Scottish Environment Protection Agency
Buidheann Dìon Àrainneachd na h-Alba

For the future of our environment

2022 WASTE DATA QUALITY REPORT

WASTE LANDFILLED IN SCOTLAND

October 2023

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Introduction

This report describes the methodologies to produce summary data on waste landfilled in Scotland for the 2022 calendar year. The report should be used alongside the 2022 Waste landfilled in Scotland official statistics commentary document and associated data tables.

The 2022 data are presented as follows:

- The Waste landfilled in Scotland and associated 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: www.sepa.org.uk/environment/waste/waste-data/waste-data-reporting/waste-data-for-scotland/.

- Scotland's Environment Waste Discover Data tool presents the waste from all sources (WFAS) data in an interactive and visual format and is found on Scotland's Environment web at www.environment.scotland.gov.uk/get-interactive/data/waste-from-all-sources/. This tool covers the total waste managed, whether it be waste from households, waste from construction and demolition, or waste from commerce and industry. It includes the landfill dataset.

  The WFAS Discover tool is updated once yearly, in about March, when all data for Scottish waste generated and managed, of which waste incinerated in Scotland is a subset, becomes available. The statistical release and excel incineration data tables are released about six months before the annual update of the WFAS Discover tool. This is because the incineration data comes primarily from one discrete dataset and, in line with the code of practice for statistics which provides that statistics should be released as soon as they are considered ready, can be prepared and published earlier than the WFAS.

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)

Appendix 1 provides a fuller description of the dataset(s) listed above, including any links to return forms and guidance.

Appendix 2 provides a summary of the coding of waste using the European Waste Catalogue (EWC) and European Waste Catalogue for Statistics (EWC-STAT), which are used throughout this document.

Appendix 3 provides a table of EWC codes that comprise municipal waste, for the purpose of reporting BMW landfilled.

Appendix 3 provides a glossary of terms.

Appendix 4 provides a list of acronyms.

Revisions Policy

Revisions could occur for various reasons, including when data from third parties are 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 is revised for all years to ensure that comparisons between years are valid.

Progress against targets

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 plan. Some of these targets are derived from EU directives such as the Waste Framework Directive. A summary of the targets related to the landfilling of waste in Scotland are provided in Table 1 below.

In 2012, the Scottish Parliament passed the Waste (Scotland) Regulations 2012[1], which included a ban on biodegradable municipal waste (BMW) being disposed to landfill[2]. The ban is planned to be implement from 2025.

Table 1 Scottish Government Policy Targets related to landfilling of waste in Scotland

TARGET	YEAR	SET BY
No more than 1.26 million tonnes of biodegradable municipal waste to be sent to landfill	2020	EU
No more than 5% of all waste to go to landfill	2025	Scottish Government
No biodegradable municipal? waste disposed to landfill	2025	Scottish Government

[1] https://www.legislation.gov.uk/ssi/2012/148/contents/made

[2] The 2025 BMW landfill ban measures differs from the BMW landfilled as reported in the statistical publication. The BMW ban applies to the whole amount of waste containing BMW, not just the BMW fraction landfilled.

Waste Landfilled in Scotland

Introduction

This section describes how we report the disposal of wastes via landfill.

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

Waste disposed via landfill

Data on waste disposed to landfill in Scotland were taken from the licensed/permitted site returns dataset.

All landfill data is taken from permitted waste quarterly landfill data returns submitted to SEPA. There were 40 Scottish landfill sites included in the analysis for 2022. The number of landfill sites that are actively disposing of waste to landfill varies from year to year. Table 2 below shows the number of active landfill sites that have contributed to the landfill data from 2005 to 2022. The number of landfill sites has decreased steadily between 2005 and 2022, consistent with a decrease in waste landfilled from 7.1 million tonnes in 2005 to 2.4 million tonnes in 2022.

Returns were checked for completeness, along with the correct use of ‘landfill’ as a management method in Tables B and C4, and consistency with previous site returns.

