Scottish Environment Protection Agency
Buidheann Dìon Àrainneachd na h-Alba

2021 WASTE DATA QUALITY REPORT

Waste from all sources

March 2023

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We call this **One Planet Prosperity**



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1 Introduction

This report describes the methodologies to produce the waste from all sources (WFAS) statistical waste data for Scotland for the 2021 calendar year. The report should be used alongside the 2021 WFAS waste data tables and statistical commentary. The WFAS dataset covers waste generated from households, construction and demolition, or waste from commerce and industry and total waste managed.

The 2021 data are presented as follows:

- The WFAS data tables are presented in a summary and commentary document. This narrative describes the major trends and provides an interpretation of the data. They are located at http://www.sepa.org.uk/environment/waste/waste-data/waste-data-reporting/waste-data-for-scotland/.
- 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/
- 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 WFAS 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.

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 counting of some data: for example, incinerator tonnages are gross input tonnages to incinerators. No attempts have been

[1] https://www.gov.scot/publications/guidance-applying-waste-hierarchy/

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

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, apart from 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. SEPA in partnership with Zero Waste Scotland and the Scottish Government is currently reviewing Scotland's waste data strategy. Part of this review is to identify and address gaps in the reporting dataset.

In 2021, the total amount of Scottish waste managed was 9.94 million tonnes which was 355,000 tonnes (3.6%) more than the amount of waste generated. In historical publications the gap between waste managed and waste generated was larger, with the waste generated typically between 15% - 30% greater than waste managed. SEPA produced a revised methodology for estimating C&I waste data generated (introduced with the 2011 publication) and for C&D waste aggregates recycled (introduced with 2016 publication and applied to historical data). With these new methodologies this gap is not as large, ranging from 9.4% more waste4 generated than managed in 2011 to 7.5% less in 2016.

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)
- Survey of licensed/permitted Scottish waste sites for information about the industry sector of waste reported in site returns (SEPA)
- Household wastes managed by Scottish local authorities (SEPA)
- Wastes managed by exempt activities in Scotland (SEPA)
- Scottish accredited packaging waste reprocessors (SEPA)
- UK packaging waste generated (Defra)
- Hazardous waste data interrogator (Environment Agency)
- Survey of aggregate producers listed in Zero Waste Scotland Aggregates Quality Protocol Supplier Directory (SEPA)
- Transfrontier Shipment of Waste Regulations returns (SEPA)

In some cases, the quantities of household waste and WFAS are counterintuitive. For example, there may be more household waste than WFAS for a given reporting category. This is a product of using different datasets and corresponding methodologies which are not comparable. If such an inconsistency exists, attempts have been made in this document to outline possible reasons for the inconsistency and steps that are planned to address the shortcomings. A summary of the datasets used to prepare components of the WFAS is depicted in Table 1 below. The reporting components listed in Table 1 below which rely on one source of data could be considered more robust than those that rely on multiple sources of data.

Appendix 1 provides a fuller description 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 list of codes that comprise Municipal waste, and the biodegradability factors assigned to these codes for calculation biodegradable municipal waste landfilled.

Appendix 6 provides a 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 7provides a glossary of terms.

Appendix 8 provides a list of acronyms.

1.1 Waste data strategy

Scotland has a waste data strategy, with an associated action plan, the delivery of which is governed by a waste data strategy board[3]. The strategy includes an action to develop an electronic waste tracking system to track waste across the UK. Mandatory digital waste tracking (DWT) is on track to be rolled out from 2023 - 2024[4]. A successful transition to DWT would result in the one waste dataset that would be used to estimate all waste generated and managed, and would replace licenced and permitted site returns, WDF, and the other data sources listed in Table 1 below. This will increase data robustness for waste reporting in Scotland and, as there will be no requirement to conduct business surveys to allocate an industry sector to waste produced, improve the quality of C&I data.

[3] https://www.environment.gov.scot/data/waste-data-strategy/

[4] https://www.gov.uk/government/publications/digital-waste-tracking-service/mandatory-digital-waste-tracking

Table 1 Main Datasets used to produce an estimate of WFAS generated and managed in Scotland 2021

Reporting Components	Waste Management Licence or permit	Waste management exemptions	C&I Sector survey	WasteDataFlow	Aggregate surveys (simple exempt sites)	Producer responsibility (PR) returns	Transfrontier waste shipment returns	Other*
Waste Generated	✓	✓	✓	✓	✓			✓
Non-organic recycling	✓	✓			✓	✓		
Organic recycling by composting or AD	✓	✓						
Incineration	✓						✓	✓
Landfill	✓							

*Other data sources include the English Environment Agency returns to estimate waste solvents exported to England, Annual PPC permits for incinerators without quarterly reporting requirements, and agricultural modelling.

1.2 Revisions Policy

Revisions could occur for various reasons, including when data from third parties is unavailable or provisional at the time of publishing or if there are subsequent methodological improvements or refinements.

The figures are accurate at the time of publication. However, the data may be updated if further revisions are necessary. Normally these revisions will be published concurrent with the next release.

Where there have been changes in methodology for the waste data tables, the complete dataset will be revised for all years to ensure that comparisons between years are valid.

Revisions undertaken since the 2018 publication include:

- Organic wastes composed or digested by anaerobic digestion for 2011, 2012 and 2013 have been revised. In the previous publication, organic wastes recycled by composting or anaerobic digestion were categorised as recycled via a "new method" or an "old method". The methodology change was introduced in 2014. From 2014 onwards only organic wastes composted at a PAS 100 or PAS 110 compliant facility were counted as recycled under the new method, with the remainder counted as "other management". As we move further away from the old composting measure, it becomes less important, and a back series is helpful for understanding changes over a longer period of time. For 2011 – 2013 the wastes that met the PAS 100/110 standard was modelled to produce a back series. Further details are specified in Section 4.2 *Organics recycled in Scotland*.

1.3 Cyber-attack

SEPA was subject to a serious and complex cyber-attack on 24th December 2020 (see https://www.sepa.org.uk/about-us/cyber-attack/). This has left a gap in the WFAS time series, with limited available for 2019 and 2020. This is the first full WFAS publication since 2018 due to the cyber-attack. For waste recovered and waste disposed, 2019 data for waste managed in Scotland was taken from statistics published prior to the cyber-attack or estimated from the available six months of 2019 data recovered following the cyber-attack.

