2013 Waste Data Quality Report

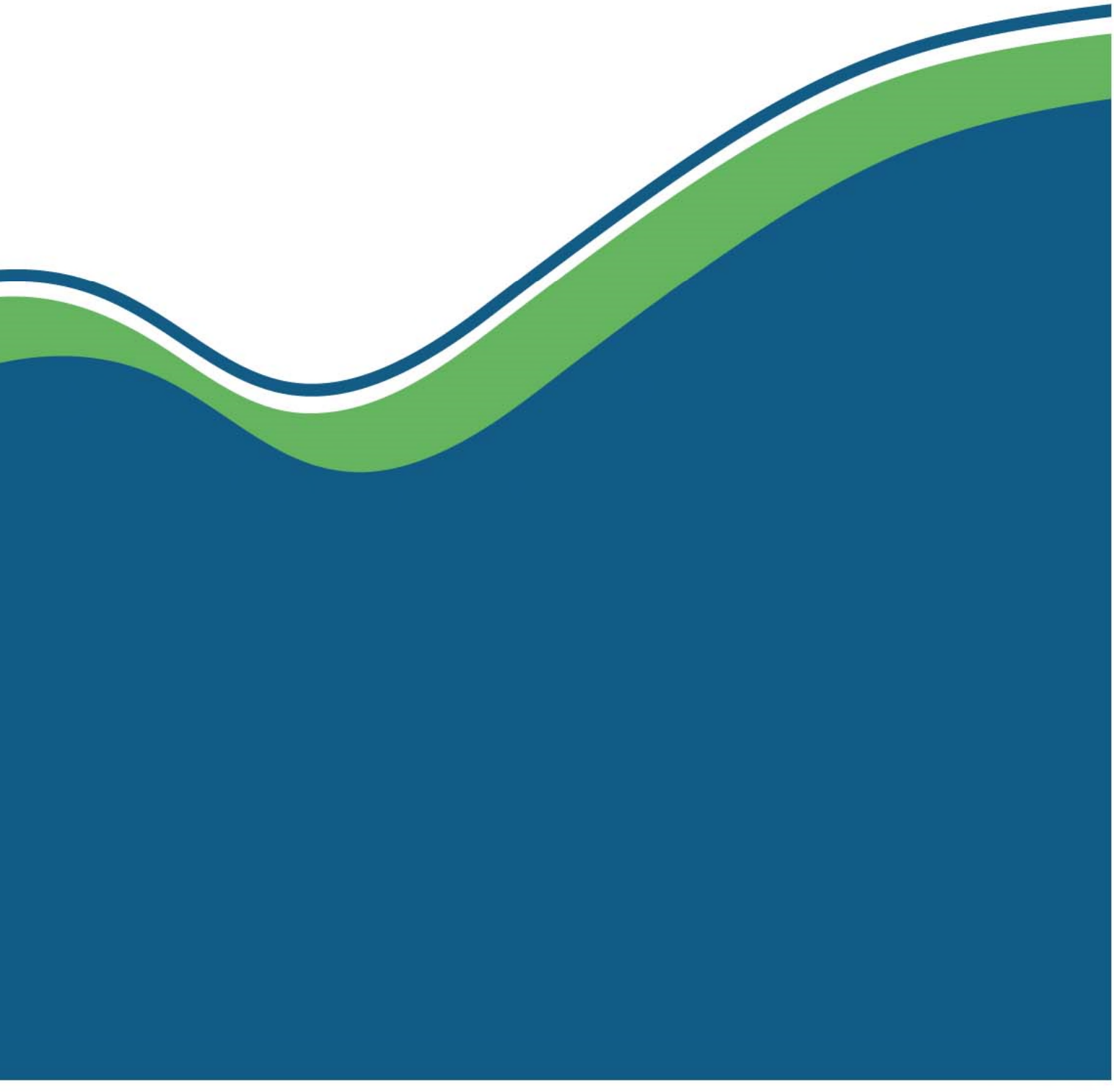


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1 Introduction

This report describes the methodologies to produce summary waste data for Scotland for the 2013 calendar year. The report should be used alongside the 2013 waste data tables, which are published as two distinct datasets: the first dataset covers waste from household sources only, the second dataset covers waste from all sources (WFAS) which is the total waste managed, whether it be waste from households, waste from construction and demolition, or waste from commerce and industry.

The 2013 data are presented as follows:

- Scotland's Environment Waste Discover Data tool presents the WFAS in an interactive and visual format and is found on Scotland's Environment web at http://www.environment.scotland.gov.uk/get-interactive/data/waste-from-all-sources/

- Scotland's Environment Household Waste Discover Data tool presents the waste from household sources in an interactive and visual format and is found on Scotland's Environment web at http://www.environment.scotland.gov.uk/get-interactive/data/household-waste/

- Both the waste from household sources and the WFAS data tables may be downloaded in Excel format from SEPA's website at http://www.sepa.org.uk/environment/waste/waste-data/waste-data-reporting/waste-data-for-scotland/

The waste from all sources data tables that accompany this report are structured according to the waste management options set out in the Scottish Government's Guidance on applying the waste hierarchy[1]:

- Prevention
- Prepare for reuse
- Recycle
- Recover other value
- Disposal.

This document is structured in the same way as the data tables, except for household waste, which is presented in a stand-alone section. This is because household data is taken from a discrete dataset (WasteDataFlow[2]) and it is more concise to report the methodology in a single section.

In some cases the quantities of household waste and waste from all sources are counterintuitive. For example, there is more household waste than waste from all sources for a given reporting category. This is a product of using different datasets and corresponding methodologies which are not comparable.

For the WFAS data tables, no attempt has been made to reconcile the tonnages of waste generated and waste managed. Several data sources used for varying purposes have been used to generate the data used in this tool. There will be double

[1] www.scotland.gov.uk/Resource/0042/00420711.pdf

[2] http://www.sepa.org.uk/environment/waste/waste-data/guidance-and-forms-for-operators/local-authorities/

counting of some data: for example, incinerator tonnages are gross input tonnages to incinerators. No attempts have been made to exclude from the landfill tonnages any incinerator outputs of ash sent to landfill.

It should be noted that this approach differs from the household data tables, in which waste generated and waste managed is balanced, with the exception of waste sent to interim storage. Using the incineration example: in the household tool, 'incineration' reports net inputs to incinerators to avoid double counting of incinerator outputs.

The WFAS generated is approximately 15% greater than that managed. Part of this difference may be due to some waste not captured using the existing methodology. For example, waste that is exported to another part of the UK for landfill or incineration, and is sent to an interim storage site outside Scotland before it is sent for disposal, will not be captured in the existing methodology. However, these are believe to be relatively minor tonnages and the reason for the majority of this discrepancy is currently unknown. SEPA is undergoing a review of it's waste reporting in 2015 with the objective of identifying any potential gaps in the reporting methodologies and datasets.

The five data sources referred to at various parts of the document are listed below. The agency that carries out the analysis of the dataset is provided in brackets.

- Scottish licensed/permitted site returns (SEPA)
- Household wastes managed by Scottish local authorities (SEPA)
- Wastes managed by exempt activities in Scotland (SEPA)
- Scottish accredited packaging waste re-processors (SEPA)
- UK packaging waste generated (Defra)
- Zero Waste Scotland Aggregates Quality Protocol Supplier Directory (ZWS)

Appendix 1 provides a fuller description for four of the datasets listed above, including any links to return forms and guidance.

Appendix 2 lists three separate conversions of data that were used in the Commercial and Industrial (C&I) generated methodology (also see Section 3.2).

Appendix 3 and Appendix 4 list the waste categories used in the household waste methodology (also see Section 9).

Appendix 5 provides a brief summary of the coding of waste using European Waste Catalogue (EWC) and European Waste Catalogue for Statistics (EWC-STAT), which are used throughout this document.

Appendix 6 provides a glossary of terms.

Appendix 7 provides a list of acronyms.

1.1 Historical Data

Where there have been any changes in methodology for the waste data tables, the complete dataset has been revised for all years to ensure that comparisons between years are valid. For 2013 there has not been any significant changes to methodology than that used for the 2012 dataset. However there has been some revisions of 2011 and 2012 data as follows:

- The commercial and industrial (C&I) datasets have been revised for 2011 and 2012. SEPA has developed a semi-automated tool to produce the C&I data

using the existing methodology. The 2013 dataset was produced using this tool and the 2011 and 2012 data were revised to ensure consistency in production.

- The 2012 organic recycling data have been revised to address an erratum contained within the 2012 publication

2 Progress against Zero Waste Plan Targets

2.1 Introduction

The Scottish Government's first Zero Waste Plan (ZWP), published on the 9th June 2010, sets out the Scottish Government's vision for a zero waste society. This vision describes a Scotland where **all** waste is seen as a resource, where waste is minimised, where valuable resources are not disposed of in landfills, and where most waste is sorted, leaving only limited amounts to be treated.

The ZWP sets a number of objective and measurable targets for tracking progress against the objectives specified in the plan. A summary of these targets is specified in Section 13 of Annex A of the plan, and is summarised in Table 1 below.

