Aberdare, Rhondda-Cynon-Taff       | 15,228                           | 2,178    | 13,050             |
| Thornccliffe - Abergele   | Thornccliffe Building Supplies Ltd, Gofer, Rhuddlan Road, Abergele, Conwy                                       | 30,460                           | 18,348   | 12,111             |
| Nolan Recycling           | Nolan Recycling Ltd, The Old Quarry, Stormy Down, Pyle, Bridgend, Glamorgan                                     | 11,368                           | 901      | 10,466             |
| Sundorne Products         | Sundorne Products Limited, Unit 41, Port of Pembroke, Pembroke Dock, Pembs, SA72 6TD,                           | 21,050                           | 10,588   | 10,462             |
| Llanddulas Quarry         | 3C Waste Limited, Llanddulas Quarry, Abergele Road, Llanddulas, Abergele  | 26,635                           | 17,573   | 9,062              |
| Lampeter                  | L A S Waste Ltd L A S Waste, Tregaron Road, Lampeter, Ceredigion  | 13,657                           | 4,649    | 9,008              |
| Tir Canol                 | JLA Disposal Limited, Tir Canol, Palleg Road, Lower Cwmtwrch, Swansea   | 8,229                            | 451      | 7,778              |
| Tir John Landfill         | Swansea City Waste Disposal Co Ltd, Tir John Landfill, Ferryboat Close, Swansea Enterprise Zone, West Glamorgan | 40,053                           | 32,893   | 7,160              |
| Bryn Posteg Landfill      | Sundorne Products (Llanidloes) Ltd, Bryn Posteg Landfill Site, Tylwch Road, Llanidloes, Powys                   | 30,184                           | 23,576   | 6,608              |
| Site Serv                 | Site Serv Ltd, Unit 2 Llandow Trading Estate, Llandow, Cowbridge, Vale Of Glamorgan                             | 2,108                            | 1,935    | 173                |

## Appendix 2 – Material Categorisation

| Category        | Sub-category                             | Description  |
|-----------------|--|--|
| Paper and board | Newspaper and magazines                  | Newspapers, magazines, leaflets etc  |
| Paper and board | Recyclable paper packaging               | Clean paper bags and packaging paper, envelopes, including low grade and brown paper                               |
| Paper and board | Other recyclable paper                   | All white office paper including envelopes   |
| Paper and board | Cardboard                                | Corrugated cardboard boxes and sheets  |
| Paper and board | Flat card                                | Thin card boxes, cereal boxes, tea boxes   |
| Paper and board | Waxed paper (coffee cups, takeaway lids) | Coffee cups, drinks cups, paper plates, sandwich boxes, takeaway containers, baking paper, deli bags, soup sachets |
| Paper and board | Drink cartons (Tetra Pak)                | Soup, milk and juice cartons   |
| Paper and board | Kitchen roll and tissues                 | Paper towels, tissues, kitchen roll  |
| Paper and board | Other non-recyclable paper and card      | Photos, wallpaper etc  |
| Plastics        | PET bottles                              | PET bottles  |
| Plastics        | HDPE bottles                             | HDPE bottles   |
| Plastics        | PP bottles                               | PP bottles   |
| Plastics        | Other bottles                            | Any other bottles  |
| Plastics        | Pots, tubs and trays                     | All PTTS   |
| Plastics        | Wet wipes and cleaning cloths / sponges  | All wet wipes, cleaning cloths and sponges   |
| Plastics        | Expanded polystyrene                     | Electronic item packaging, kebab boxes, disposable cups, peanuts etc   |
| Plastics        | Black plastic                            | Any black plastic items  |
| Plastics        | Other dense plastic packaging            | Blister packs, black plastic   |
| Plastics        | Dense plastic non-packaging              | Toys, pipes, hangers, PVC, plastic furniture   |
| Plastics        | Packaging film                           | Bubble wrap, bread bags, cling film  |
| Plastics        | Refuse sacks and single use carrier bags | All black bags and carrier bags (bag only)   |
| Plastics        | Reusable plastic bags (Bags for Life)    | All bags for life  |
| Plastics        | Other non-packaging film                 | Plastic wallets, agricultural film   |