For licensed site returns, recovery of historical data has been achieved up to and including the second quarter of 2019. For other datasets, the amount of recovered data is less complete. There is an incomplete population of historical C&I site surveys, and an incomplete population of surveys for waste produced from aggregate at sites that operate under a simple exemption.

Since the cyber-attack, various tools have been completely re-built to administer, aggregate, analyse, and check waste data returns. Previously, any amendments to tools used to prepare the statistical data were applied to the entire time series. However, since the cyber-attack, due to missing data, this is not possible in some instances. For example, due to the incomplete population of historical C&I surveys, the re-built tool used to prepare the C&I

data cannot be applied to the full time series. The 2011 – 2018 data for C&I waste generated was prepared prior to the cyber-attack, and the 2021 data was prepared using a re-built tool post cyber-attack. With COVID-19 lockdown and other restrictions, and the cyber-attack, care should be taken when comparing the 2021 data with longer term trends.

2 Progress against Targets

2.1 Introduction

The Scottish Government's Making Things Last – A Circular Economy Strategy for Scotland 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.

This policy document sets a number of objective and measurable targets for tracking progress against the objectives specified in the policy. Some of these targets are derived from EU directives such as the Waste Framework Directive. A summary of these targets is provided in Table 2 below.

Table 2 Scottish Government Policy Targets

Target	Year	Set by
Reduce waste generated in Scotland to 93% of 2011 baseline	2017	Scottish Government
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	EU
60% recycling/composting and preparing for re-use of household waste	2020	Scottish Government
No more than 1.26 million tonnes of biodegradable municipal waste to be sent to landfill	2020	EU
70% recycling and preparing for re-use of construction and demolition waste	2020	EU
No more than 5% of all waste to go to landfill	2025	Scottish Government
70% recycling/composting and preparing for re-use of all waste by 2025	2025	Scottish Government
Reduce waste generated in Scotland to 85% of 2011 baseline	2025	Scottish Government

2.2 Recycling of non-hazardous construction and demolition waste

The EU recycling target for 70% recycling and preparing for re-use of non-hazardous construction and demolition (C&D) waste covers the materials listed in Table 3 below:

Table 3. Materials considered in the EU 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 method used to construct the C&D recycling rate is depicted in Figure 1 below:

Figure 1. C&D recycling rate calculation

1.	C&D waste disposed (tonnes)	=	EWC Chapter 17 wastes landfilled or incinerated	*plus*	Estimated EWC Chapter 19 wastes landfilled or incinerated
2.	C&D waste recycled	=	C&D waste generated	*minus*	C&D waste disposed
3.	C&D recycling rate	=	C&D waste recycled	*Divided by*	C&D waste generated

It is assumed that C&D waste that was not landfilled or incinerated was eventually recycled. The C&D waste landfilled and C&D waste incinerated were determined from the amount of Chapter 17 waste landfilled and Chapter 19 waste landfilled. The amount of Chapter 19 waste generated from treatment on site attributable to C&D sources was estimated from the ratio of Chapter 17 waste inputs to site for treatment.

2.3 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 (see Appendix 5), 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. Please refer to Appendix 5 for the full list of municipal waste codes and associated biodegradability factors.

2.4 Percentage of WFAS landfilled

As indicated in section 1, the WFAS generated and WFAS managed does not balance, and can vary by up to 10%. The methodology therefore takes the waste landfilled as a proportion of total waste managed; that is prepared for reuse, recycled, composted, incinerated and landfilled.

Figure 2. Percentage of WFAS landfilled calculation

1. Total waste managed (tonnes)	=	Total waste reused *plus* waste recycled *plus* waste composted *plus* waste incinerated *plus* waste landfilled *plus* other management (tonnes)
2. Percentage waste landfilled	=	$\frac{\text{Waste landfilled (tonnes)}}{\text{Total waste managed (tonnes)}} * 100$

2.5 Percentage of WFAS recycled

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

Figure 3. Percentage of WFAS recycled calculation

1. Total waste managed (tonnes)	=	Total waste reused *plus* waste recycled *plus* waste composted *plus* waste incinerated *plus* waste landfilled (tonnes) *plus* other waste management
2. Percentage recycled	=	$\frac{\text{Waste recycled (tonnes)}}{\text{Total waste managed (tonnes)}} * 100$

2.6 Percentage of WFAS generated compared to 2011 baseline

A simple division of waste generated in the current year to that generated in 2011 has been used for the metric of waste generated compared to a 2011 baseline.

Figure 4. WFAS generated compared to 2011 baseline

$$\text{Percentage waste compared to 2011 baseline} = \frac{\text{Waste generated}}{\text{Waste generated 2011}} * 100$$

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 (hazardous) waste generated
- Packaging waste generated
- Waste generated per unit of gross value added.

The methodology for household waste generated is detailed in Section 9.

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 2021 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 through 2017 but, prior to this, data on the wastes produced by businesses was collected by SEPA using business waste surveys.

Overview

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[5] (SIC) 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 2021 were considered relevant to this study and comprised 655 waste management sites and 377 complex exempt activities (excluding nil returns). The total waste input to these sites was 20.8 million tonnes of which 18.9 million tonnes was from licensed site returns. This compares with 21.3 million tonnes total inputs in 2018, with 18.1 million tonnes from licensed sites.

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;
- 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 2021 were identified from their licensed/permitted site returns by adding together the inputs to all of their sites. These operators excluded those that did not need to be contacted because the origin of waste was clear or were local authority sites. In 2021 there were 36 sites that were contacted.

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. Thirty-three operators provided a return, providing a return rate of 47.5%, compared to 82% return rate in 2018.

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5 http://webarchive.nationalarchives.gov.uk/20160105160709/http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/standard-industrial-classification/index.html

For operators that did not respond to the SIC data request the following approach used:

- Where a survey had been was available for previous years, the SIC group for each EWC code was allocated according to the SIC group split for that EWC code in previous surveys
- Where a survey had not been completed in previous year, the approach for small operators and complex exemptions was followed.

Small waste operators and Complex exemptions

For those in this 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.