Table 1 Zero Waste Plan Targets

Target/Cap	Year	Derivation
40% recycling/composting and preparing for re-use of household waste	2010	Scottish Government target
No more than 2.7 million tonnes of biodegradable municipal waste to be sent to landfill	2010	Article 5(2) of the EU Landfill Directive
50% recycling/composting and preparing for re-use of household waste	2013	Scottish Government target
The preparing for re-use and the recycling of 50% by weight of waste materials such as paper, metal, plastic and glass from household waste and similar	2020	Article 10(2)a of the EU Waste Framework Directive
No more than 1.8 million tonnes of biodegradable municipal waste to be sent to landfill	2013	Article 5(2) of the EU Landfill Directive
60% recycling/composting and preparing for re-use of household waste	2020	Scottish Government target
No more than 1.26 million tonnes of biodegradable municipal waste to be sent to landfill	2020	Article 5(2) of the EU Landfill Directive
70% recycling and preparing for re-use of construction and demolition waste	2020	Article 11(2)(b) of the revised EU Waste Framework Directive
No more than 5% of all waste to go to landfill	2025	Scottish Government target
70% recycling/composting and preparing for re-use of all waste by 2025	2025	Scottish Government target

2.2 Recycling/composting and preparing for re-use of household waste

The method used to prepare the household waste recycling/composting and preparing for re-use figure is based on household waste collected and managed in WasteDataFlow (see section 9 Household waste). The total waste reused, composted and recycled for all 32 Scottish local authorities is calculated as follows:

$$\text{Percentage waste from households recycled} = \frac{\text{Waste from households recycled}}{\text{Waste from households generated}} * 100$$

The meaning of household waste changed in 2011 with the introduction of the Zero Waste Plan. The household recycling figures use the revised meaning for 2011 – 2013[3]. The household waste recycling figures for 2004 – 2010 are based on the old definition of household waste. Changes in the definition of household waste include:

- compost like output from mechanical and biological treatment (MBT) of household wastes previously counted as recycled was re-classified as 'Other recovery';
- metals and ash from incineration previously counted as recycled was re-classified as 'Other recovery';
- street-sweeping, gully waste, healthcare waste, and beach-cleansing waste were re-classified from household to commercial waste.

2.3 The preparing for re-use and the recycling by weight of waste materials such as paper, metal, plastic and glass from household waste and similar

This is a European target that has been incorporated into the ZWP.

Article 11(2)(a) of the Waste Framework Directive (Directive 2008/98/EC) specifies that member states must meet a recycling target of 50% by weight for the recycling of waste materials such as paper, metal, plastic and glass from households. The figures in the waste data tables that track progress against this ZWP target are based on the Scotland dataset provided to Defra for this purpose. This metric is calculated as follows:

Waste from households generated (EU) (tonnes)	=	Waste from households generated (tonnes)	*minus*	waste soils and waste construction and demolition waste from households recycled

[3] The above changes were introduced for reporting in the April-June 2011 quarter onwards. The January-March 2011 data for all 32 local authorities was re-analysed to be consistent with the other three quarters for the year.

Percentage waste from households recycled (EU)	=	Household Waste Recycled *minus* Waste Soils and waste C&D from households Recycled / Household Waste Generated (EU)	* 100	

2.4 Recycling and preparing for re-use of construction and demolition waste

A European target that has been incorporated into the ZWP, the recycling rate for construction and demolition (C&D) waste covers the materials listed in Table 2 below:

Table 2. Materials considered in the construction and demolition waste recycling rate

Material
Glass wastes
Metallic wastes, ferrous
Metallic wastes, mixed ferrous and non-ferrous
Metallic wastes, non-ferrous
Mineral waste from construction and demolition
Plastic wastes

The C&D recycling rate is formulated as follows:

C&D and C&I waste recycled	=	Total waste recycled *minus* Household waste recycled		

C&D waste recycled (tonnes)	=	C&D and C&I waste recycled (tonnes)	*	C&D waste generated (tonnes) / C&D + C&I waste generated (tonnes)

C&D waste recycled (percentage)	=	C&D waste recycled (tonnes) / C&D waste generated(tonnes)	* 100

2.5 Biodegradable municipal waste to be sent to landfill

Biodegradable Municipal Waste (BMW) is the fraction of municipal waste that will degrade within a landfill, giving rise to landfill gas emissions, primarily methane. It includes, amongst other materials, food waste, green waste, paper and cardboard.

The BMW of waste sent to landfill is calculated based on the EWC code of the waste. A percentage biodegradability has been determined for all waste sent to landfill, ranging from 100% for materials such as paper and food, 50% for materials such as textiles and furniture, and 0% for inert materials like tyres and metals.

For all waste landfilled the percentage biodegradability factor was applied to the tonnes of waste for each EWC code. This gives the total biodegradable waste landfilled by waste type. This was then split down further to provide data on municipal and non-municipal biodegradable waste. Municipal waste was identified as all waste coded under EWC Chapter 20, selected codes under Chapter 15, and Chapter 19 where the source prior to treatment is deemed to be municipal. Conversely, non-municipal waste is determined to be the waste not coded according to these criteria.

2.6 Percentage of waste from all sources landfilled

As indicate in section 1, the WFAS waste generated is approximately 15% greater than that managed. This discrepancy complicates the calculation of percentage of wise landfilled. The methodology therefore takes the waste landfilled as a proportion of total waste managed; that is reused, recycled, composted, incinerated and landfilled.

Total waste managed (tonnes)	=	Total waste reused *plus* waste recycled *plus* waste composted *plus* waste incinerated *plus* waste landfilled (tonnes)

Percentage waste landfilled	=	$\frac{\text{Waste landfilled (tonnes)}}{\text{Total waste managed (tonnes)}}$	* 100

2.7 Percentage of waste from all sources recycled

To determine the WFAS recycling rate, an approach similar to that used to derive the percentage of WFAS landfilled was used. The methodology takes the waste recycled as a proportion of all waste managed; reused, recycled, composted, incinerated and landfilled.

Total waste managed (tonnes)	=	Total waste reused *plus* waste recycled *plus* waste composted *plus* waste incinerated *plus* waste landfilled (tonnes)

Percentage recycled	=	$\frac{\text{Waste recycled (tonnes)}}{\text{Total waste managed (tonnes)}}$	* 100

3 Prevention

3.1 Introduction

Waste prevention is a term that relates to waste materials and is defined in European Law as measures taken before a substance, material or product has become waste that reduce:

- the quantity of waste, including through the re-use of products or the extension of the lifespan of products;
- the adverse impacts of the generated waste on the environment or human health;
- the content of harmful substances in materials and products.

For the purposes of reporting, we use both total waste generated and waste generated per unit of Gross Value Added (GVA) as indicators of waste prevention. Further details for the GVA method are provided in Section 3.6. The methodologies detailed in the following section do not focus on how and where the waste is generated.

The following section is split into five distinct methods:

- Commercial and industrial waste generated
- Construction and demolition waste generated
- Special waste generated
- Packaging waste generated
- Waste generated per unit of gross value added

The methodology for household waste generated is detailed in Section 9.2.4.

3.2 Commercial and industrial waste generated

3.2.1 Introduction

Commercial and industrial (C&I) waste referred to in this section relates to waste produced by businesses and excludes Construction and Demolition (C&D) waste.

The method used to estimate Scottish C&I waste generated for 2013 is based on the use of SEPA regulatory data. It uses data from licensed/permitted site returns and complex exempt activities to provide estimates of waste generated by business sector.

This is the same method used in 2011 and 2012 but, prior to this, data on the wastes produced by businesses was collected by SEPA using business waste surveys.

Overview

In order to produce estimates of C&I waste generated, an analysis was carried out of all waste inputs to licensed/permitted and complex exempt sites in Scotland. The sector producing the waste, as defined by Standard Industry Classification[4] (SIC)

[4] www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/standard-industrial-classification/index.html

codes, was determined using different approaches depending on the size of the operator, or the type of site.

Once sectors had been assigned to all waste inputs then waste arising from specific sectors was excluded to produce the final dataset. The sectors excluded were construction, waste management and households.

3.2.2 Methodology

Inputs to waste management sites from licensed/permitted site returns (Table B – Waste inputs to site) were used as the primary source of data for this study, together with returns from complex exempt activities. The principle was to count waste when it first entered the waste management system, at which point the producer can be determined.

All operational sites in 2013 were considered relevant to this study and comprised 754 waste management sites and 427 complex exempt activities. The total waste input to these sites was 19.2 million tonnes of which 15.9 million tonnes was form licence site returns. All data excludes waste that data returns indicate are non-Scottish in origin.

Three approaches were used to obtain information on the producer of waste, based on the following groups:

- large waste operators that handled more than 50,000 tonnes of waste in total;
- small waste operators that handled less than 50,000 tonnes of waste in total and complex exempt activities;
- local authorities;

The approach taken for each of these groups is explained in more detail below.

Large waste operators

Operators that handled more than 50,000 tonnes of waste in total in 2013 were identified from their licensed/permitted site returns by adding together the inputs to all of their sites (63 operators). These operators excluded those that did not need to be contacted because the origin of waste was clear or were local authority sites.

Operators were sent a document which summarised their licensed/permitted site returns data and were asked to indicate the origin of waste by broad SIC group for each EWC code. A return rate of 71% which amounted to 80% of the surveyed tonnages was received to this request in 2013.

For operators that did not respond to the SIC data request the approach used for small operators was followed.

Small waste operators and Complex exemptions

For those in the second group, where the origin of the waste was clear, we assigned SIC codes based on either:

- type of operator (see Table 15 of Appendix 2);
- type of waste using the standard assumptions (see Table 17 of Appendix 2).

The origin of waste (SIC group) for returns from operators that handled less than 50,000 tonnes of waste was estimated using the standard assumptions in Appendix

2. These estimates were based on the EWC code (where it indicated the waste came from a specific sector, e.g. waste from the food industry) or information from SEPA's business waste data 2010.

Local authorities

Individual authorities were not contacted during the study as detailed information on sites handling local authority collected waste was readily available from WasteDataFlow.

For sites operated by a local authority, the overall percentage split of household/commercial waste for each authority reported in WasteDataFlow was used to assign waste inputs to either the household or commerce SIC group depending on the type of waste allowed by the site licence. If a site was only licensed to accept household waste then all of the waste was assigned to the household SIC group. If the site was licensed to accept both household and commercial waste then waste was assigned to the household and commerce SIC groups in accordance with the split.

Waste handled by local authority sites accounted for 15.7% of the licence site return data in 2013.

Inclusions and exclusions in the dataset

Once the main analysis was complete and SIC codes assigned to all 19.2 million tonnes of waste, the inclusion, exclusion or recalculation of specific wastes was necessary in order to produce the final dataset. The actions carried out are explained below.