The data for waste landfilled in Scotland was taken from Tables B (Waste inputs to site) and C4 (Waste landfilled or incinerated after treatment on-site – landfill or incineration sites only) in the licensed/permitted site returns, with the management method of ‘landfill’. Information from Table B on the origin of waste was used to split data into Scottish and non-Scottish waste landfilled in Scotland.

Table 2. The number of landfill sites in Scotland that have contributed to the landfill dataset

YEAR	NUMBER OF LANDFILL SITES
2005	129
2006	117
2007	110
2008	83
2009	81
2010	74
2011	66
2012	65
2013	68
2014	70
2015	62
2016	57
2017	55
2018	49
2019	45
2020	41
2021	43
2022	40

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 ("BMW factor") has been determined for all waste types sent to landfill, ranging from 100% for materials such as paper and food, 50% for materials such as textiles and furniture, and 0% for inert materials like tyres and metals. These factors were

originally devised via a working group between Defra and the devolved regions of the UK for the purpose of reporting BMW sent to landfill under the EU landfill directive (Council Directive 1999/31/EC). Although no longer reporting to the EU under this directive, the BMW sent from landfill is routinely published by Defra in its UK Statistics on Waste.

It should be noted that this measure differs from that for the 2025 BMW landfill ban in Scotland. The 2025 landfill ban applies to the whole amount of waste containing BMW, not just the BMW fraction. For example, 100 tonnes of 20 03 01 coded waste, which has a biodegradability factor of 63%, will contribute 63 tonnes of BMW landfilled for the 2020 BMW landfill target. However, the 2025 landfill ban for municipal BMW will apply to the entire 100 tonnes of this waste.

For all waste landfilled the BMW factor was applied to the tonnes of waste for each EWC code. This gives the total biodegradable waste landfilled by waste type. This was undertaken for all waste codes that fall into the category of Municipal waste, being 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. The full list of EWC codes which comprise the definition of municipal waste is listed in Appendix 2.

EWC Coded 19 12 12 waste

EWC coded 19 12 12 wastes, residues from the sorting of waste, may be produced from municipal waste sources, for example, sorting of mixed residual waste to pick out recycling material; or from non-municipal waste sources, for example, sorting of construction waste for forward recycling. A methodology is therefore required to estimate the amount of 19 12 12 waste that is produced from municipal sources.

The amount of municipal waste that contributed to the EWC coded 19 12 12 sorting residues landfilled was estimated from the proportion of net municipal waste and net non-municipal waste inputs from sites across Scotland that produced the sorting residue wastes (see Table 3 below).

To do this, the following approach was used:

- The 19 12 12 “produced” at Scottish waste sites from municipal waste (MW) sources was estimated from waste data returns submitted by the population of Scottish waste sites.

- The MW inputs and non-MW inputs were summated across the population of waste sites that recorded EWC coded 19 12 12 wastes sent off site. Only inputs that were recorded as brought onto site specifically for waste treatment were included in the analysis. A ratio of MW inputs to non-MW inputs was determined from this summary.

- For each waste site, net 19 12 12 inputs (outputs minus inputs) were recorded, subtracting any outputs sent outwith Scotland, and any outputs recorded as sent to incineration (as these were not landfilled). If a negative number resulted, it was assumed zero tonnes of 19 12 12 waste was produced at the site.

- The net 19 12 12 produced was summated across all waste management sites, then multiplied by the ratio of MW inputs to provide an estimate of 19 12 12 produced from MW and 19 12 12 produced from non-MW.

- The percentage of 19 12 12 produced from MW sources over non-MW sources (see Table 3 below) was applied to the 19 12 12 waste recorded as landfilled for the year.

For 2019 and 2020, where there was an incomplete dataset following a cyber-attack on SEPA in December 2020, the ratio of MW inputs over non-MW outputs was based on the average of 2017 – 2018 and 2021. For 2019, a summary of Scottish waste landfilled by EWC code was recovered following the cyber-attack and the BMW could be calculated by applying the ratio on the EWC codes. For 2020, although the full set of Scottish data returns was not available, the subset of landfill returns was available in which to apply the ratio.