For some EWC codes, the sectors were assigned using data taken from a 2010 business waste survey undertaken by SEPA. These EWC codes included packaging waste (EWC Chapter 15), end of life vehicles (Chapter 16), chemicals (Chapter 16), solvents (Chapter 14), and municipal wastes (Chapter 20, from non-local authority sources). The list of EWC codes that were assigned using this method are detailed in Table 17 of**Appendix 2** Appendix 2. In 2021 the business waste survey was eleven years old and may not reflect the current mix of businesses that produce waste in Scotland. The roll-out of mandatory digital waste tracking[6] from 2024 is expected to provide more robust data about the commercial sector that produces waste.

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

[6] Mandatory digital waste tracking is to be introduced from 2023 to 2024, see https://www.gov.uk/government/publications/digital-waste-tracking-service/mandatory-digital-waste-tracking

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 12.7% (2.4 million tonnes) of the licence site return data in 2021. This was slightly above the 2.33 million tonnes inputs to local authority sites in 2018.

Inclusions and exclusions in the dataset

Once the main analysis was complete and SIC codes assigned to all waste tonnages, the inclusion, exclusion or recalculation of specific wastes was necessary 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, 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 2021 there was 55,000 of Chapter 17 wastes in the final dataset that surveys indicated were not from the Construction, Waste management or Household 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. The method of estimation of missing data is described in Table 4 below.

Table 4. 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[7]
Agriculture	Plastics	Often handled by simple exempt activities with no data reporting requirement	Estimated using Agricultural Waste Estimates Model[7]
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.

[7] 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 2021 and amounted to 3.09 million tonnes.

3.3 Construction and demolition waste generated

3.3.1 Introduction

This section describes the methodology for reporting the quantities of Construction and Demolition (C&D) waste generated in Scotland in 2021. 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 2021 uses data from three sources: licensed/permitted site returns, complex exempt activity returns, and aggregate survey data – all of which are managed by SEPA.

In 2021, none of the C&D data sources contained estimated data for non-submitted returns. The aggregates data supplied by ZWS was introduced for the first time in 2012 and the 2012 data was retrospectively applied to the 2011 dataset and to the 2013 dataset to ensure consistency of methodology between years. From 2014 and onwards the aggregate data is provided by SEPA survey. Further details are contained in the section on 'aggregates dataset' and in Appendix 1.

3.3.2 Methodology

Licensed/permitted sites dataset

Data returns from 282 licensed/permitted sites operating in 2021 were used to calculate C&D waste generated. This is slightly less than the 300 sites for the 2018 and 292 sites for the 2017 analyses. Waste with an origin outside Scotland was excluded from the analyses.

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:

Figure 5. C&D waste generated at licensed sites calculation

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

This was calculated at the site level. The difference in inputs minus outputs is estimated as waste generated. This can be waste that has been:

- treated onsite 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. In 2021, this was 175,000 tonnes.

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 Appendix 1. 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. Consequently, the tonnages of waste reported in the complex 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 with expiry dates between 1 July 2021 and 30 June 2022 were used to report on C&D waste (EWC Chapter 17) generated in Scotland. In this period, there were 90 complex exempt activities that recorded inputs of EWC Chapter 17 wastes. This is lower than the 178 exemptions in 2018 and 231 exemptions in 2017. In 2021, of the 90 exemptions in the analysis, 60 were registered under Paragraph 19, 15 under Paragraph 7, with remainder under Paragraphs 45, 7 and 10.

No estimated data were included in the 2021 complex exemptions dataset. All tonnages are self-reported by sites using SEPA's exemptions return form. Further details are given in Section 4.5. The total amount of Scottish C&D waste managed by exempt activities in this period was 837,000 tonnes, which is lower than that reported in 2018 (2.1 million tonnes). It is likely that the reduced tonnages are due to the impact of COVID-19 lockdowns and other restrictions. It should be noted that exemptions with expiry dates of 1 July 2021 -30 June 2022 were first registered from 1 July 2020 – 30 June 2021 during peak COVID-19 restrictions.

Table 5. Reported tonnages of C&D waste from the 2021 exemptions datasets, by paragraph

Paragraph	Tonnes
7	1,500
9	233,000
19	572,000
45	31,000
Total	**837,000**

Aggregates dataset

The quantity of C&D waste processed to produce aggregate at sites operating under a simple waste exemption in 2021 was based on a survey of sites carried out by SEPA. The sites surveyed were taken from the Aggregates Quality Protocol Supplier Directory, a list maintained by Zero Waste Scotland.

To avoid double counting with waste arising from the licensed site and complex exemption datasets, only waste processed under a simple exemption from the aggregates datasets was included in the C&D waste generation data. For 2021, this was 77,000 tonnes, which is lower than the amount arising from simple exemptions in 2017 (430,000 tonnes, the most recent year available). The decrease may be part of a trend to move the processing of these wastes to larger, licensed sites, as evidenced by an increase in aggregates produced from waste at licensed sites (see section 4.7.1 *Aggregates recycled at licensed waste management sites*).

Further details of the Aggregates Quality Protocol Supplier Directory and the aggregates dataset can be found in Appendix 1.

3.4 Special (hazardous) waste generated

The 2021 data for special (hazardous) 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%[8] 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 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[9].

GVA is one of the measures chosen by the Scottish Government for waste prevention. In Scotland's waste prevention plan 'Safeguarding Scotland's Resources'[10] 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 tonnes waste generated per £1,000 GVA in the data tables.

[8] This is based on the Scottish population being 10% of the UK as a whole

[9] https://www.ons.gov.uk/economy/regionalaccounts/grossdisposablehouseholdincome/methodologies/regionalaccounts

[10] 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 recycling of organic waste by composting or anaerobic digestion within Scotland. We assume all waste composted or digested at Scottish sites is Scottish in origin. Organic recycling data are taken from two data sources managed by SEPA: licensed/permitted site returns and complex exemptions. Site returns contributed 99.6% and exemptions 0.4% of the organic waste recycled by composting or anaerobic digestion in Scotland in 2021. Of the total organic waste composted or digested in Scotland in 2021, 95.4% tonnes were composted or digested at PAS 100 or PAS 110 certified sites.