Wastes produced by the waste management industry

There are two issues associated with waste produced by the waste management industry.

First, in order to avoid double-counting of waste, inputs to any site that arrived from another waste management site (mostly waste coded under EWC Chapter 19) were assumed to have been counted earlier in the chain and were removed from the dataset.

Second, it is difficult to identify waste produced by the waste management sector itself (e.g. from the company's offices or workshops) because these wastes are often combined with wastes from the commercial side of their business and are not measured separately. For this study a small amount of waste was estimated using Table 17 of Appendix 2. It is acknowledged that this estimate is in need of improvement as it does not include all wastes that could potentially be produced by the industry.

Wastes produced by households

Waste identified as arising from households was excluded from the final dataset.

Wastes from the construction sector

Waste identified as arising from the construction industry (coded under European Waste Catalogue Chapter 17) was excluded from the final dataset, unless specifically

indicated in the survey that it is not from the Construction sector. In 2013 there was 52,964 tonnes of chapter 17 wastes in the final dataset that surveys indicate were not from the Construction sector.

Wet and dry weights

Under the European Waste Statistics Regulation, the majority of data is required to be reported as wet weight, except for common sludges, industrial effluent sludges and dredging spoils. To provide consistency with European reporting these wastes were converted to dry weights in the final dataset by the use of standard UK conversion factors. These factors are set out in Appendix 2.

Addition of missing data

For data that is under-reported because it does not (legitimately) pass through a licensed/permitted or complex exempt site in Scotland, the missing data was estimated and added to the final dataset, ensuring no waste was double-counted. The method of estimation of missing data is described in Table 3 below.

Table 3. Waste types not captured under the licensed/permitted or complex exempt datasets and the alternative approach used

Sector/waste type	Waste type	Issue	Solution
Agriculture	Chemical wastes	Sheep dip and pesticides may be disposed on farm	Estimated using Agricultural Waste Estimates Model[5]
Agriculture	Plastics	Often handled by simple exempt activities with no data reporting requirement	Estimated using Agricultural Waste Estimates Model[5]
Chemical manufacture	Solvents	May be transported directly to the rest of the UK for processing	Scottish solvents identified using Environment Agency Hazardous Waste Interrogator
Commerce	Tyres	May be transported directly to the rest of the UK for processing or for use overseas	Estimated tyre exports from Zero Waste Scotland market research

It should also be noted that waste produced by a business in Scotland that is exported directly and does not pass through a Scottish waste management site will not be captured in the dataset. The scale of this missing data is not currently known.

[5] Agricultural Waste Estimates Model developed by Marcus Hodges Environment and BDB Associates on the behalf of the Environment Agency

Final dataset

Following assignment of industry sector to all the waste, the waste generated from households, the construction sector and waste handled by the waste management sector were removed from the total. The resulting dataset provided the commercial and industrial waste generated data for 2013 and amounted to 3.7 million tonnes.

Accuracy of SIC codes

Overall, as in indicated in Table 4 below, approximately one third of waste tonnages from site returns were assigned an industry sector via survey, one third via local authority household / commerce splits, and one third through estimations from EWC code.

Table 4. Summary of how industry sector data was produced

Origin of SIC code*	Percentage of total waste analysed	
	Site Returns	Complex Exemptions
Total tonnages	15,869,479	3,264,810
Total tonnages excl. EWC chapter 17 and 19	7,699,251	713,364
Operator survey responses	32%	na
Local authority sites	33%	na
Operator type	1%	0%
EWC code	33%	100%

*Percentages are all relative to total tonnages excluding chapter 17and 19 waste

3.3 Construction and demolition waste generated

3.3.1 Summary

The total quantity of C&D waste generated in Scotland in 2013 was 6.2 million tonnes. The equivalent figure for 2012 was 4.7 million tonnes, representing a increase of 1.5 million tonnes between 2012 and 2013.

3.3.2 Introduction

This section describes the methodology for reporting the quantities of Construction and Demolition (C&D) waste generated in Scotland in 2013. It captures all waste types recorded in the data returns as European Waste Catalogue (EWC) Chapter 17 (C&D wastes including excavated soil from contaminated sites), such as soil, stones, wood and metals.

The methodology for 2013 uses data from three sources: licensed/permitted site returns and complex exempt activity returns, both of which are managed by SEPA, and the Zero Waste Scotland Aggregates Quality Protocol Supplier Directory, managed by ZWS.

In 2013, neither of the two C&D data sources managed by SEPA contained estimated data for non-submitted returns.

The aggregates data supplied by ZWS was introduced for the first time in 2012 and was retrospectively applied to the 2011 dataset to ensure consistency of methodology between years. It does contain some estimated data as explained in Appendix 1.

3.3.3 Methodology

Licensed/permitted sites dataset

Data returns from 259 licensed/permitted sites operating in 2013 were used to calculate C&D waste generated. To avoid double-counting, 10 sites were excluded as it was thought their waste they might already be included in the aggregates dataset provided by ZWS. Thus, 249 sites were used overall.

Waste with an origin outside Scotland was removed from the dataset (20,376 tonnes).

As a consignment of waste may be managed at more than one licensed/permitted site, we use the following calculation to avoid double-counting and produce our best estimate of C&D waste generated:

Chapter 17 waste inputs *minus* Chapter 17 waste outputs	=	Chapter 17 waste generated

This is calculated at the Scotland level, not at the site level. The difference in inputs minus outputs is estimated as waste generated. This can be waste that has been:

- treated so that it changes from waste to a final (non-waste) product;
- treated onsite and recoded to a non-Chapter 17 waste type;
- stored onsite for the reporting period before being moved offsite.

Metal recycling

The exception to the above calculation is metal waste which has a high economic value and ends up at a small number of recycling sites before being exported from Scotland for recycling. To estimate the amount of metal waste generated, we use the quantity of EWC Chapter 17 waste metals exported from selected recycling sites.

Plastic wastes

In 2013, slightly more plastic wastes left sites than entered them. The amount of plastic waste generated was taken to be the higher reported figure of wastes leaving sites.

Recoding of wastes to Chapter 19

Some of the EWC Chapter 17 codes may be recoded to EWC Chapter 19 (wastes from waste management facilities etc.) as a result of onsite treatment, e.g. physical sorting/shredding. For example, a mixed skip of C&D waste (17 09 04) may be sorted onsite and reported as separated fractions of ferrous metal (19 12 12), non-ferrous metal (19 12 03), glass (19 12 05) and other wastes (19 12 12). This is not an issue for the calculation of waste generation as the input minus outputs approach

described above captures the tonnages of EWC Chapter 17 wastes at the input stage.

Waste storage

Sites with Chapter 17 outputs but no inputs (e.g. those storing waste from a previous reporting period) were removed from the analysis, as their waste will be captured in the previous year.

Complex exemption dataset

Further details of the methodology for the exemptions dataset can be found in Section 4.5. This section provides more specific details on the use of the exemptions dataset for reporting C&D waste generated.

Exempt activities are commonly used where waste is recycled into new products or reused. The tonnages of waste reported in the exempt activity data returns will be a direct estimate of waste generated. In some cases, waste may travel to exempt sites via a licensed/permitted site, but the input minus outputs approach used with the licensed/permitted site dataset minimises the risk of double counting.

Data returns from complex exempt activities registered in Scotland between 1 July 2012 and 30 June 2013 were used to report on C&D waste (EWC Chapter 17) generated. These exempt activities were registered under Paragraphs 7, 9, 19, and 45, and together they accounted for 35% of the 615 exempt activities that submitted non-nil returns and 63% of the overall tonnage handled by exempt activities in Scotland.

No estimated data were included in the 2013 exemptions dataset. All tonnages are self-reported by sites using the exemptions return form. Further details are given in Section 4.5. In 2013, the amount of C&D waste managed by exempt activities was 2.1 million tonnes, which is significantly higher than the 0.88 million tonnes reported in 2012. The increase is almost exclusively due to waste soils with 1.9 million tonnes of soils entering exempt sites in 2013. The generation of construction and demolition is more variable than the generation of household and C&I waste, dependant on current construction projects and economic activity. Approximately 0.4 million tonnes of these soils were generated from a gas line project in Shetland and used for peat land restoration. An additional 1.4 million tonnes entered 63 separate exempt sites each of which accepted greater than 10 thousand tonnes of soil during the 2013 reporting period.

Table 5. Reported tonnages of C&D waste from the 2012 and 2013 exemptions datasets, by paragraph, and excluding estimated tonnages

	Tonnes		
Paragraph	2012	2013	Difference
7	3,878	4,950	28%
9	134,934	413,475	206%
19	721,096	1,702,835	136%
45	15,176	19,710	30%
Total	**875,084**	**2,140,971**	145%

Aggregates dataset

The quantity of waste aggregates generated in Scotland is based on data from the Aggregates Quality Protocol Supplier Directory provided by Zero Waste Scotland (ZWS). As aggregates data was not able to be obtained for 2013, aggregates data for 2012 was used as a proxy for 2013. Further details of the Aggregates Quality Protocol Supplier Directory and the dataset provided by ZWS can be found in Appendix 1.

3.4 Special waste generated

The 2013 data for special waste generated is not taken from an independent data set. The data originates from the individual analyses for household, commercial and industrial, and construction and demolition wastes generated as described elsewhere. The wastes classified as hazardous in each waste generated methodology are combined to produce an overall figure.

3.5 Packaging waste generated

Estimates of packaging waste generated for the UK are produced by Defra. Scottish packaging waste generated is assumed to represent 10% of the UK waste generated.

3.6 Waste generated per unit of Gross Value Added

According to the Office of National Statistics (ONS), gross value added (GVA) measures the contribution to the economy of each individual producer, industry or sector in the United Kingdom. GVA is published by ONS at the regional (NUTS1) level[6] meaning that data is available specifically for Scotland. An information paper on the quality and methodology for regional GVA data is also available on the ONS website[7].

