

UK RECYCLING AND WASTE TREATMENT MARKET OVERVIEW

July 2024



1. FOREWORD

Recycling and waste treatment is an essential public service upon which every one of the 67 million people living in the UK relies. In fact, with each one of us producing around 400kg of household-like waste every year, rubbish would quickly pile up without the daily efforts of 140,000 people employed across the recycling and waste treatment sector.

The only interaction most people have with our sector is when their home or business bins are collected, or they need to visit their local Household Waste Recycling Centre. However, behind these valuable frontline services lies a large, intricate and symbiotic network of organisations, infrastructure, data, policy and regulation that is forever shifting in response to societal and technological change.

The safe and sanitary management of waste has long been essential to protecting public health and the environment, but the sector also now plays a vital role in the circular economy – ensuring that a wide and growing range of materials are kept in productive use for as long as possible. Reducing the extraction of raw materials by putting waste to good use is critical, not only to sustainability and resource-efficiency, but also to efforts to reverse biodiversity loss and reduce carbon emissions.

Through our circular economy activities, the sector contributes significantly to decarbonisation across the economy through 50MtCo_{2e} in avoided emissions. However, these activities produce their own direct (Scope 1 and 2) emissions and, although the sector has reduced its GHG emissions by 46% since 1990, it still contributes 8% of UK carbon emissions (36MtCo_{2e}).

The ESA's Net-Zero strategy sets an ambitious but credible target for the recycling and waste treatment sector to reduce these emissions to net-zero by 2040 through efforts to increase recycling, decarbonise residual (un-recycled) waste treatment and move to zero-emissions vehicles.

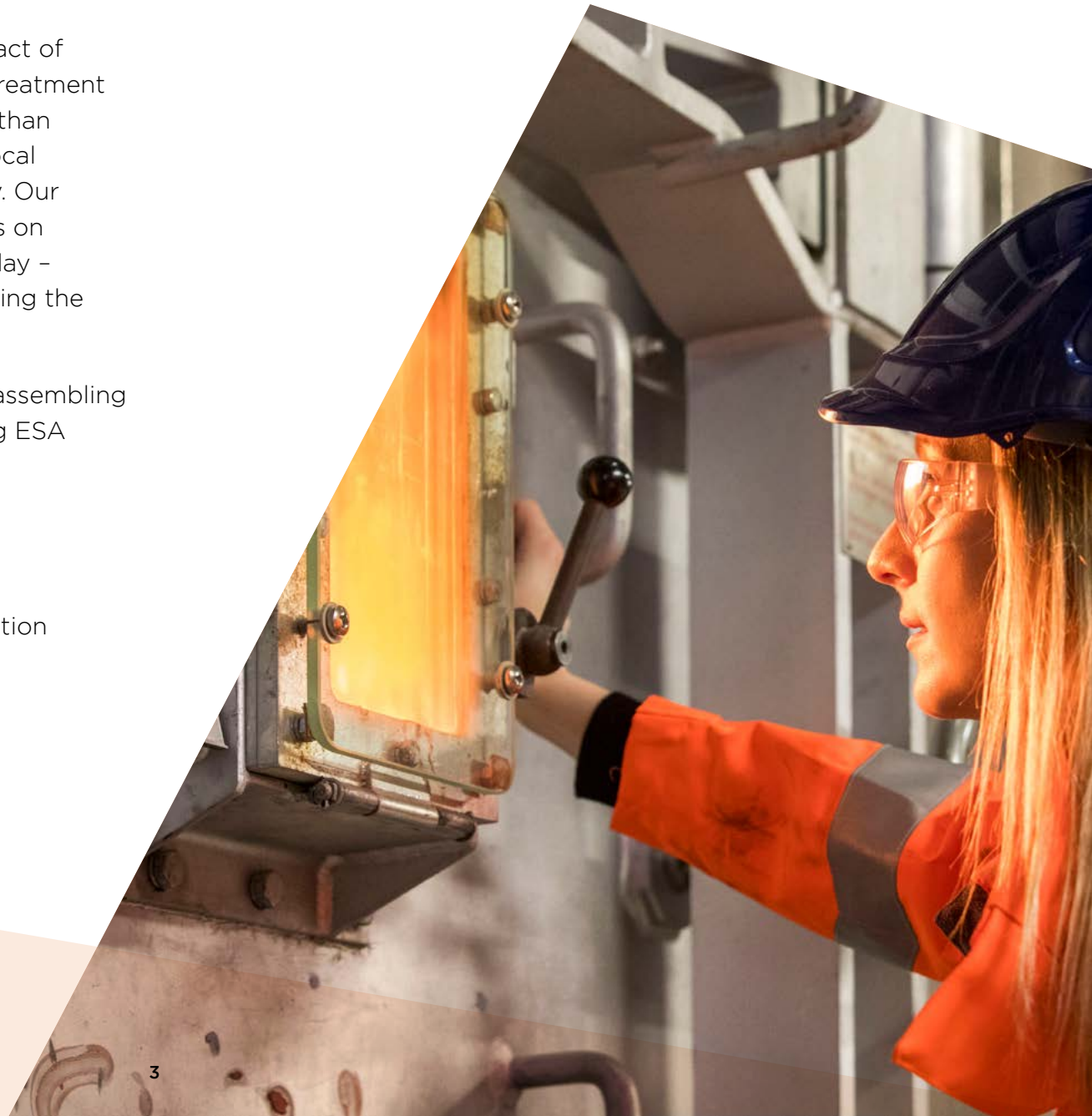
As the voice of the recycling and waste treatment sector, the Environmental Services Association (ESA) commissioned this report to provide, in one place, a snapshot of the UK's £24bn recycling and waste market. It brings together consistent, current, data for waste volumes and flows, alongside informative charts, breaking down the complex market structure, with commentary on current and future economic and policy drivers both for the sector's core activities and its decarbonisation plans. We hope that it will serve as an accessible overview for stakeholders, investors, policy-makers, journalists and, more widely, those with an interest in the UK's recycling and waste treatment sector.