4.2.1 Organic recycling at licensed/permitted sites

The 2021 methodology captures composting of waste using windrow composting, in-vessel composting (IVC), and anaerobic digestion (AD) of organic wastes at licensed/permitted sites (excluding mobile plant licences). 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 and 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 317,000 tonnes was reported, of which

140 tonnes was judged not suitable for composting. This is reduced from the 432,000 tonnes recorded in 2018. The 2021 total comprised of 294,000 tonnes from sites with BSI PAS 100 certification (for producing quality compost) and/or PAS 110 certification (for producing anaerobic digestate) processes, the remaining 24,000 tonnes from sites without these certified processes.

The five largest tonnages for each category from sites with PAS 100 or PAS 110 certification are provided in Table 6 below, and similarly the largest tonnages from sites without these certifications are provided in Table 7 below.

Table 6. The five largest waste types from Table C reported with management method 'composting' from sites with PAS 100 or PAS 110 certification

EWC code	EWC Description	Tonnes
20 02 01	Municipal wastes - biodegradable waste	106,000
20 01 08	Municipal wastes - biodegradable kitchen and canteen waste	174,000
02 02 03	Food wastes unsuitable for consumption	7,000
02 02 02	Animal tissue waste	2,000
02 01 06	animal faeces, urine and manure	1,000

Table 7. The five largest waste types from Table C reported with management method 'composting' from sites without PAS 100 or PAS 110 certification

EWC code	EWC Description	Tonnes
20 02 01	Municipal wastes - biodegradable waste	6,000
20 03 01	Mixed municipal waste	15,000
19 06 04	Digestate from anaerobic digestion	1,000
02 02 03	Animal tissue waste	500
02 02 03	Food wastes unsuitable for consumption	400

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) by specific AD and IVC sites was included in final organics recycling reporting. Since 2013 all the wastes reported as biological treatment by the specific AD and IVC sites have been included. The use of specific AD and IVC sites ensures other forms of biological treatment (e.g. types of sewage sludge treatment) are excluded from reporting.

A total of 216,000 tonnes was reported for BT in 2021, from five sites all with PAS 110 certified processes. The five largest waste types (by tonnes) from sites with PAS 100 or PAS 110 certification are shown in Table 8 below. Wastes from municipal waste collection, from agriculture, and from food and drink processing and manufacture dominate. The 216,000 tonnes reported for BT in 2021 is greater than the 136,000 tonnes reported for BT in 2018.

Table 8. The five largest waste types from Table C reported with a management method 'biological treatment' for specific AD and IVC sites with PAS 100 or 110 certification

EWC Code	EWC Description	Tonnes
20 01 08	Biodegradable kitchen and canteen waste	85,000
02 01 06	animal faeces, urine and manure	37,000
02 02 04	Sludges from on-site effluent treatment of food preparation waste	26,000
02 07 02	Wastes from spirits distillation	12,000
02 01 02	Animal tissue waste	9,000

4.2.2 Exempt composting activity

Some of the composting activity in Scotland is exempt from licensing and is carried out under exemption.

In 2021, Paragraph 12[11] composting represented 2,000 tonnes of waste, of which none were from PAS 100 certified sites. There were no tonnages reported under Paragraph 51, anaerobic digestion of agricultural and distillery wastes. This is lower than 2018, with 21,000 tonnes of waste recorded from Paragraph 12 sites, and 900 tonnes from Paragraph 51 sites.

[11] 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/

The Paragraph 12 data tends to represent smaller tonnage sites and comprised 0.4% of the organics composted or digested in 2021.

For a more general description of the exemptions dataset, including Paragraphs 12 and 51, please see section 4.6.

4.2.3 Scottish organic waste exported for recycling

This methodology describes how we report on the recycling of organic waste outwith Scotland with an intended treatment method of 'Biological Treatment' or 'Composting'.

SEPA site returns data was used for this method. Data was taken from Table D (waste sent off site) where the geographic destination was recorded as Outwith Scotland for the following two management methods:

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

In 2021 a total of 900 tonnes was reported, a reduction from the 17,000 tonnes recorded in 2018, all of which were 20 01 08 (Biodegradable kitchen and canteen waste.

As in previous years, information about PAS certification of composting sites outwith Scotland in 2021 was not available, it was assumed that receiving sites were BSI PAS 100 compliant.

Revisions to 2011 – 2013 Organic Recycling

- From 2014 onwards only organic wastes composted at a PAS 100 or PAS 110 compliant facility were counted as recycled, with the remainder counted as "other management

- For 2011 – 2013, the wastes that met the PAS 100/110 standard was modelled to produce a back series. For each waste category, the proportion of waste that was sent to a PAS 100/110 facility in 2014 was applied to the waste sent for composting for each of the years 2011, 2012 and 2013. For example, if 60% of waste was sent to a PAS 100/110 facility in 2014, then for the back series years of 2011, 2012 and 2013, 60% of waste sent for composting were counted as recycled. The non-PAS 100/110 tonnes were allocated to the "Other Diversion" management category. A method has been implemented for export of Scottish waste for composting or digestion. Please refer to the organics recycling methodology in section 4.2.3 for more details.

4.3 Glass, plastic and wood recycled in Scotland

Data was taken from the 2021 accredited reprocessor (AR) dataset, the 2021 site returns dataset, or annual reports provided by operators of SEPA Pollution Prevention and Control (PPC) permits, all of which are managed by SEPA.

UK packaging waste recycled by Scottish reprocessors (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 reprocessors 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. Since 2014 non-scheme data is either absent for many sites or has been updated in subsequent years. The non-packaging waste from AR records are therefore not considered reliable, and where possible licensed site sites or PPC annual reports were used to obtain this data.

The 2021 AR dataset consisted of nineteen reprocessors: six glass, four glass remelt, ten plastic and five wood. Two of the identified AR reprocessors were licensed waste management sites, and the site returns data were used in place of the producer compliance returns. Not only did this ensure that packaging and non-packaging waste were both captured for these sites, it allowed the identification of the waste origin for these wastes. The quantity of UK packaging waste recycled under the scheme was 195,000 tonnes, which is a reduction of the 226,000 tonnes from 2018. Two licenced sites were identified in the AR reprocessor list, and to capture non-packaging waste, the data returns were used for these sites instead of the AR returns. The waste recycled at these sites was identified by waste treated on site with a management method indicated recycling. The final amount recycled, amounted to 334,000 tonnes. Further details of the accredited reprocessor dataset can be found in Appendix 1.

For glass recycling, the Table B inputs of a limited number of sites act as "feeder" sites to glass recycling facilities in Scotland. The inputs to the feeder sites were used to determine the percentage of glass waste originating in Scotland or outwith Scotland.