[6] http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-317145

[7] http://www.ons.gov.uk/ons/guide-method/method-quality/quality/quality-information/economic-statistics/quality-and-methodology-information-for-regional-gross-value-added--gva-.pdf

GVA is one of the measures chosen by the Scottish Government for waste prevention. In Scotland's waste prevention plan 'Safeguarding Scotland's Resources[8]' waste prevention is measured by the following:

- The total amount of waste produced by sectors - household; commerce and industry; and construction and demolition.

- The amount of waste produced by sectors per unit of GVA.

- The carbon impact of waste - the whole-life impacts of waste including the benefits of prevention and recycling.

Total GVA represents the overall size or value of the economy in pounds. Dividing total waste generated by total GVA gives a measure of waste generated per pound of GVA. This has been expressed as waste generated per £million GVA in the data tables.

Further information on the use of GVA in the context of waste produced is available from the Scottish Government.

[8] http://www.scotland.gov.uk/Publications/2013/10/6262

4 Recycled

4.1 Introduction

This section describes how we report on the recycling of Scottish wastes within Scotland and outside Scotland. The methodology is split into the following sections:

- composting of waste at licensed/permitted and exempt sites in Scotland;
- glass, plastic and wood recycled in Scotland;
- batteries, discarded equipment, End of Life Vehicles (ELV), glass, metal, paper and card, plastic, and wood recycled outside Scotland;
- recycling by exempt activities in Scotland
- aggregates recycled in Scotland.

The data is for WFAS. We do not report separate household, commercial and industrial (C&I), and construction and demolition (C&D) waste using this methodology. There are distinct methodologies for household waste recycling, reuse and composting in Section 9.

4.2 Organics recycled in Scotland

This section describes how we report on the recycled of organic waste within Scotland. We do not report on the recycling of organic Scottish wastes outside Scotland. We assume all waste composted at Scottish sites is Scottish in origin. Organic recycling data are taken from two data sources managed by SEPA: licensed/permitted sites returns and complex exemptions. There was 512,513 tonnes of organic waste recycled in Scotland in 2013, site returns made up 502,141 tonnes and exemptions 10,372 tonnes.

4.2.1 Organic recycling at licensed/permitted sites

The 2013 methodology captures composting of waste using windrow composting, in-vessel composting (IVC), and anaerobic digestion (AD) of organic wastes at licensed/permitted sites. Data is taken from Table C (Waste treatment on site) for the following two management methods:

- Composting (CP) of all suitable waste types
- Biological treatment (BT) of all suitable waste types, at specific AD/IVC sites

Composting (CP)

For composting (CP) of all suitable waste types, EWC codes with a management method ‘CP’ (composted on site) were assessed as suitable or unsuitable for composting. A total of 388,968 tonnes was reported, of which 388,025 tonnes was judged suitable and 943 tonnes unsuitable. Unsuitable waste categories were excluded from final figures. The five largest tonnages for each category are given in Table 6 below.

Composting (CP) of 20 03 01 (mixed municipal waste) was reported by four sites (22.3 thousand tonnes). This is a reduction of approximately 1.3 thousand tonnes from 2012, and over one third from the 2011 figure. For 2013 we have included 20 03 01 in the figures for composting, but the coding of this waste will be further scrutinised during the verification of site returns and it is anticipated that the tonnage reported will continue to decline in future years.

Table 6. The five largest waste types from Table C reported with management method 'composting'

EWC code	EWC Description	Tonnes
20 02 01	Municipal wastes - biodegradable waste	243,175
20 01 08	Municipal wastes - biodegradable kitchen and canteen waste	86,558
20 03 01	Mixed municipal waste	22,322
02 07 99	wastes from the production of alcoholic and non-alcoholic beverages	3,660
02 02 03	waste from the preparation and processing of meat, fish and other foods of animal origin	5,839

Biological treatment (BT)

Prior to 2011 the organics recycling methodology only used waste reported as management method 'CP' (composted). In 2011 biological treatment (BT) of 20 01 08 (kitchen and canteen waste, 1,967 tonnes) by specific AD/IVC sites was included in final organics recycling reporting.

For 2013 we included all the wastes reported as biological treatment by the same AD/IVC sites. The use of specific AD/IVC sites will ensure other forms of biological treatment (e.g. types of sewage sludge treatment) are excluded from reporting. A total of 124.3 thousand tonnes was reported for BT. The five largest waste types (by tonnes) deemed suitable are shown in Table 7 below. Wastes from food processing and manufacture and agriculture dominate.

Table 7. The five largest waste types from Table C reported with a management method ‚biological treatment', for specific AD/IVC sites

EWC Code	EWC Description	Tonnes
20 01 08	Kitchen and canteen waste	48,121
02 02 04	Sludges from on-site effluent treatment	17,929
02 01 06	Animal faeces, urine and manure	15,177
19 07 03	Landfill leachate not containing dangerous substances	9,577
02 02 03	Meat, fish and other animal processing waste	7,534

In 2013, the AD/IVC facilities contributed 24.3% of the 0.51 million tonnes of organics recycled from the site returns dataset. This is an increase from the 21.1% recorded in 2012 which is in line with what we know about the growth of AD/IVC facilities and collected feedstock during the reporting period.

4.2.2 Exempt composting activity

Some of the composting activity in Scotland is exempt from licensing and is carried out under exemption. Paragraph 12[9] composting is the only data considered for 2013 and represented 10.4 thousand tonnes of waste. The Paragraph 12 data tends to represent smaller tonnage sites comprising 2.0% of the organics recycled in 2013.

More recently anaerobic digestion of agricultural and distillery wastes may have taken place under Paragraph 51, but this was not in place during 2013.

For a more general description of the exemptions dataset, including Paragraph 12 composting, please see section 4.5.

4.3 Glass, plastic and wood recycled in Scotland

Data is taken predominantly from the 2013 accredited re-processor dataset.

2013 Accredited re-processor dataset

The 2013 accredited re-processor dataset consisted of thirteen re-processors: seven glass, three plastic and three wood. The quantity of UK packaging waste recycled under the scheme increased from 251,666 tonnes in 2012 to 323,073 tonnes in 2013. Further details of the accredited re-processor dataset can be found in Appendix 1.

UK packaging waste recycled by Scottish re-processors (so called 'scheme data') is reported quarterly and audited annually by SEPA. In addition to scheme data, at the time of registration for a forthcoming year re-processors also provide details of any non-packaging waste and non-UK sourced packaging waste recycled (so called 'non-scheme' data). Non-scheme data is not audited by SEPA and quality is therefore uncertain. The contributions of scheme and non-scheme data in 2013 are given below in Table 8 below.

Table 8. The relative contributions of UK packaging waste ('scheme data'); and non-packaging waste and non-UK packaging waste ('non-scheme data') for 2013

Scheme data (tonnes)	Non-scheme data (tonnes)	Total recycled (tonnes)	Non-scheme data (as % of total)
323,073	151,305	474,378	43%

For the 2013 data, waste recycled by Scottish accredited re-processors is reported as 100% Scottish in origin.

[9] For further details on tonnage thresholds and process types covered under complex waste exemptions see http://www.sepa.org.uk/regulations/waste/activities-exempt-from-waste-management-licensing/

4.4 Batteries, discarded equipment, end of life vehicles, glass, metal, paper and card, plastic and wood recycled outside Scotland

Data is taken from the 2013 licensed/permitted site returns dataset. The methodology focuses on eight common waste types – it is not an exhaustive list of every possible waste produced within Scotland which is subsequently recycled elsewhere. For all eight waste types we used Table D (Waste sent off site) tonnages for specific European Waste Catalogue (EWC)/European Waste Catalogue – STAT (EWC-STAT) codes reported as leaving Scotland as separated wastes.

We assume that wastes reported as leaving Scotland as separate fractions will eventually be recycled. Any relevant codes reported as disposed (landfill/incineration) at the next site were excluded from the analysis. For a summary of the EWC/EWC-STAT codes used in each analysis, see Table 9 below. Further details on the EWC/EWC-STAT list of wastes can be found in Appendix 5.

Table 9. Summary of the EWC or EWC-STAT codes used for eight waste types reported as recycled outside Scotland

Waste type	EWC or EWC-STAT codes
Batteries	16 06 01*, 16 06 02*, 16 06 04, 16 06 05, 16 06 06*, 20 01 33* and 20 01 34
Discarded equipment	16 02 09*, 16 02 11*, 16 02 13*, 16 02 14, 16 02 15*, 16 02 16, 20 01 21*, 20 01 23*, 20 01 35* and 20 01 36
End of life vehicles (ELV)	16 01 06 only (whole de-polluted vehicles)
Glass	EWC-STAT 7.1
Metals (excluding whole ELV's)	EWC-STAT 6.1-6.3
Paper and card	EWC-STAT 7.2
Plastic	EWC-STAT 7.4
Wood	EWC-STAT 7.5

* Hazardous wastes

The individual analyses above are heavily skewed to a relatively small number of large sites which send recyclable materials to the rest of the UK or further afield. For example, 56 sites were included in the final analysis for metal wastes, comprising 563489 tonnes. The 9 largest sites contributed 521,188 tonnes, or 93% of the total.

The tonnage of paper and card sent outside Scotland for recycling in 2013 was 7% lower than in 2012, a reduction in paper waste generated reflected in a reduced demand for paper recycling.

The tonnage of plastic sent outside Scotland for recycling in 2013 was 17% less than 2012, a difference of just under 4,000 tonnes.

Plastic waste inputs to these sites have been used to indicate the proportion of plastic waste that is non-Scottish. In 2013 98% of the waste originated in Scotland using this methodology and these tonnages are excluded from the recycling figures..

4.5 Recycling by complex exempt activities in Scotland

Waste management exemptions[10] are split into 'simple' and 'complex' activities. Some simple exempt activities also carry out recycling, but are not required to report to SEPA. This section describes the methodology for reporting recycling by complex exemptions.