| Category           | Sub-category                       | Description  |
|--------------------|------------------------------------|--|
| Metals             | Ferrous food and beverage cans     | All tins and cans excluding aerosols   |
| Metals             | Non-ferrous food and beverage cans | All tins and cans excluding aerosols and foil  |
| Metals             | Other ferrous packaging            | Ferrous aerosols   |
| Metals             | Other non-ferrous packaging        | Non-ferrous aerosols, foil trays and clean foil  |
| Metals             | Ferrous non-packaging              | All non-packaging scrap ferrous metal  |
| Metals             | Non-ferrous non-packaging          | All non-packaging scrap non-ferrous metals   |
| Organic            | Food waste - edible food           | Cooked and prepared meals; whole fruit and veg; fruit and veg flesh; whole coffee products (pods, bags); unused teabags; cakes: bread - slices, whole loaves, rolls, unused oils, marger/butter, confectionary, condiments, meat & fish cooked and raw; sprouting potato |
| Organic            | Food waste - inedible parts        | 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                  |
| Organic            | Garden waste                       | All woody and green garden waste including cut flowers etc   |
| Organic            | Other biodegradable                | Pet excrement, dead animals, hair, unidentifiable organic matter   |
| Glass              | Glass bottles and jars             | Bottles and jars   |
| Glass              | Non-packaging glass                | Window pane glass, Pyrex items, lab glass, drinking glasses  |
| Textiles and shoes | Clothing textiles                  | All textiles Including clothing, rags etc  |
| Textiles and shoes | Non-clothing textiles              | All non-clothing textiles including carpets, underlay, stuffed and unstuffed household textiles  |
| Textiles and shoes | Shoes                              | All shoes  |
| Other WEEE         | White goods                        | Fridges, washing machines, cookers   |
| Other WEEE         | TVs and monitors                   | Flat screen TVs, computer monitors, CRT screens  |
| Other WEEE         | Large electronic goods             | Computers, printers, servers   |
| Other WEEE         | Other WEEE                         | All other WEEE   |
| Hazardous          | Oil                                | All hazardous oils   |
| Hazardous          | Clinical waste                     | All clinical waste including sharps, excluding offensive waste   |
| Hazardous          | Lead acid batteries                | All lead acid batteries  |

| Category  | Sub-category                         | Description  |
|-----------|--------------------------------------|--|
| Hazardous | Other potentially hazardous          | Any other potentially hazardous  |
| Hazardous | Paint                                | All potentially hazardous paint  |
| Misc.     | Non-hazardous paint                  | Any non-hazardous paint  |
| Misc.     | Wood packaging                       | Pallets, camembert boxes   |
| Misc.     | Wood non packaging                   | Wood lengths, planks, fence panels,  |
| Misc.     | C & D waste                          | Rubble, bricks, concrete, plasterboard   |
| Misc.     | Carpet and underlay                  | All carpet, underlay and rugs  |
| Misc.     | Mattresses                           | All mattresses   |
| Misc.     | Furniture                            | All furniture  |
| Misc.     | Disposable nappies and AHP           | All disposable nappies, including adult AHP  |
| Misc.     | Misc. combustible                    | Mops, multilayer pouches, netting, pill packets, balloons, balls, stuffed toys, DIY combustibles, Hoover bags, soap, candles etc |
| Misc.     | Misc. non-combustible                | Clay cat litter, crockery and ornaments, rocks, ash, traditional lightbulbs  |
| Misc.     | Biodegradable industrial sludges     | Biodegradable sludges  |
| Misc.     | Non-biodegradable industrial sludges | Non-biodegradable sludges  |
| Misc.     | Fines <10mm                          | All materials <10mm  |