Where data was taken from SEPA site returns, the waste that was Scottish in origin was taken from the geographical waste origin specified in the return. For all other sites, it was assumed that the waste was Scottish in origin.

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

Data was taken from the 2021 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.

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. In 2021, 76 sites were included in the final analysis for metal wastes, comprising 646,000 tonnes. Of these, the six largest sites contributed 550,000 tonnes, or 85% of the total. In comparison, in 2018 there were 72 sites in the analysis, comprising 710,000 tonnes.

4.5 Paper sent to site operating under simple exemptions

One historical data gap in the recycling dataset is the amount of Paper and cardboard waste sent to sites that operate under a simple waste management exemption, and then export the waste directly out of Scotland for recycling without moving the waste through an intermediate Scottish licensed waste management site.

SEPA site returns include a field for operators to record a description of the waste destination. Outputs from licensed waste management sites were analysed for names and exemption numbers for several key simple exempt sites in which Paper and card waste is known to be sent. The amount of Paper and cardboard waste in 2021 estimated to enter sites operating under a simple exemption prior to export was 83,000 tonnes.

It should be noted that this methodology does not capture Paper and cardboard waste sent direct to a simple exempt site without first moving through a SEPA licensed site.

4.6 Recycling by complex exempt activities in Scotland

Waste management exemptions[12] 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 2021 there were 639 exempt activities registered under Paragraphs 7, 8(2), 9, 10, 12, 19, 42, 45, 46, 47, 50 and 51 having expiry dates between 1 July 2021 and 30 June 2022. This is a reduction from the 1,047 exemption activities in 2018.

Missing returns (i.e. those registered who had not reported) were chased throughout the reporting period and were prioritised according to tonnage that

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

the applicant forecast they will recycle on the application form. In 2021, SEPA received data returns from 72% of the total number of returns expected, greater than the 62% return rate in 2018. The amount of waste recycled at an exempt site varies considerably, ranging from one to two tonnes, through to hundreds of thousands of tonnes. In 2018, accounting for tonnages that the applicant forecast they would recycle in the application form, the returns received covered 82% of the total tonnages applied for. In 2021 however, it was not possible to calculate a tonnage weighted return rate, as the forecast tonnages were not readily available for all sites.

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 was made to estimate data in the waste data tables for sites in which returns have not been submitted. Prior to the publication of the first set of? waste data tables, attempts had 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 9. Recycling by complex exempt activities in Scotland in 2021, by exemption paragraph

Paragraph	Tonnes
7	480,000
9	574,000
10	205,000
12	2,000
19	609,000
45	41,000
47	3,000
51	19,000

The waste managed in the 2021 complex exemption dataset was 85,000 tonnes (4.2%) less than 2019, and 1.18 million tonnes (58.6%) less than the 2018 dataset when compared in a like-to-like manner. The 2021 dataset includes exemptions that were registered in the last two quarters of 2020 and it is likely that number of returns registered has been impacted by COVID-19 lockdowns and restrictions. Further information about the exemptions dataset is contained in Appendix 1.

4.7 Aggregates recycled in Scotland

This section describes how we report on waste recycled into aggregates in Scotland. There are three sources of data for waste recycled to produce aggregate – the complex exemption dataset (explained in section 4.6 above), the licensed site returns dataset and the aggregates dataset.

4.7.1 Aggregates recycled at licensed waste management sites

Waste recycled to aggregate at licensed waste management sites was estimated from the mixed C&D waste inputs of site returns (Table B) and waste outputs (Table D).

Mixed waste inputs considered included EWC Chapters 17 01 XX, 17 03 XX, 17 05 XX, 17 08 XX, and 17 09 04. These wastes include concrete, bricks, bitumen, soil, plasterboard and general mixed C&D waste. It excludes waste types that would not be expected to contribute to aggregate / soil recycling (e.g. metal wastes, plastic wastes, glass wastes). Inputs designated as brought onto site for landfilling were excluded from the analysis.

For each licensed site taking in mixed C&D waste, non-aggregate waste outputs were subtracted from the inputs, leaving the remainder as aggregate or soil waste either sent off-site for recycling or treated on site to a final product.

Figure 6. Calculation of waste aggregate recycled at a licensed site

1.	Chapter 19 coded waste created from mixed chapter 17 waste inputs	=	Chapter 19 12 XX waste inputs (Table B) **minus** Chapter 19 12 XX waste outputs (Table D) excluding 19 12 09 coded waste (stone, soil) **plus** Chapter 19 12 XX coded waste landfilled on site after treatment (Table C4)
2.	Tonnes of aggregate / soil recycled	=	Mixed C&D waste inputs recorded in Table B (excluding inputs designated to landfill) **minus** Chapter 17 mixed waste outputs (Tables D, C4) **minus** Chapter 19 coded waste created from mixed Chapter 17 waste inputs (see step 1 Above)

The Chapter 19 code waste created from mixed Chapter 17 waste inputs was estimated from the percentage of mixed Chapter 17 waste inputs as a proportion of all waste inputs e.g. if there was 50% of all inputs to the site were mixed C&D waste inputs, then it is assumed that 50% of the 19 12 XX code waste outputs are derived from the mixed Chapter 17 waste inputs.

After deducting the outputs, a total recycling figure was derived by aggregating the tonnage of aggregate / soil recycled from each site.

In 2021, there were 1.8 million tonnes of waste recycled to produce aggregate at sites under a waste management licence. This was an increase of 300,000 tonnes from the 1.49 million tonnes recorded as recycled in 2017, the most recent year available following the cyber-attack, and an increase of 600,000 tonnes from the 1.19 million tonnes recorded as recycled in 2016 (the most recent working recovered following the cyber-attack). The increase could be part of a trend to move the processing of waste to aggregate from sites operating under a simple exemption, to larger, licensed C&D recycling plants using methods such as "Soil Washing"[13].

Waste recycled inside / outside Scotland:

Waste recycled outside Scotland was taken as the tonnages of 19 12 09 coded waste recorded as sent offsite in the site return (Table D) with a geographical destination outside Scotland. In 2017, the most recent year available, 99.9% of C&D waste used to produce aggregate was recycled at Scottish sites. In 2021, there were no C&D wastes recycled outwith Scotland.