In 2013, 1,102 exempt activities were registered under Paragraphs 7, 8(2), 9, 10, 12, 19, 42, 45, 47, 50 and 51 between 1 July 2012 and 30 June 2013. There were no Paragraph 46 exemptions registered during this period.

Missing returns (i.e. those registered who had not reported) were chased throughout the reporting period and were prioritised according to tonnage that the applicant forecast they will recycled on the application form. In 2013, SEPA received data returns from 63% of the total number of returns expected. Taking into account the tonnages that the applicant forecast they would recycle in the application form, the returns received covered 92% of the total tonnages applied for.

Quality assurance of data returns was carried out to check for duplicates and incorrect EWC codes. Reported tonnages were also compared to tonnages at the time of application to check for inconsistencies.

No attempt has been made to estimate data in the waste data tables for sites in which returns have not been submitted. Prior to the publication of the waste data tables, attempts have been made to do so based on the tonnages that operators applied for in the original application form. However, historical data indicates that doing so overestimates by a significant margin the actual tonnages processed, as sites typically process less than 15% of the tonnages stated in the original application form. Additionally, sites which do not submit a return are more likely to be those that have not operated during the year.

Table 10. Recycling by complex exempt activities in Scotland in 2013, by exemption paragraph

Paragraph	Tonnes in 2013
7	457,060
8(2)	50,980
9	485,226
10	285,285
12	10,372
19	1,875,660
42	70
45	108,976
47	8,171
50	1
Total	**3,285,063**

[10] More details on waste management exemptions can be found in Appendix 1

The waste managed in the 2013 complex exemption dataset was greater than the 2012 dataset when compared in a like-to-like manner. Table 11 below compares the 2012 complex exemption data with the 2013 complex exemption data.

Table 11. Comparison of compex exemption tonnages in 2012 and 2013.

Year	Tonnes
2011	1,958,408
2013	3,285,063

4.6 Aggregates recycled in Scotland

This section describes how we report on waste recycled into aggregates in Scotland. Data is provided by Zero Waste Scotland (ZWS) taken from its Aggregates Quality Protocol Supplier Directory. Further details of the Aggregates Quality Protocol Supplier Directory and the dataset provided by ZWS can be found in Appendix 1.

For 2013 data was not able to be obtained for aggregate producers. Many aggregate producers operate under a simple waste exemption, for which there is no legal requirement to provide data returns to SEPA. As no data was available, we have used the 2012 aggregate dataset as a proxy for 2013. For 2012 there were 42 Scottish sites identified in the Directory as producers of aggregate from waste materials. Recycling data are available for nine producers. These sites correspond to the largest aggregate producers and comprise the majority of aggregate production. The recycling tonnages for the remaining 33 sites were estimated. The estimation was based on the aggregate production range provided to SEPA, which was based on an audit of the site by ZWS. The mid-point of the production range was used for this estimation. The data received from the nine sites and the data estimated from the remaining 33 sites is listed in the Table 12 below.

Table 12. The contribution of actual and estimated data for recycling of aggregate in 2012

Actual/estimated	Number	Tonnes	% of total
Actual	9	721,335	65%
Estimated	33	390,000	35%
Total	**42**	**1,111,335**	**100%**

5 Recovered

5.1 Introduction

This section describes how we report the recovery of waste via incineration. The methodology covers WFAS; we do not report separate commercial and industrial (C&I) and construction and demolition (C&D) waste. There is a separate methodology for household waste recovered by incineration in Section 9.2.6. We use a separate section (see 6.3) for waste disposed by incineration, but the methodologies are the same as that described in the following section.

In the waste data tables “Recovered by incineration” means that waste has been incinerated at a facility that has been accredited as meeting the energy efficiency standard of a recovery facility as defined in the Waste Framework Directive. “Recovered by co-incineration” means waste incinerated at a facility that normally generates energy from incineration of non-waste sources such as coal or gas. This may include, for example, a cement kiln that normally uses natural gas as an energy source. “Disposed by incineration” means waste incinerated at an incineration facility that is not accredited as meeting the energy efficiency standard of a recovery facility.

The following methodology is split into two sections:

- recovery by incineration and co-incineration within Scotland;
- recovery by incineration outside Scotland.

Waste type descriptions are separated into non-hazardous/hazardous using European Waste Catalogue (EWC) codes.

5.2 Recovery by incineration and co-incineration within Scotland

A list of Scottish incinerators is maintained and checked with SEPA regulatory staff annually, prior to starting the analysis. For co-incinerators, we exclude any non-waste fuels from our analysis. There were 17 operational sites used in the final 2013 analysis. Eight sites reported quarterly using the licensed/permitted site return form; a further 9 sites reported annually via monitoring returns supplied to SEPA.

In 2013 there were no Scottish facilities accredited by SEPA as a recovery incinerator under the definition of the Waste Framework Directive. Consequently, all waste incinerated in Scotland is either classified as waste disposed by incineration or waste recovered by co-incineration.

In the majority of cases waste data are supplied as EWC codes, which are aggregated into final reporting categories. For two sites, where EWC codes were missing, we consulted SEPA colleagues to check permitted waste type(s) and assigned tonnage to the most appropriate EWC code based on the information available.

The origin of waste incinerated (i.e. Scottish/non-Scottish) is only reported for sites using the licensed/permitted site returns. For the remaining nine sites, origin of waste is not a reporting requirement. SEPA regulatory staff provided estimates (% splits) based on their knowledge of the site.

5.3 Recovery by incineration outside Scotland

Wastes recovered by incineration outside Scotland were taken from Table D (Waste sent off site) of the site returns, with a management method of 'incineration' at the next site. In 2013 there were 20 operators that sent waste for incineration outside Scotland.

The following assumptions were made for type of incinerator the waste was sent to:

- All incinerators in the UK are disposal. As there are some incinerators in Wales that are recognised as recovery facilities, where possible attempts were made to determine the facility and the type of incinerator for waste sent to Wales.
- All incinerators in Europe outside the UK are recovery

It should be noted that this methodology will not capture waste that is transferred to a temporary storage facility outside Scotland before sent to a final incineration facility. In 2013 there was 20,907 tonnes of waste coded as combustible waste (refuse derived fuel – EWC code 19 12 10) recorded as transferred off-site direct to an interim facility outside Scotland. This is 27% of the total tonnages of waste recorded as sent direct to incineration outside Scotland, a significant increase from 7% in 2012. SEPA will review the incineration method prior to the publication of the 2014 dataset to consider how best to take into account these tonnages in the incineration dataset.

6 Disposed

6.1 Introduction

This section describes how we report the disposal of wastes via landfill and incineration. The data are for WFAS; we do not report separate commercial and industrial (C&I) and construction and demolition (C&D) waste. There are separate methodologies for household wastes disposed via landfill and incineration, which are described in Sections 9.2.5 and 9.2.6.

The following methodology is split into two sections:

- waste disposed via landfill;
- waste disposed via incineration.

Waste type descriptions are separated into non-hazardous/hazardous using European Waste Catalogue (EWC) codes.

6.2 Waste disposed via landfill

Data on waste disposed by landfill in Scotland and elsewhere was taken from the licensed/permitted site returns dataset.

The data for landfilled in Scotland was taken from Tables B (Waste inputs to site) and C4 (Waste landfilled on-site after treatment – landfill sites only) of the licensed/permitted site returns, with the management method 'landfill'. Along with the standard data checks detailed in Appendix 1, we also checked the correct use of 'landfill' as a management method in Tables B and C4. There were 60 Scottish landfill sites included in the analysis. Information from Table B on the origin of waste was used to split data into Scottish and non-Scottish waste landfilled in Scotland.

The data for Scottish waste landfilled outside Scotland was taken from Table D (Waste sent off site) for all wastes sent outside Scotland with a management method of 'landfill' at the next site. There were 13 operators that sent waste for landfilling outside Scotland in 2013. Scottish waste that does not pass through a Scottish waste management site before being landfilled elsewhere will not be captured using this method.

6.3 Waste disposed via incineration

The methodologies for *recovery by incineration* and *disposed by incineration* (for *in Scotland* or *elsewhere*) are the same. Please see section 5 (Recovered) for further details.

7 Special waste

For all the other analyses described in this document (recycled, recovered, disposed) waste tonnages are categorised as hazardous or non-hazardous. The special waste data presented in the data tables is the summed hazardous component of all these separate analysis.

8 Imports and exports

The 2013 data for waste imported to Scotland and exported from Scotland was derived from licensed/permitted site returns. Imports were compiled from waste inputs to all sites where the origin of the waste was reported as a location outwith Scotland in site returns Table B. Exports were compiled from waste outputs from all sites where the destination was reported as a location outwith Scotland in site returns Table D.

Origin and destination were reported by three geographical locations:

- rest of the UK;
- Europe;
- outwith Europe.

Waste imported or exported directly to and from Scotland that does not pass through a Scottish waste management site will not be captured using this methodology.

9 Household waste

9.1 Introduction

This section describes how we report on household waste generated in Scotland; and Scottish household waste managed in Scotland or elsewhere. Data is taken from all 32 Scottish local authority returns using the web-based reporting tool WasteDataFlow (WDF). Further details of the WDF dataset can be found in Appendix 1. Throughout this section reference is made to question numbers on WDF.

In 2013 local authorities had the option to submit returns either quarterly or annually. Seven authorities submitted their return annually, while the remaining twenty five authorities submitted quarterly. Where returns were submitted quarterly, SEPA analysed the aggregated quarters in an annualised dataset. All returns were checked and verified by SEPA staff for data entry errors, consistency with previous returns and consistency with the site returns dataset.

All waste collected is reported in WDF in the same return period in which it is sent to management. This allows balancing of the waste generated and waste managed for a period. However, it does mean that a small amount of the waste generated in any reporting period may be rolled over from the previous reporting period.