## Appendix 3 – Composition of C&I Waste in Wales

| Category        | Sub-category                        | Overall C&I (%) | Commercial Waste (%) | Industrial Waste (%) | 20.03.01 Waste (%) | 19.12.12 Waste (%) |
|-----------------|-------------------------------------|-----------------|----------------------|----------------------|--------------------|--------------------|
|                 | <b>Number of samples:</b>           | <b>N=108</b>    | <b>N=64</b>          | <b>N=6</b>           | <b>N=87</b>        | <b>N=21</b>        |
| Paper and board | Newspaper and magazines             | 2.4%            | 1.9%                 | 0.5%                 | 2.5%               | 2.0%               |
| Paper and board | Recyclable paper packaging          | 1.1%            | 0.9%                 | 4.5%                 | 1.3%               | 0.5%               |
| Paper and board | Other recyclable paper              | 2.7%            | 2.9%                 | 0.6%                 | 2.7%               | 2.7%               |
| Paper and board | Cardboard                           | 6.6%            | 7.1%                 | 4.1%                 | 6.9%               | 5.4%               |
| Paper and board | Flat card                           | 3.5%            | 3.6%                 | 3.5%                 | 3.7%               | 2.6%               |
| Paper and board | Waxed (coffee cups/takeaway)        | 2.0%            | 2.1%                 | 2.6%                 | 2.1%               | 1.5%               |
| Paper and board | Drink cartons (Tetra Pak)           | 0.2%            | 0.3%                 | 0.0%                 | 0.2%               | 0.2%               |
| Paper and board | Kitchen roll and tissues            | 5.4%            | 6.6%                 | 0.9%                 | 5.8%               | 4.0%               |
| Paper and board | Other non-recyclable paper and card | 1.7%            | 1.0%                 | 0.7%                 | 1.8%               | 1.5%               |
| Plastics        | PET bottles                         | 1.3%            | 1.6%                 | 0.3%                 | 1.4%               | 0.9%               |
| Plastics        | HDPE bottles                        | 0.9%            | 1.1%                 | 0.5%                 | 1.0%               | 0.5%               |
| Plastics        | PP bottles                          | 0.0%            | 0.0%                 | 0.0%                 | 0.0%               | 0.0%               |
| Plastics        | Other bottles                       | 0.0%            | 0.0%                 | 0.0%                 | 0.0%               | 0.0%               |
| Plastics        | Pots, tubs and trays                | 1.9%            | 2.1%                 | 1.8%                 | 2.0%               | 1.2%               |
| Plastics        | Wet wipes/cloths/sponges            | 0.6%            | 0.6%                 | 1.0%                 | 0.6%               | 0.6%               |
| Plastics        | Expanded polystyrene                | 0.2%            | 0.2%                 | 0.4%                 | 0.2%               | 0.3%               |
| Plastics        | Black plastic                       | 0.4%            | 0.4%                 | 0.9%                 | 0.4%               | 0.2%               |
| Plastics        | Other dense plastic packaging       | 1.2%            | 0.7%                 | 0.2%                 | 1.1%               | 1.6%               |