Waste of non-Scottish origin:

Waste originating outwith Scotland was taken from the waste origin of the mixed C&D waste in Table B. In 2021, 1,849 tonnes (0.1%) originated outwith Scotland.

Assumptions:

The method assumes that Chapter 19 outputs are created equally for each waste category input i.e. a site with 10% of mixed C&D waste inputs will produce 10% Chapter 19 outputs from this C&D waste. This is unlikely to be reality for individual sites, but probably would likely average out over all sites.

It is also assumed that waste on-site that ceases to be a waste following on-site treatment is an aggregate waste. This is because there is a standard for production of aggregate, which does not exist for metal, glass, or plastic. It is possible that there are other materials such as metals, glass or plastic that some sites are not considered a waste by site operators. If so, the total materials recycled will not change, rather the make-up of the material type being recycled.

4.7.2 Aggregates recycled under simple exemptions

Sites operating under simple exemptions are not required to submit a data return to SEPA. To obtain data from these sites, a survey of sites listed in the Zero Waste Scotland's Aggregates Quality Protocol Supplier Directory was

[13] Soil washing involves the recovery of a range of materials from soils, often extracted from excavation waste sites.

undertaken. Further details of the Aggregates Quality Protocol Supplier Directory and the dataset provided can be found in Appendix 1.

Data received from seven returns amounted to 77,000 tonnes 2021, compared to 430,000 tonnes in 2017 (there was no data for 2018 recovered following the cyber-attack). The reduction in tonnages received in 2021 may be an effect of COVID-19 lockdown and other restrictions. However, there was a 300,000 tonne increase in aggregates produced from waste at licensed sites between 2017 and 2021 and it is also thought this is a consequence of a Scotland wide trend to move the processing of these wastes to larger, licensed C&D recycling plants.

Table 10. Waste recycled by aggregate production at sites operating under a simple exemption in 2021

Waste Category	Simple Exemptions (tonnes)
Mineral waste from construction and demolition	42,000
Mineral wastes from waste treatment and stabilised wastes	2000
Soils	33,000
Total	**77,000**

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) wastes. There is a separate methodology for household waste recovered by incineration in Section 9. Waste disposed by incineration is considered in e a separate section (see section 6.3), but the methodologies for calculating waste recovered and disposed by incineration 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 (R1 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 (D10 facility). It should be noted that a facility accredited as D10 does not imply that energy recovery is not undertaken at the facility. It may be that energy recovery occurs but not to the efficiency standard specified in the Directive, or possibly the facility meets the efficiency standard of the Directive but the operator has not applied for the accreditation. While there are no municipal waste incineration facilities in Scotland that are classified as R1, it is thought that the two main municipal waste incinerators in Shetland and Dundee are not accredited for the latter reason.

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 16 operational sites used in the final 2021 analysis. Ten sites reported quarterly using the licensed/permitted site return form; a further 6 sites reported annually via PPC monitoring reports supplied to SEPA.

In 2021 there were two Scottish facilities accredited by SEPA as a recovery incinerator (R1) under the definition of the Waste Framework Directive, and a third facility with an application in progress.

Where waste data are supplied as EWC codes, data are aggregated into final reporting categories. Where EWC codes were missing on PPC monitoring reports, 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 2021 there were 22 operators that sent waste for incineration outside Scotland.

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

- Where possible attempts were made to determine the facility and the type of incinerator for waste sent to Wales and England. Where the facility was a recognised R1 facility accredited by Environment Agency, the incineration of waste was allocated to the Recovery category. Otherwise, all incinerators in the UK were assumed to be disposal.
- All incinerators in Europe outside the UK are recovery.

5.4 Recovery of refuse derived fuel

Waste coded with EWC code 19 12 10 - combustible waste (refuse derived fuel), was assumed to be ultimately incinerated, even where the next management method in Table D did not indicate incineration. The exception was where the next management method was designated as landfill.

19 12 10 coded waste sent to the UK was assumed to be incinerated by disposal. The 19 12 10 waste maps to the Sorting Residues reporting category.

In 2021 there were 17,000 tonnes of Sorting Residue waste recorded as sent from Scotland to other UK jurisdictions for incineration by recovery, and 1,600 tonnes for incineration by disposal.

5.5 Export of refuse derived fuel

For the Sorting Residues waste category, waste collected under the Transfrontier Shipment of Waste (TFS) regulations was used to obtain data about waste exported outwith Scotland and the UK for incineration. In 2021 there were 61,000 tonnes of waste exported from Scotland outwith the UK with a description of Refuse derived fuel (RDF) or Solid recovered fuel (SRF).

6 Disposed

6.1 Introduction

This section describes how we report the disposal of wastes via landfill and incineration. The data are for total WFAS managed; 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 Section 38.

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 waste landfilled in Scotland was taken from Tables B (Waste inputs to site) and C4 (Waste landfilled on-site after treatment – landfill sites only) in 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 45 Scottish landfill sites included in the analysis for 2021. 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 11 operators that sent waste for landfilling outside Scotland in 2021. 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 (hazardous) waste

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

8 Imports and exports

The 2021 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 Table B of the site returns. Exports were compiled from waste outputs from all sites where the destination was reported as a location outwith Scotland in Table D of the site returns.

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 2021 local authorities submitted returns annually. Returns were checked and verified by SEPA staff for data entry errors and consistency with previous returns.

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. The waste generated figures may include treated waste stockpiled prior to final management. The waste managed figures exclude treated waste held in stockpile at the end of the reporting year.

9.2 Methodology

9.2.1 WasteDataFlow Question 100

Local authorities report waste managed in WDF using Question 100 (Q100). Data entry 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 reprocessors 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. Input tonnages to the facility at this level are broken down into three waste sources by local authorities: Household, Commercial, Industrial. The household tonnages are directly obtained from the data for these facilities. Where the facility is not a primary facility (e.g. 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 are 80% household wastes, the output rejects from the MRF sent to landfill will be designated as 80% household in origin.

9.2.2 Waste categories

Lists 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.

9.2.3 Household waste generated

The quantities and types of household waste generated was taken from the household waste tonnage inputs to primary level facilities in Question 100.