9.2 Methodology

9.2.1 WasteDataFlow question 100

2013 is the first full year in which household data was analysed using the new WDF question 100 (Q100). Data entry using Q100 is via building a graphical 'tree' that depicts the movement of waste in a chain. Each 'branch' of the tree is associated with a waste facility and tonnage inputs to and outputs from each facility are reported.

Question 100 covers the following waste management categories:

- wastes sent direct to landfill, incineration and composting facilities, and waste sent to the same facilities following the sorting/treatment of mixed wastes e.g. at a materials recovery facility (MRF) or mechanical biological treatment (MBT) plant

- segregated recyclates sent direct to re-processors and reuse facilities, and waste sent to the same facilities following the sorting/treatment of mixed wastes (e.g. MRFs, MBT)

A "primary facility" in Q100 is a facility where the authority records waste as sent direct from collection. Inputs tonnages to the facility at this level are broken down into three categories by local authorities: Household, Commercial, Industrial. The household tonnages can be directly obtained from the data for these facilities. are directly used for as the household waste generated.

Where the facility is not a primary facility (i.e. the waste sent to landfill is recorded as an output from another facility such as a materials recycling facility), the household waste tonnage is not specifically recorded. In this instance the household waste was calculated by applying the percentage household waste at the primary level in the tree to the total tonnage of waste sent to the facility. For example, if waste inputs to a MRF facility is 80% household wastes, the output rejects from the MRF sent to landfill will be designated as 80% household in origin.

9.2.2 Benefits of Question 100

There are two principle improvements to data quality brought about by the introduction of Q100:

- Prior to the introduction of Q100, information on the geographical destination of outputs from facilities such as MBT or MRF plants was not recorded and was estimated[11]. The introduction of Q100 removes the need to estimate any geographical information, by capturing the location of each site in the chain. This should mean the accuracy of reporting waste managed *in Scotland* and *outside Scotland* is improved.

- Prior to the introduction of Q100, the household proportion of total recyclate captured at residual and clean MRFs was not separately recorded and was estimated[11]. The introduction of Q100 removes the need to estimate, by capturing household, commercial and industrial splits of waste inputs to these facilities. This change does however place greater emphasis on the robustness of local authority methods for reporting the household component prior to data entry.

9.2.3 Waste types

A list of SEPA reporting categories and corresponding WDF waste types are provided in Appendix 3 and Appendix 4. The mapping of these categories follows the approach taken by UK reporting to Europe for waste statistics regulation reporting.

9.2.4 Household waste generated

Household waste generated were taken from the household tonnage inputs to primary level facilities in question 100.

9.2.5 Household waste landfilled

Household waste sent to landfill was derived from the waste recorded as sent to a landfill facility in Q100.

9.2.6 Household waste recovered by incineration, recovered by co-incineration, disposed by incineration

The quantity of household waste incinerated in the waste data tables is the gross tonnage input to the incinerator, rather than net incineration[12] reported in the official statistics publication[13].

Incineration tonnages were allocated to the *incineration by recovery* category where the incineration facility meets the Waste Framework Directive criteria for incineration efficiency. Similarly, where waste was incinerated in a co-incineration process, as defined by Environment Agency guidance, the tonnages were allocated to the *incineration by co-incineration* category in the data tables. Where the incinerator was not recognised as meeting the Waste Framework Directive criteria for incineration

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[11] see 2011 quality report http://www.sepa.org.uk/environment/waste/waste-data/waste-data-reporting/waste-data-for-scotland/

[12] Net incineration is the gross inputs, less outputs such as bottom ash and metals which are disposed/recycled.

[13] http://www.sepa.org.uk/environment/waste/waste-data/waste-data-reporting/household-waste-data/

efficiency, the incineration tonnages were allocated to the *incineration by disposal* category. As there are no recognised recovery incinerators in Scotland, all incineration in Scotland falls under either the *recovery by co-incineration* or the *disposal by incineration* category. It was assumed that all waste exported outside the UK was sent for *incineration by recovery*, and waste exported to an England incinerator was sent to *incineration by disposal* or *incineration by co-incineration*.

9.2.7 Household waste recycled

The quantity of household waste recycled is the net sum of household waste recorded as sent to re-processor facilities in Q100. This includes waste sent direct to a reprocessor from collection and also the recyclable materials sent to a re-processor following sorting of mixed wastes at a waste treatment facility (e.g. MRFs, MBT).

Under Scotland's Zero Waste Plan the compost-like output (CLO) from MBT of household waste, and recycled metal and ash from incineration of household waste do not count towards household recycling targets and are excluded from household waste recycling figures. These materials has not been included in the recycling figures in the household waste data tables.

9.2.8 Household waste prepared for reuse

The quantity of household waste prepared for reuse is the net sum of household waste recorded as sent to reuse facilities in Q100, either directly or as outputs from a sorting facility.

9.2.9 Household organic waste recycled

The quantity of household organic waste recycled is the net sum of household waste recorded as sent to organic recycling facilities in Q100. There are three organic recycling facility types in Q100: windrow composting, in-vessel composting, and anaerobic digestion facilities.

All organic wastes were included in the 2013 household recycling figures, regardless of whether they were composted at a PAS100/110-accredited facility. In 2014 only PAS100/110-accredited facilities will considered for the recycling data in line with Scotland's Zero Waste Plan.

9.2.10 Household waste managed by other methods

Under Scotland's Zero Waste Plan the compost-like output (CLO) from MBT, and recycled metal and ash from incineration of household waste do not count towards household recycling targets and are excluded from household waste recycling figures. These materials have been allocated into the "Other waste managed" category in the household waste data tables.

9.2.11 Final destination reporting

The geographic allocation (Scotland / Outwith Scotland) for household recycling / disposal / recovery relies on the accurate reporting of the final destination of waste materials. For example, a final destination for glass bottles would be the site where the bottles are reprocessed into new materials. A final destination for rejected material from a MRF might be landfill or incineration.

SEPA guidance requires authorities to report the final destination of the waste in Q100 (i.e. the facility where waste is recycled). Waste often goes through a complex chain of sites before reaching it's final destination. This, together with the reluctance

of some operators to report where waste is sent due to commercial reason, means many authorities struggle to obtain final destination information for the WDF report. Although the roll out of Q100 has improved final destination reporting, many authorities still continue to report MRFs as final destinations. The Scottish government, in partnership with Zero Waste Scotland, have convened a working group to address the issues that local authorities face in ascertaining and reporting on correct final destinations.

The geographic information for household waste managed, in particular the household waste recycled, should therefore be treated with caution in the 2013 data tables.

10 Further information

Contacting Us

If you have any queries on the contents of this document or the accompanying waste data tables, please contact the Data Unit by email, phone or in writing.

By Email (via our SEPA mailback form)

www.sepa.org.uk/about_us/contacting_sepa/by_email.aspx

By Phone

Telephone 01786 457700 (normal office hours are Mon-Fri 9am- 5pm).

By Post

Data Unit
SEPA Corporate Office
Strathallan House
Castle Business Park
Stirling
FK9 4TZ

Appendix 1

Datasets used in the 2013 methodology

Scottish licensed/permitted site returns

Approximately 900 individual licences submit quarterly returns to SEPA via email or post. A copy of the return form can be downloaded from the SEPA website[14]. The returns dataset is managed and checked by SEPA. The return form consists of Table B (Waste inputs to site), Table C (Waste treated on site), Table C4 (Waste landfilled on-site after treatment on-site – landfill sites only) and Table D (Waste sent off site).

In 2013 an 92% return rate was achieved for those sites from which we expected to receive returns. No attempt was made to estimate data where returns were not received.

SEPA carried out quality assurance of the dataset that included comparing individual site data with previous quarters/years, consistency of EWC codes with the description of waste provided by the operator and missing data. Submissions were manually collected, uploaded and checked. SEPA is currently developing an on-line reporting system for licensed/permitted sites which will improve processing and quality assurance of waste returns.

Household wastes managed by Scottish local authorities (WasteDataFlow[15])

In 2013, all 32 Scottish local authorities reported on a quarterly or annual basis using an electronic return system called WasteDataFlow (WDF). WDF is a UK wide system administered by Defra. Local authorities are responsible for entering data, which cannot be modified by SEPA. Data entry is via a series of numbered questions[16].

In 2013 there was a 100% response rate. SEPA reviewed annual data using a verification tool and informed local authorities where possible inconsistencies required checking. Data checking included the consistency of reported tonnages collected and managed for residual waste, segregated recycling and organic wastes.

Further details of the changes to reporting brought about with the introduction of Question 100 during 2013 are provided in section 9.

Wastes managed by complex exempt activities in Scotland

Some waste management activities are exempt from licensing if they meet the requirements detailed in Regulation 17 of the Waste Management Licensing (Scotland) Regulations 2011. Exemptions are split into ‘simple’ and ‘complex’ activities. Simple exempt activities are not required to report to SEPA. Operators of complex exempt activities register with SEPA annually and are required to submit

[14] http://www.sepa.org.uk/environment/waste/waste-data/guidance-and-forms-for-operators/licensed-and-permitted-sites/

[15] www.WasteDataFlow.org/

[16] www.wastedataflow.org/documents/guidancenotes/Scotland/GeneralGuidance/Scotland_WDF_User_Guidance_Rev_Oct_12.PDF

annual data returns containing the types and quantities of waste managed. Further information on exempt activities is available on SEPA's website[17].

Scottish accredited packaging waste re-processors

Scottish re-processors of packaging waste can register with SEPA to become an accredited re-processor[18]. Accredited businesses can issue and sell evidence of recycling and recovery to directly registered obligated producers and packaging compliance schemes.

The number of re-processors applying for accreditation in Scotland in a given year varies by a relatively small amount. There is a significant financial incentive to register larger businesses. Smaller businesses are suggested to balance the extra administration costs under the accreditation scheme with the value of recycling credits in a given year. If tonnage and/or prices become too low, they may choose not to register in the following year.