| Category         | Sub-category                       | Overall C&I (%) | Commercial Waste (%) | Industrial Waste (%) | 20.03.01 Waste (%) | 19.12.12 Waste (%) |
|------------------|------------------------------------|-----------------|----------------------|----------------------|--------------------|--------------------|
| Plastics         | Dense plastic non-packaging        | 3.4%            | 3.2%                 | 3.1%                 | 3.0%               | 4.8%               |
| Plastics         | Packaging film                     | 9.0%            | 6.8%                 | 23.1%                | 9.5%               | 6.9%               |
| Plastics         | Refuse and single use carrier bags | 2.6%            | 2.7%                 | 2.4%                 | 2.6%               | 2.5%               |
| Plastics         | Bags for Life                      | 0.1%            | 0.1%                 | 0.0%                 | 0.1%               | 0.2%               |
| Plastics         | Other non-packaging film           | 1.2%            | 0.3%                 | 0.4%                 | 1.2%               | 1.2%               |
| Metals           | Ferrous food and beverage cans     | 0.6%            | 0.7%                 | 0.3%                 | 0.6%               | 0.5%               |
| Metals           | Non-ferrous food and beverage cans | 0.5%            | 0.6%                 | 0.1%                 | 0.6%               | 0.3%               |
| Metals           | Other ferrous packaging            | 0.2%            | 0.2%                 | 0.1%                 | 0.2%               | 0.2%               |
| Metals           | Other non-ferrous packaging        | 0.3%            | 0.3%                 | 0.5%                 | 0.3%               | 0.4%               |
| Metals           | Ferrous non-packaging              | 1.4%            | 1.3%                 | 0.5%                 | 1.2%               | 2.4%               |
| Metals           | Non-ferrous non-packaging          | 0.5%            | 0.8%                 | 0.1%                 | 0.6%               | 0.2%               |
| Organic          | Food waste - edible food           | 11.4%           | 12.4%                | 23.2%                | 12.5%              | 6.7%               |
| Organic          | Food waste - inedible parts        | 3.6%            | 4.9%                 | 0.6%                 | 3.9%               | 2.4%               |
| Organic          | Garden waste                       | 1.6%            | 1.7%                 | 1.8%                 | 1.6%               | 1.3%               |
| Organic          | Other biodegradable                | 1.3%            | 1.1%                 | 0.4%                 | 1.1%               | 2.2%               |
| Glass            | Glass bottles and jars             | 1.6%            | 1.9%                 | 0.2%                 | 1.7%               | 1.1%               |
| Glass            | Non-packaging glass                | 0.2%            | 0.2%                 | 0.0%                 | 0.2%               | 0.3%               |
| Textiles & shoes | Clothing textiles                  | 1.0%            | 0.7%                 | 0.3%                 | 0.6%               | 2.4%               |
| Textiles & shoes | Non-clothing textiles              | 2.0%            | 2.1%                 | 0.8%                 | 1.7%               | 3.0%               |
| Textiles & shoes | Shoes                              | 0.3%            | 0.3%                 | 0.2%                 | 0.3%               | 0.5%               |
| Other WEEE       | White goods                        | 0.0%            | 0.0%                 | 0.0%                 | 0.0%               | 0.0%               |
| Other WEEE       | TVs and monitors                   | 0.0%            | 0.0%                 | 0.0%                 | 0.0%               | 0.1%               |



| Category   | Sub-category                | Overall C&I (%) | Commercial Waste (%) | Industrial Waste (%) | 20.03.01 Waste (%) | 19.12.12 Waste (%) |
|------------|-----------------------------|-----------------|----------------------|----------------------|--------------------|--------------------|
| Other WEEE | Large electronic goods      | 0.0%            | 0.0%                 | 0.0%                 | 0.0%               | 0.1%               |
| Other WEEE | Other WEEE                  | 0.9%            | 0.9%                 | 0.4%                 | 0.8%               | 1.2%               |
| Hazardous  | Oil                         | 0.0%            | 0.1%                 | 0.0%                 | 0.1%               | 0.0%               |
| Hazardous  | Clinical waste              | 0.2%            | 0.3%                 | 0.0%                 | 0.2%               | 0.1%               |
| Hazardous  | Lead acid batteries         | 0.0%            | 0.0%                 | 0.0%                 | 0.0%               | 0.0%               |
| Hazardous  | Other potentially hazardous | 0.4%            | 0.6%                 | 0.0%                 | 0.4%               | 0.2%               |
| Hazardous  | Paint                       | 0.0%            | 0.0%                 | 0.0%                 | 0.0%               | 0.1%               |
| Misc.      | Non-hazardous paint         | 0.1%            | 0.0%                 | 0.0%                 | 0.0%               | 0.3%               |
| Misc.      | Wood packaging              | 1.2%            | 1.2%                 | 2.0%                 | 1.4%               | 0.4%               |
| Misc.      | Wood non packaging          | 3.9%            | 3.8%                 | 0.6%                 | 3.4%               | 6.3%               |
| Misc.      | C & D waste                 | 4.1%            | 3.4%                 | 5.6%                 | 3.3%               | 7.8%               |
| Misc.      | Carpet and underlay         | 2.0%            | 2.2%                 | 0.4%                 | 1.8%               | 3.3%               |
| Misc.      | Mattresses                  | 0.1%            | 0.0%                 | 0.0%                 | 0.0%               | 0.5%               |
| Misc.      | Furniture                   | 1.6%            | 1.8%                 | 0.0%                 | 1.5%               | 2.1%               |
| Misc.      | Disposable nappies and AHP  | 0.6%            | 0.6%                 | 0.0%                 | 0.5%               | 1.1%               |
| Misc.      | Misc. combustible           | 5.6%            | 5.8%                 | 8.7%                 | 5.7%               | 5.3%               |
| Misc.      | Misc. non-combustible       | 0.8%            | 0.9%                 | 0.5%                 | 0.9%               | 0.8%               |
| Misc.      | Biodegradable sludges       | 0.0%            | 0.0%                 | 0.0%                 | 0.0%               | 0.0%               |
| Misc.      | Non-biodegradable sludges   | 0.0%            | 0.0%                 | 0.0%                 | 0.0%               | 0.0%               |
| Fines      | Fines <10mm                 | 3.2%            | 3.0%                 | 1.5%                 | 2.8%               | 5.2%               |
|            | <b>Total</b>                | <b>100.0%</b>   | <b>100.0%</b>        | <b>100.0%</b>        | <b>100.0%</b>      | <b>100.0%</b>      |