9.2.4 Household waste managed

In the WFAS report, the management of wastes is not separated into the Household, C&I and C&D categories. This is mainly because the primary sources for waste managed, namely licensed and permitted site returns and waste exemptions, do not provide for a split into these categories. For further information about household waste managed, please refer to the household waste official statistics and accompanying quality reports.[14]

[14] https://www.sepa.org.uk/environment/waste/waste-data/

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)

https://www.sepa.org.uk/contact/contact-us-via-email/

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Appendix 1

Datasets used in the 2021 methodology

Scottish licensed/permitted site returns

In 2021 736 individual licences were expected to submit quarterly returns to SEPA via email or post. A copy of the template return form can be downloaded from the SEPA website[15]. The site 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 or incinerated on-site after treatment on-site – landfill and incinerator sites only) and Table D (Waste sent off site).

In 2021 a 90.1% return rate was achieved for those sites from which we expected to receive returns. This is less than the 96.9% return rate achieved in 2018 and slightly less than the 97.2% return rate achieved in 2017. No attempt was made to estimate data where returns were not received.

In 2021 there were 736 sites that were operational and 575 sites not operational. This compares with 774 operational and 484 not operational in 2018 . The decrease in number of operational sites by 71 is likely on going impacts of COVID lockdown and associated restrictions, but there is also some uncertainty about the 2021 population following the cyber-attack.

Table 11. Number of returns received for licenced sites 2017 - 2021

Year	Total sites expected	Total return rate	Incinerator return rate	Landfill return rate	Total waste inputs (million tonnes)
2017	**788**	97.2%	100%	100%	17.27
2018	**806**	96.9%	100%	100%	18.03
2019	Data not available due to cyber attack		100%	100%	Data not available due to cyber attack
2020	Data not available due to cyber attack		100%	100%	Data not available due to cyber attack
2021	**736**	90.1%	100%	96.1%	18.90

Note: Return population excludes sites listed as non-operational for 2021. For a list of operational and non-operational sites refer to the waste capacity report (https://www.sepa.org.uk/data-visualisation/waste-sites-and-capacity-tool/). Return statistics are for sites that have made one or more submissions. It does not consider missing quarters.

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

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. Additionally, checks for the dataset as a whole were undertaken which compared amount of waste for a category or management method by quarter-on-quarter and year-on-year. Submissions were collected, uploaded and checked by SEPA staff with the assistance of various automation and visual tools throughout the process. For 2021, these tools were rebuilt following the 2020 cyber-attack.

Household wastes managed by Scottish local authorities (WasteDataFlow[16])

In 2021, 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[17].

In 2021 there was a 100% response rate. SEPA reviewed the annual data using a verification tool and informed local authorities where possible of inconsistencies that required checking. Data checking included the consistency of reported tonnages collected and managed for residual waste, segregated recycling and organic wastes.

Further details are provided in section 9.2.1 on page 38.

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 some are required to submit annual data returns containing the types and quantities of waste managed. The various categories of waste exemptions that submit a data return are listed in Table 12 below. Further information on exempt activities is available on SEPA’s website[18]. Further information about the methodology for producing data summaries for complex exemptions can be found in section 4.6 on page 28.

Unlike licensed sites, complex exemptions expire after a period of 12 months, after which a return is submitted covering the 12-month duration of the

[16] www.WasteDataFlow.org/

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

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

exemption. For 2021, the exemption population was taken from exemptions that expired between 1 July 2021 – 30 June 2022. It should be noted that the application to register these exemptions was 1 July 2020 – 30tJune 2021, during the COVID-19 lockdown and other restrictions. As depicted in Table 13 below, in 2021 there were fewer operating exemptions (639 activities) compared with 2018 (1047 activities), a likely consequence of COVID-19.

Table 12. Categories of Waste Exemptions

Paragraph	Description	Reporting threshold
7	Land treatment for benefit to agriculture or ecological improvement	All
8(2)	Treatment of non-agricultural land with sludge	All
9	Reclamation or improvement of land	2,500 cubic metres
10	Treatment of waste and storage at a water treatment works and recovery operations and storage at a sewage treatment works	All
12	Composting	>10 tonnes per year
19	Waste for construction and other 'relevant works'	2,500 cubic metres
42	Disposal of waste pesticide or washings in a lined biobed where the waste was produced	
45	Storage and recovery of scrap metal and/or dismantling of depolluted vehicles	
46	The burning of wood or plant tissue at a dock	All
47	Repair and/or refurbishment of WEEE at a secure place	
49	Treatment of waste organosphate sheet dip	
50	Land treatment with pig or poultry carcass ash for benefit to	All
51	Anaerobic digestion	

Table 13. Number of data returns received for complex exemptions 2017 - 2021

Year	Number of complex exempt activities	Returns Received	Total return rate	Total waste inputs (million tonnes)
2017	**1075**	687	64%	2.99
2018	**1047**	647	62%	3.12
2019	**1051**	578	55%	2.02
2020	**958**	324	34%	1.76
2021	**639**	458	72%	1.93

Scottish accredited packaging waste reprocessors

Scottish reprocessors of packaging waste can register with SEPA to become an accredited reprocessor[19]. Accredited businesses can issue and sell evidence of recycling and recovery to directly registered obligated producers and packaging compliance schemes.

The number of reprocessors applying for accreditation in Scotland in any given year varies by a relatively small amount. There is a significant financial incentive to register larger businesses. For smaller businesses the extra administration costs under the accreditation scheme means they may choose not to register on the scheme if tonnage and/or prices become too low.

UK packaging waste recycled by Scottish reprocessors (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 reprocessors 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. Only audited data has been used for recycling data.

An accredited reprocessor 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.

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

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. In 2021 the directory identified about 35 sites that can recycle waste into aggregates which meet the terms of the aggregates protocol and have ceased to be waste.

SEPA surveyed sites taken from the Aggregates Quality Protocol Supplier Directory and asked them to provide the quantity of aggregate precursor waste that came onto their site(s) in 2021, the quantity of waste that was rejected (disposed) after treatment, and the quantity of aggregate product manufactured at their site, classified using industry standards, and to (optionally) tell us how much product was sold. Operators were asked to indicate the regulatory regime for the section of the site that the waste was processed - a simple waste exemption, a complex waste exemption, or a waste management licence. There was a 26% response rate to the survey (9 responses from 35 operators surveyed). Of the remaining operators, two sites were permanently shut, and two sites that did not submit a return indicated that they no longer operate under a simple exemption, with all data being submitted by a licensed site return. A summary of responses and tonnages received in returns is depicted in Table 14 below. The low return rate and tonnages received in 2021 may be an effect of COVID-19 lockdown and other restrictions. However, it is also thought there is a Scotland wide trend to move the processing of these wastes to larger, licensed C&D recycling plants.