UK packaging waste recycled by Scottish re-processors (so called 'scheme data') is reported quarterly and audited annually by SEPA. In addition to scheme data, at the time of registration for a forthcoming year re-processors also provide details of any non-packaging waste and non-UK packaging waste recycled (so called 'non-scheme' data). Non-scheme data is not audited by SEPA and quality is therefore uncertain.

An accredited re-processor is credited with recycling UK-sourced packaging waste; they are not required to provide a country-specific breakdown of the origin of waste in their returns.

Zero Waste Scotland Aggregates Quality Protocol Supplier Directory

Zero Waste Scotland, working in liaison with SEPA, has created a free online Directory of Recycled Aggregate Producers in Scotland who are working to the WRAP Aggregates Quality Protocol. The Directory currently contains 42 sites that are capable of producing recycled aggregates which meet the terms of the aggregates protocol and have ceased to be waste.

The producer sites listed on the Directory have been audited and were found to be working to the aggregates protocol with the required acceptance criteria, management systems, production control, testing regimes and paperwork in place. These sites have therefore been identified as recycling sites and the aggregates produced have been included in the recycling data produced by SEPA.

Data from these sites was collected in 2012 by ZWS and provided to SEPA for subsequent analysis. Reporting is not mandatory for these operators, and in 2013 the data was not able to be provided so the 2012 data was used as a proxy. SEPA is investigating alternative options to collect this data for 2014. The method below refers to the 2012 reporting year.

As this was the first year collecting data from producer sites, the nine largest sites manufacturing aggregates from waste (by volume) were targeted with a view to

[17] www.sepa.org.uk/waste/waste_regulation/application_forms/exempt_activities.aspx

[18] http://www.sepa.org.uk/regulations/waste/packaging-waste/

collecting data from all sites for the 2013 data. The nine sites were each capable of producing more than 50,000 tonnes of aggregates a year, based on their min/max production figures.

These sites were contacted by ZWS and asked to provide their input, sales and output tonnages for 2012. In most cases operators were sent a standard spreadsheet to complete although some data was also received by email or telephone. Of the nine sites five provided all three sets of data, two provided two sets of data and two further sites provided sales figures only. EWC codes for the waste inputs were not provided in all cases.

For 2012 there were 42 Scottish sites identified in the Directory as producers of aggregate from waste materials. For each site, there was an estimated aggregate production range provided to SEPA, which was based on an audit of the site by ZWS. For the 2012 calendar year, actual production data was provided to SEPA for nine sites. These nine sites correspond to the largest aggregate producers and comprise the majority of aggregate production.

Although the nine largest sites provided data, only seven provided data for waste generated, with the remaining two providing aggregate production data only. Of the seven sites that provided generation data, only four split the waste generated by EWC code. The remainder were reported as a total tonnage figure.

For sites where input tonnages were not available, the input tonnage was estimated based on the ratio of inputs and outputs from the seven sites where data was available. The average percentage of waste inputs recycled into aggregate for these seven sites was 79.25%. For the remaining 35 sites, the inputs were estimated by dividing the production by 0.7925, and the waste types generated allocated according to the proportion in the table below. This proportion is based on the producers that provided waste input data by EWC code.

Table 13. Inputs to aggregate producers by reporting category

Actual/estimated	Tonnes	% of total
Waste from construction and demolition	162,253	49%
Soils	167,425	51%
Total	**329,678**	**100%**

For sites where waste generation was unavailable, the waste generated tonnages were estimated from the average of the inputs and outputs from sites where input tonnages were available. There were seven sites with input tonnages available – the four sites which reported the input tonnage by EWC code and a further three sites that reported input tonnages as an absolute tonnage.

As the waste input categories were only available for four aggregate producers, these categorisations should be treated with caution. It is expected that inputs by EWC code will be available for all sites for the 2013 data publication.

The contribution of actual and estimated waste generated tonnages for 2012 is depicted in the table below.

Table 14. The contribution of actual and estimated waste generated for aggregates in 2012

Actual/estimated	Number	Tonnes	% of total
Actual	7	684,158	48%
Estimated	35	729,371	52%
Total	**42**	**1,413,529**	**100%**

Appendix 2

Table 15. Conversions from operator type to SIC group used in the C&I waste generated methodology[19]

Type of operator	SIC group
Oil industry	Mining and quarrying

Table 16. Wet and dry conversion factors used in the C&I waste generated methodology

Waste Type	Factor
Industrial effluent sludges	multiply wet weight by 0.27
Sludges and liquid wastes from waste treatment	multiply wet weight by 0.27
Common sludges	multiply wet weight by 0.20
Dredging spoils	divide wet weight by 1.91

Source: Defra

Table 17. Standard assumptions used to assign SIC codes to waste types in the C&I waste generated methodology

EWC chapter or code	Material or activity	Origin of waste	Sector assumption
01	Minerals	All	Mining and quarrying
02 01	Agriculture	All	Agriculture
02 02 - 02 07	Food	All	Food and drink
03 01 - 03 02	Wood	All	Wood products
03 03	Paper	All	Other manufacturing
04	Textiles	All	Other manufacturing
05	Oil and gas industry	All	Mining
06	Chemicals	All	Chemical industry
07	Chemicals	All	Chemical industry
08	Chemicals	All	Chemical industry
09	Photographic	All	Other manufacturing
10 01	Power stations	All	Power industry
10 02 to 10 14	Manufacturing	All	Other manufacturing

[19] www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/standard-industrial-classification/index.html

EWC chapter or code	Material or activity	Origin of waste	Sector assumption
11	Manufacturing	All	Other manufacturing
12	Manufacturing	All	Other manufacturing
13	Oils	For non-local authority waste	Apply percentage B[6]
13	Oils	Local authority waste or site[1]	Household
13	Oils	Local authority waste or site[2]	Apply local authority household/commercial split[5]
14	Solvents	All	Apply percentage A[6]
15 01	Packaging	For non-local authority waste3	Commerce
15 01	Packaging	For non-local authority waste4	51% industry (SIC A-E) 49% commerce[6]
15 01	Packaging	Local authority waste or site1	Household
15 01	Packaging	Local authority waste or site2	Apply local authority household/commercial split[5]
15 02	Cloths etc.	All	Commerce
15 02	Cloths etc.	All	51% industry (SIC A-E) 49% commerce[6]
16 01	ELVs	For non-local authority waste	Apply percentage D
16 01	ELVs	Local authority waste or site1	Household
16 01	ELVs	Local authority waste or site2	Apply local authority household/commercial split[5]
16 02	WEEE	For non-local authority waste	Apply percentage C[6]
16 02	WEEE	Local authority waste or site	Apply local authority household/commercial split[5]
16 03	Off-spec products	All	51% industry (SIC A-E) 49% commerce[6]
16 05	Gas bottles, chemicals	For non-local authority waste	Apply percentage F
16 05	Gas bottles, chemicals	Local authority waste or site	Apply local authority household/commercial split[5]
16 06	Batteries	For non-local authority waste	Apply percentage E[6]
16 06	Batteries	Local authority waste or site	Apply local authority household/commercial

EWC chapter or code	Material or activity	Origin of waste	Sector assumption
			split[5]
16 07	Tanks	All	Apply percentage B[6]
16 08	Catalysts	All	Chemical industry
16 09	Oxidisers	All	Chemical industry
16 10	Aqueous liquid	All	Apply percentage G[6]
16 11	Linings	All	Other manufacturing
17	Construction	All	Construction
18	Healthcare	All	Commerce
19 01 - 19 07	Waste management	All	Waste management
19 08	Untreated sewage sludge	Direct from sewer	Not applicable
19 08	Treated sewage sludge	STW or WWTW	Water industry
19 09	Water sludges	All	Water industry
19 10 - 19 13	Waste management	All	Waste management
20 01	Separate fractions	For non-local authority waste[3]	Commerce
20 01	Separate fractions	For non-local authority waste[4]	51% industry (SIC A-E) 49% commerce[6]
20 01	Separate fractions	Local authority waste or site[1]	Household
20 01	Separate fractions	Local authority waste or site[2]	Apply local authority household/commercial split[5]
20 02	Biodegradable	For non-local authority waste	Commerce
20 02	Biodegradable	Local authority waste or site[1]	Household
20 02	Biodegradable	Local authority waste or site[2]	Apply local authority household/commercial split[5]
20 03 01	Mixed waste	For non-local authority waste[3]	Commerce
20 03 01	Mixed waste	For non-local authority waste[4]	51% industry (SIC A-E) 49% commerce[6]
20 03 01	Mixed waste	Local authority waste or site[1]	Household
20 03 01	Mixed waste	Local authority waste or site[2]	Apply local authority household/commercial split
20 03 02	Markets	All	Commerce
20 03 03	Street cleaning	All	Commerce
20 03 04	Septic tank sludge	All	Not applicable

EWC chapter or code	Material or activity	Origin of waste	Sector assumption
20 03 06	Sewage cleaning	All	Water industry
20 03 07	Bulky	For non-local authority waste[3]	Commerce
20 03 07	Bulky	For non-local authority waste[4]	51% industry (SIC A-E) 49% commerce[6]
20 03 07	Bulky	Local authority waste or site[1]	Household
20 03 07	Bulky	Local authority waste or site[2]	Apply local authority household/commercial split[5]
20 03 99	Other MSW	For non-local authority waste[3]	Commerce
20 03 99	Other MSW	For non-local authority waste[4]	51% industry (SIC A-E) 49% commerce[6]
20 03 99	Other MSW	Local authority waste or site[1]	Household
20 03 99	Other MSW	Local authority waste or site[2]	Apply local authority household/commercial split[5]
20 codes	Local authority waste	Local authority waste sent to non-local authority site	Apply Scotland household/commercial split[5]

[1] If site only accepts household waste
[2] If site accepts household and commercial or industrial waste
[3] If site only accepts commercial waste
[4] If site only accepts commercial and industrial waste
[5] Local authority household/commercial split is the relative proportion of household and commercial waste collected by the individual local authority.
[6] Refer to Table 18 below.