## Appendix 4 – Recyclability

Materials counted as recyclable when calculating recyclability of the waste.

| Main category      | Sub-category                        | Recyclable or compostable? |
|--------------------|-------------------------------------|----------------------------|
| Paper and board    | Newspaper and magazines             | Yes                        |
| Paper and board    | Recyclable paper packaging          | Yes                        |
| Paper and board    | Other recyclable paper              | Yes                        |
| Paper and board    | Cardboard                           | Yes                        |
| Paper and board    | Flat card                           | Yes                        |
| Paper and board    | Waxed (coffee cups/takeaway)        | No                         |
| Paper and board    | Drink cartons                       | Yes                        |
| Paper and board    | Kitchen roll and tissues            | No                         |
| Paper and board    | Other non-recyclable paper and card | No                         |
| Plastics           | PET bottles                         | Yes                        |
| Plastics           | HDPE bottles                        | Yes                        |
| Plastics           | PP bottles                          | Yes                        |
| Plastics           | Other bottles                       | Yes                        |
| Plastics           | Pots, tubs and trays                | Yes                        |
| Plastics           | Wet wipes/cloths/sponges            | No                         |
| Plastics           | Expanded polystyrene                | No                         |
| Plastics           | Black plastic                       | No                         |
| Plastics           | Other dense plastic packaging       | Yes                        |
| Plastics           | Dense plastic non-packaging         | Yes                        |
| Plastics           | Packaging film                      | Yes                        |
| Plastics           | Refuse and single use carrier bags  | Yes                        |
| Plastics           | Bags for Life                       | Yes                        |
| Plastics           | Other non-packaging film            | Yes                        |
| Metals             | Ferrous food and beverage cans      | Yes                        |
| Metals             | Non-ferrous food and beverage cans  | Yes                        |
| Metals             | Other ferrous packaging             | Yes                        |
| Metals             | Other non-ferrous packaging         | Yes                        |
| Metals             | Ferrous non-packaging               | Yes                        |
| Metals             | Non-ferrous non-packaging           | Yes                        |
| Organic            | Food waste - edible food            | Yes                        |
| Organic            | Food waste - inedible parts         | Yes                        |
| Organic            | Garden waste                        | Yes                        |
| Organic            | Other biodegradable                 | No                         |
| Glass              | Glass bottles and jars              | Yes                        |
| Glass              | Non-packaging glass                 | No                         |
| Textiles and shoes | Clothing textiles                   | Yes                        |
| Textiles and shoes | Non-clothing textiles               | No                         |
| Textiles and shoes | Shoes                               | No                         |