Only waste processed under a simple exemption from the aggregates datasets was included in the waste data tables to avoid double counting with waste from the licensed site and complex exemption datasets. A separate method is used to estimate aggregate produced at sites operating under a waste management licence (see section 4.7 on page 30).

Table 14. Aggregate produced from waste at simple exempt sites 2012 - 2021

Year	Number of simple exempt activities	Returns Received	Total return rate	Total waste inputs (million tonnes)
2013	*Not available*			364,000
2014	*Not available*			641,000
2015	*Not available*			519,000
2016	**1047**	647	62%	417,000
2017	**1051**	578	55%	439,000
2021	**639**	458	72%	77,000

Transfrontier Shipment of Waste (TFS) Database

Waste that is imported to or exported from the UK is subject to regulatory controls. There are two types of controls:

- Notifiable wastes (NW): These are typically wastes with hazardous properties, and which can only be exported subject to pre-notification to the regulator and payment of a fee;
- Annex III wastes (commonly known as "Green list wastes" or GLW). These are non-hazardous wastes which do not require pre-notification or a fee to be exported.

Refuse derived fuel, as a NW is subject to pre-approval with data on shipments provided to SEPA. The data used for 2011 – 2018 was obtained from relevant SEPA foi disclosure logs. The 2021 data was obtained internally from SEPA's TFS team.

Appendix 2

Table 15. Conversions from operator type to SIC group used in the C&I waste generated methodology[20]

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

[20] 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
10 01	Power stations	All	Power industry
10 02 to 10 14	Manufacturing	All	Other manufacturing
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 waste[3]	Commerce
15 01	Packaging	For non-local authority waste[4]	51% industry (SIC A-E) 49% commerce[6]
15 01	Packaging	Local authority waste or site[1]	Household
15 01	Packaging	Local authority waste or site[2]	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 site[1]	Household
16 01	ELVs	Local authority waste or site[2]	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]

EWC chapter or code	Material or activity	Origin of waste	Sector assumption
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 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	Household

EWC chapter or code	Material or activity	Origin of waste	Sector assumption
		waste or site[1]	
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
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]

EWC chapter or code	Material or activity	Origin of waste	Sector assumption
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 (C)	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 (SIC A - E) 49% commerce	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 for waste types 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 2021. For example, Percentage B was applied for used oils. This means that the total quantity of oil waste generated in 2021 was apportioned across the industry (economic) sectors in accordance with the percentage split from the 2010 data.

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[21], the Wales C&I survey 2009[22] and the Scotland C&I data 2011[23]. SIC A-E refers to all industrial sectors excluding construction.

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

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

[23] 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	25% of 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
Combustion wastes	Incinerator bottom ash	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
Health care and biological wastes	Adsorbent Hygiene Products (AHP)	NH
Household and similar wastes	Furniture	NH
Household and similar wastes	Bric-a-brac	NH
Household and similar wastes	Mattresses	NH

SEPA reporting	WasteDataFlow	Hazardous (H) / non-hazardous (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 materials	Cardboard beverage packaging	NH
Mixed and undifferentiated materials	Co-mingled materials	NH
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

SEPA reporting	WasteDataFlow	Hazardous (H) / non-hazardous (NH)
Rubber wastes	Van tyres	NH
Rubber wastes	Large vehicle tyres	NH
Rubber wastes	Mixed tyres	NH
Soils	Soil	NH
Textile wastes	Textiles only	
Textile wastes	Footwear only	
Textile wastes	Textiles and footwear	NH
Textile wastes	Carpets	NH
Used oils	Mineral oil	H
Vegetal wastes	Green garden waste only	NH
Vegetal wastes	Other compostable waste	NH
Vegetal wastes	75% of Mixed garden and food 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	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 collected	H

Appendix 5

EWC codes which comprise Municipal Waste and biodegradability factors

EWC code	Biodegradability factor	EWC code	Biodegradability factor
20 01 01	1	20 03 99	0.63
20 01 02	0	19 01 02	0
20 01 08	1	19 01 11*	0
20 01 10	0.5	19 01 12	0
20 01 11	0.5	19 01 13*	0
20 01 13*	0	19 01 14	0
20 01 14*	0	19 01 15*	0
20 01 15*	0	19 01 16	0
20 01 17*	0	19 01 17*	0
20 01 19*	0	19 01 18	0
20 01 21*	0	19 01 99	0
20 01 23*	0	19 04 01	0
20 01 25	1	19 04 02*	0
20 01 26*	1	19 04 03*	0
20 01 27*	0	19 04 04	0
20 01 28	0	19 05 01	0.63
20 01 29*	0	19 05 03	0.63
20 01 30	0	19 06 03	0
20 01 31*	0	19 06 04	0.2
20 01 32	0	19 06 05	0
20 01 33*	0	19 06 06	0.2
20 01 34	0	19 12 01	1
20 01 35*	0	19 12 02	0
20 01 36	0	19 12 03	0
20 01 37*	1	19 12 04	0
20 01 38	1	19 12 05	0
20 01 39	0	19 12 06*	1
20 01 40	0	19 12 07	1
20 01 41	0	19 12 08	0.5
20 01 99	0.63	19 12 09	0
20 02 01	1	19 12 10	0.5
20 02 02	0	19 12 11*	0.5
20 02 03	0	19 12 12	0.63
20 03 01	0.63	15 01 01	1
20 03 02	0.63	15 01 02	0
20 03 03	0.51	15 01 05	0.74
20 03 04	0.2	15 01 06	0.63
20 03 06	0.1	15 01 07	0
20 03 07	0.5	15 01 09	0.5

Appendix 6

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 2000 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 7

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 8

Acronyms

AD	Anaerobic Digestion
C&D	Construction and Demolition
C&I	Commercial and Industrial
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
MRF	Materials Recovery Facility
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
TFS	Transfrontier shipment of waste
WFAS	Waste From All Sources
WDF	WasteDataFlow
WEEE	Waste Electrical and Electronic Equipment

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