Table 18. Assignment of waste types to industry sector

Waste Type	Agriculture Forestry Fishing	Mining & quarrying (inc oil & gas extraction)	Food & drink mfr	Mfr of wood products	Chemical Mfr	Other Mfr	Power industry	Water industry	Waste Mgt	Construction	Commerce	Households
Spent solvents (A)	0.0%	0.0%	0.0%	0.0%	99.3%	0.4%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%
Used oils (B)	9.5%	18.2%	0.1%	0.1%	2.9%	7.5%	1.1%	0.0%	0.4%	0.0%	59.1%	1.1%
Discarded equipment ©	0.0%	0.8%	0.3%	0.0%	0.6%	0.4%	0.0%	0.0%	20.9%	0.0%	33.2%	43.9%
Discarded vehicles (D)	3.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.4%	0.0%	47.7%	43.7%
Batteries & accumulators wastes (D)	7.2%	3.3%	0.0%	0.1%	0.5%	5.5%	1.5%	0.0%	1.1%	0.0%	73.1%	7.6%
Gas Bottles (F)	0.0%	29.3%	0.0%	32.4%	0.0%	16.7%	3.5%	0.0%	0.0%	0.0%	18.1%	0.0%
Aqueous Wastes (G)	0.0%	28.1%	0.0%	29.1%	0.0%	21.7%	2.4%	0.0%	0.0%	0.0%	18.7%	0.0%
51% industry 49% commerce (A - E)	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	0.0%	49.0%	0.0%

Notes

1. Percentages A-G refer to the percentage split of the waste across the sectors from the SEPA business waste survey data 2010. For certain generic wastes that are produced by most economic sectors such as oils, batteries, gas bottles the 2010 percentage split was used to apportion these wastes across the sectors for 2013. For example, Percentage B was applied for used oils. This means that the total quantity of oil waste generated in 2013 was apportioned across the economic sectors (1-12 in this example) in accordance with the percentage split from the 2010 data as indicated in the table below:

1. 51% industry (SIC A-E) 49% commerce refers to the average overall industrial/commercial split of waste from three recent C&I waste generation studies. These were the England C&I survey 2009[20], the Wales C&I survey 2009[21] and the Scotland C&I data 2011[22]. SIC A-E refers to all industrial sectors excluding construction.

[20] http://archive.defra.gov.uk/evidence/statistics/environment/waste/documents/stats-release101216.pdf

[21] http://wales.gov.uk/statistics-and-research/industrial-commercial-waste-survey/?lang=en

[22] http://www.sepa.org.uk/environment/waste/waste-data/waste-data-reporting/business-waste-data/

Appendix 3

Table 19. Segregated Household waste categories for SEPA reporting and WasteDataFlow

SEPA reporting	WasteDataFlow	Hazardous (H) / non-hazardous (NH)
Animal and mixed food waste	Waste food only	NH
Animal and mixed food waste	Mixed garden and food waste	NH
Animal and mixed food waste	Vegetable oil	NH
Batteries and accumulators wastes	Automotive batteries	H
Batteries and accumulators wastes	Post-consumer, non-automotive batteries	NH
Construction and demolition waste	Rubble	NH
Construction and demolition waste	Plasterboard	NH
Discarded electrical and electronic equipment	WEEE - Large domestic apps	H
Discarded electrical and electronic equipment	WEEE - Small domestic apps	H
Discarded electrical and electronic equipment	WEEE - Cathode ray tubes	H
Discarded electrical and electronic equipment	WEEE - Fridges and freezers	H
Discarded machines and equipment components	WEEE - Fluorescent tubes and other light bulbs	H
Discarded vehicles	Bicycles	NH
Glass wastes	Green glass	NH
Glass wastes	Brown glass	NH
Glass wastes	Clear glass	NH
Glass wastes	Mixed glass	NH
Household and similar wastes	Furniture	NH
Household and similar wastes	Bric-a-brac	NH
Household and similar wastes	Mattresses	NH
Metal wastes, ferrous	Steel cans	NH
Metal wastes, mixed ferrous and non-ferrous	Mixed cans	NH
Metal wastes, mixed ferrous and non-ferrous	Other scrap metal	NH
Metal wastes, non-ferrous	Aluminium cans	NH
Metal wastes, non-ferrous	Aluminium foil	NH
Mixed and undifferentiated	Cardboard beverage packaging	NH

SEPA reporting	WasteDataFlow	Hazardous (H) / non-hazardous (NH)
materials		
Mixed and undifferentiated materials	Other materials	NH
Off-specification chemical wastes	Aerosols	NH
Off-specification chemical wastes	Fire extinguishers	H
Off-specification chemical wastes	Gas Bottles	H
Off-specification chemical wastes	Ink and toner cartridges	NH
Off-specification chemical wastes	Paint	NH
Paper and cardboard wastes	Paper	NH
Paper and cardboard wastes	Card	NH
Paper and cardboard wastes	Books	NH
Paper and cardboard wastes	Mixed paper and card	NH
Paper and cardboard wastes	Yellow pages	NH
Plastic wastes	Mixed plastics	NH
Plastic wastes	Mixed plastic bottles	NH
Plastic wastes	PET	NH
Plastic wastes	HDPE	NH
Plastic wastes	PVC	NH
Plastic wastes	LDPE	NH
Plastic wastes	PP	NH
Plastic wastes	PS	NH
Plastic wastes	Other plastics	NH
Plastic wastes	Video tapes, DVDs and CDs	NH
Rubber wastes	Car tyres	NH
Rubber wastes	Van tyres	NH
Rubber wastes	Large vehicle tyres	NH
Rubber wastes	Mixed tyres	NH
Soils	Soil	NH
Textile wastes	Textiles and footwear	NH
Used oils	Mineral oil	H
Vegetal wastes	Green garden waste only	NH
Vegetal wastes	Other compostable waste	NH
Wood wastes	Wood for composting	NH
Wood wastes	Wood	NH
Wood wastes	Chipboard and MDF	NH
Wood wastes	Composite wood materials	NH

Appendix 4

Table 20. Mixed household waste categories for SEPA reporting and WasteDataFlow

SEPA reporting	WasteDataFlow	Hazardous (H) / non-hazardous (NH)
Household and similar wastes	Co-mingled materials	NH
Household and similar wastes	Collected household waste: Regular Collection	NH
Household and similar wastes	Collected household waste: Bulky Waste	NH
Household and similar wastes	Collected household waste: other	NH
Household and similar wastes	Civic amenity sites waste: Household	NH
Other mineral wastes	Asbestos Waste separately	H

Appendix 5

European Waste Catalogue

Throughout this document reference is made to both the European Waste Catalogue (EWC) list of wastes and European Waste Catalogue for Statistics (EWC-STAT). A brief explanation of each is given below, along with links to further information.

European Waste Catalogue List of Waste (EWC 2000)

The EWC 2000 is a harmonised, non-exhaustive list of waste types established by the European Commission (2000/532/EC). The list is used to categorise waste based on a combination of what they are, and the process or activity that produces them.

The full EWC 2000 list and further information is available here:

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2000D0532:20020101:EN:PDF

The list is divided into 20 chapters, most of which are industry-based, although some are based on materials and processes. Each chapter is represented by a two-digit code between 01 and 20 and comprises one or more subchapters. Individual waste types are detailed in the subchapters and are assigned a six-digit code that comprises two digits for the chapter, two for the subchapter and two specific to the waste type.

Hazardous wastes are signified by entries where the EWC code is marked by an asterisk (*).

The use of EWC codes to describe waste on waste transfer notes in Scotland has been statutory since April 2004. The majority of statutory waste data returns received by SEPA, including licensed/permitted site returns, exempt activity returns and special waste consignment notes require waste to be classified according to the EWC 2000.

European Waste Catalogue for Statistics (EWC-STAT)

The EWC-Stat is a (mainly) substance-oriented statistical classification of waste established by the European Commission (2004/574/EC). The EWC-STAT contains 13 categories, each represented by a two-digit code between 01 and 13. These are subdivided into individual waste types.

A table of equivalence allows wastes coded in the EWC 2002 to be converted into the EWC-Stat. However, because of the way the coding system operates, it is not possible to do the reverse conversion. The table of equivalence and further information is available here:

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:253:0002:0041:EN:PDF

Appendix 6

Glossary

Anaerobic digestion	A process commonly used to break down biodegradable wastes (e.g. food and green wastes) in the absence of oxygen
In-vessel composting	A group of methods which confine the composting of organic waste materials within a building, container, or vessel
Mechanical biological treatment	A type of waste processing plant that combines sorting and biological treatment
Materials recovery facility	A waste management plant which separates recyclable materials from mixed wastes
Municipal solid wastes	A collective term commonly used to describe household and similar commercial, industrial and institutional wastes
Standard industrial classification	For business establishments and other statistical units by the type of economic activity in which they are engaged
WasteDataFlow	A web-based reporting tool used by Scottish local authorities to report the wastes they manage

Appendix 7

Acronyms

AD	Anaerobic Digestion
C&D	Construction and Demolition
C&I	Commercial and Industrial
CLO	Compost-Like Output
Defra	Department of the Environment Food and Rural Affairs
GVA	Gross Value Added
EA	Environment Agency
EWC	European Waste Catalogue
EWC-STAT	European Waste Catalogue for Statistics
IVC	In-Vessel Composting
MBT	Mechanical Biological Treatment
NUTS	Nomenclature of Units for Territorial Statistics
ONS	Office of National Statistics
SEPA	Scottish Environment Protection Agency
SIC	Standard Industry Classification
WFAS	Waste From All Sources
WDF	WasteDataFlow
WEEE	Waste Electrical and Electronic Equipment

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