Table 3. Estimation of 19 12 12 produced from muncipal waste

YEAR	19 12 12 PRODUCED FROM MW SOURCES (TONNES)	19 12 12 PRODUCED FROM NON-MW SOURCES (TONNES)	PERCENTAGE 19 12 12 PRODUCED FROM MW SOURCES
2007	194,542	247,984	44.00%
2008	300,324	296,978	50.30%
2009	189,902	260,215	42.20%
2010	257,683	179,434	59.00%
2011	261,829	210,512	55.40%
2012	403,649	186,297	68.40%
2013	375,847	243,365	60.70%
2014	380,309	257,037	59.70%
2015	447,206	274,389	62.00%
2016	499,296	243,209	67.20%
2017	505,329	289,163	63.60%
2018	553,274	329,805	62.70%
2019	245,663	193,576	65.60%
2020	219,273	22,507	65.60%
2021	855,053	358,125	70.50%
2022	534,976	360,356	59.80%

Note: due to unavailability of data, 2019 and 2020 percentages are based on the average of 2017 - 2018, and 2021

Appendix 1

Datasets used in the 20221 methodology

Scottish licensed/permitted site returns

Approximately 940 individual licences submit quarterly returns to SEPA via email or post, of which 40 sites were operational landfill sites. A copy of the return form can be downloaded from the SEPA website[3]. The returns dataset is managed and checked by SEPA. The return form consists of Table B (Waste inputs to site), Table C (Waste treated on site), Table C4 (Waste landfilled or incinerated after treatment on-site – landfill or incineration sites only) and Table D (Waste sent off site).

SEPA carried out quality assurance of the dataset that included comparing individual site data with previous quarters/years, consistency of EWC codes with the description of waste provided by the operator and missing data. Submissions were collected, uploaded and checked by SEPA staff with the assistance of various automation and visual tools throughout the process.

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

Appendix 2

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) as amended in 2015 (2014/955/EU). The list is used to categorise wastes based on a combination of what they are, and the process or activity that produces them.

The full EWC 2000 list (as amended) and further information is available here:

https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014D0955

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 sub-chapters and are assigned a six-digit code that comprises two digits for the chapter, two for the sub-chapter and two to the waste type.

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

The use of EWC codes to describe waste on waste transfer notes in Scotland has been statutory since April 2004. Most 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 (as amended).

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 thirteen categories, each

represented by a two-digit code between 01 and 13. These are sub-divided into individual waste types.

A table of equivalence allows wastes coded in the EWC 2000 (as amended) to convert 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 2

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 3

Glossary

Biodegradable Municipal Waste (BMW) – the fraction of municipal waste that will rot or degrade biologically, such as parks and garden waste, food waste, timber, paper, and card. The biodegradable component of municipal waste is estimated using the biodegradable factors listed in Appendix 2.

EWC Code – a six-digit code listed in the European Waste Catalogue. These codes are used to identify and classify waste into different categories. They are structured as three pairs of numbers, each representing chapters, sub-chapters, and individual entries. For example, 12 01 06*.

Hazardous Waste – waste with hazardous properties which may render it harmful to human health or the environment. Hazardous waste is also called Special Waste in Scotland, as defined in the Special Waste Regulations 1996 [Latest available (Revised) version].

Municipal Waste – waste that is made up of household waste and commercial waste that is similar in nature to household waste. It is estimated as EWC Chapter 20 and selected wastes of EWC Chapter 19 and Chapter 15 wastes listed in Appendix 2.

Waste from all sources (WFAS) – waste that originates from commercial and industrial sources, construction and demolition sources as well as from household sources.

Waste landfilled – WFAS that is disposed of to landfill in Scotland.

Appendix 4

Acronyms

BMW	Biodegradable Municipal Waste
C&D	Construction and Demolition
C&I	Commercial and Industrial
EWC	European Waste Catalogue
EWC-STAT	European Waste Catalogue for Statistics
SEPA	Scottish Environment Protection Agency
WFAS	Waste From All Sources

Version Control

Version	Description	Date
1	Initial published report	23/10/2023

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