| Main category | Sub-category                | Recyclable or compostable? |
|---------------|-----------------------------|----------------------------|
| Other WEEE    | White goods                 | Yes                        |
| Other WEEE    | TVs and monitors            | Yes                        |
| Other WEEE    | Large electronic goods      | Yes                        |
| Other WEEE    | Other WEEE                  | Yes                        |
| Hazardous     | Oil                         | No                         |
| Hazardous     | Clinical waste              | No                         |
| Hazardous     | Lead acid batteries         | No                         |
| Hazardous     | Other potentially hazardous | No                         |
| Hazardous     | Paint                       | No                         |
| Misc.         | Non-hazardous paint         | No                         |
| Misc.         | Wood packaging              | Yes                        |
| Misc.         | Wood non packaging          | Yes                        |
| Misc.         | C&D type waste              | Yes                        |
| Misc.         | Carpet and underlay         | Yes                        |
| Misc.         | Mattresses                  | Yes                        |
| Misc.         | Furniture                   | Yes                        |
| Misc.         | Disposable nappies and AHP  | No                         |
| Misc.         | Misc. combustible           | No                         |
| Misc.         | Misc. non-combustible       | No                         |
| Misc.         | Biodegradable sludges       | No                         |
| Misc.         | Non-biodegradable sludges   | No                         |
| Fines         | Fines <10mm                 | No                         |

## Appendix 5 – Biodegradability

This table lists the materials counted as biodegradable when calculating the biodegradability of the waste. This classification is based on Environment Agency (2006) *Guidance on the landfill allowance schemes: municipal waste*

| Sub-category                        | Biodegradability |
|-------------------------------------|------------------|
| Newspaper and magazines             | 100%             |
| Recyclable paper packaging          | 100%             |
| Other recyclable paper              | 100%             |
| Cardboard                           | 100%             |
| Flat card                           | 100%             |
| Waxed (coffee cups/takeaway)        | 100%             |
| Drink cartons                       | 100%             |
| Kitchen roll and tissues            | 100%             |
| Other non-recyclable paper and card | 100%             |
| PET bottles                         | 0%               |
| HDPE bottles                        | 0%               |
| PP bottles                          | 0%               |
| Other bottles                       | 0%               |
| Pots, tubs and trays                | 0%               |
| Wet wipes/cloths/sponges            | 0%               |
| Expanded polystyrene                | 0%               |
| Black plastic                       | 0%               |
| Other dense plastic packaging       | 0%               |
| Dense plastic non-packaging         | 0%               |
| Packaging film                      | 0%               |
| Refuse and single use carrier bags  | 0%               |
| Bags for Life                       | 0%               |
| Other non-packaging film            | 0%               |
| Ferrous food and beverage cans      | 0%               |
| Non-ferrous food and beverage cans  | 0%               |
| Other ferrous packaging             | 0%               |
| Other non-ferrous packaging         | 0%               |
| Ferrous non-packaging               | 0%               |
| Non-ferrous non-packaging           | 0%               |
| Food waste - edible food            | 100%             |
| Food waste - inedible parts         | 100%             |
| Garden waste                        | 100%             |
| Other biodegradable                 | 100%             |
| Glass bottles and jars              | 0%               |

| <b>Sub-category</b>         | <b>Biodegradability</b> |
|-----------------------------|-------------------------|
| Non-packaging glass         | 0%                      |
| Clothing textiles           | 50%                     |
| Non-clothing textiles       | 50%                     |
| Shoes                       | 50%                     |
| White goods                 | 0%                      |
| TVs and monitors            | 0%                      |
| Large electronic goods      | 0%                      |
| Other WEEE                  | 0%                      |
| Oil                         | 0%                      |
| Clinical waste              | 0%                      |
| Lead acid batteries         | 0%                      |
| Other potentially hazardous | 0%                      |
| Paint                       | 0%                      |
| Non-hazardous paint         | 0%                      |
| Wood packaging              | 100%                    |
| Wood non packaging          | 100%                    |
| C&D type waste              | 0%                      |
| Carpet and underlay         | 50%                     |
| Mattresses                  | 50%                     |
| Furniture                   | 50%                     |
| Disposable nappies and AHP  | 50%                     |
| Misc. combustible           | 50%                     |
| Misc. non-combustible       | 0%                      |
| Biodegradable sludges       | 100%                    |
| Non-biodegradable sludges   | 0%                      |
| Fines <10mm                 | 50%                     |

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