This report also underscores the collective scale and impact of the ESA's members within the UK's recycling and waste treatment system, which together account for a workforce of more than 50,000 people and operate the majority of outsourced local authority recycling and waste services across the country. Our members invest billions in British infrastructure, put boots on the ground and serve more than 17 million people every day - playing a pivotal role in the circular economy and protecting the environment.

I would like to thank Tolvik Consulting Ltd for their work assembling this document and the numerous organisations (including ESA members) cited within this report.

Jacob Hayler

Executive Director of the Environmental Services Association



2. NOTES

A complete UK Recycling and Waste Treatment Market Overview report is free to members of the ESA and can be downloaded online from the ESA members area at www.esauk.org

This is an abridged version for all to view. Those who are not members of the ESA but who wish to access a full copy of this report should please contact t-waters@esauk.org

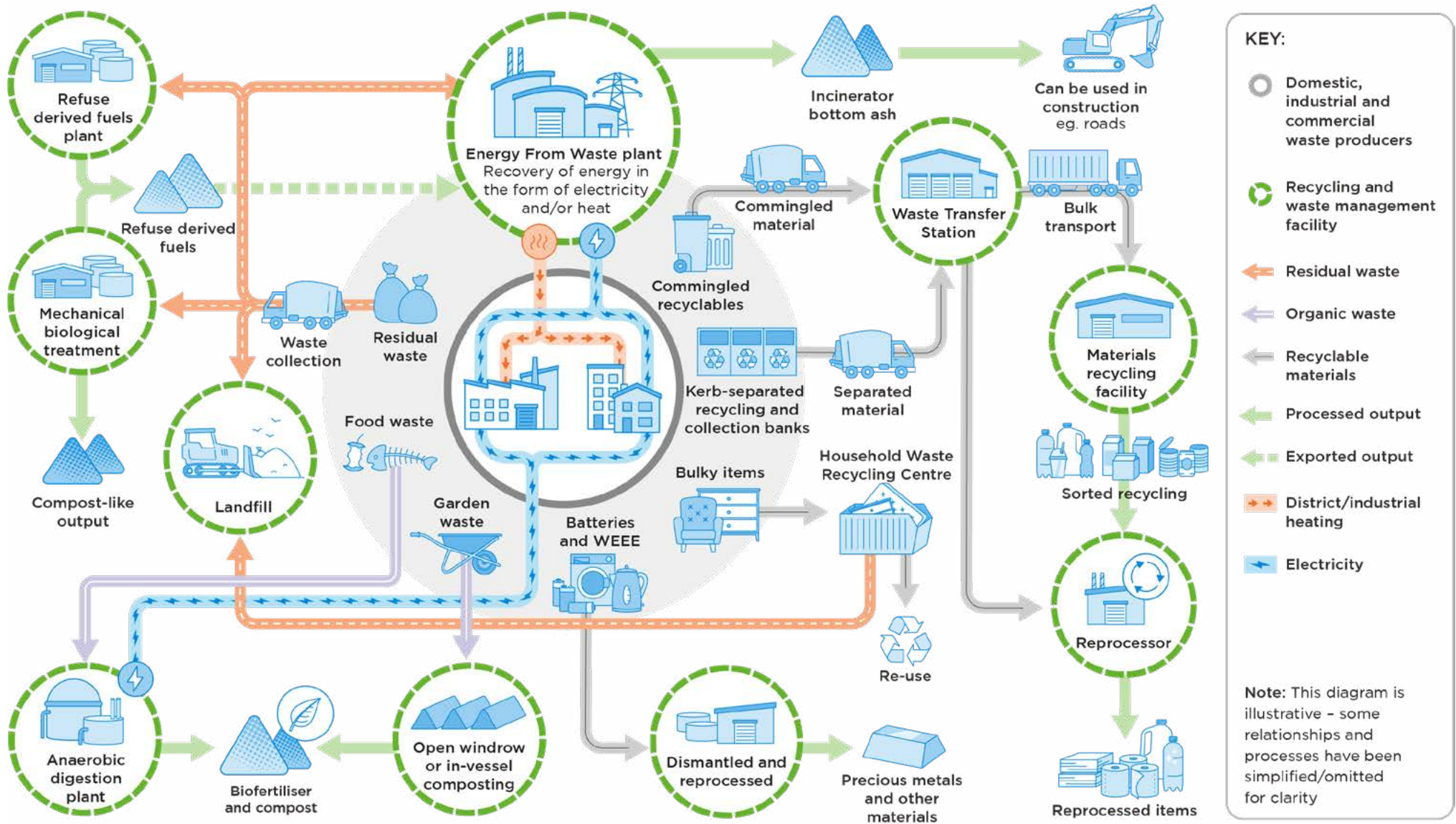
The ESA engaged Tolvik Consulting Ltd (Tolvik) to prepare this report. Tolvik is a specialist provider of independent market analysis and commercial advisory services to the waste and bioenergy sectors across the UK and Europe.

The ESA and Tolvik wish to thank PwC, 360 Environmental, Suez, Monksleigh, Anthesis and various trade associations for their input into this report. References are provided to specific publications and sources used.

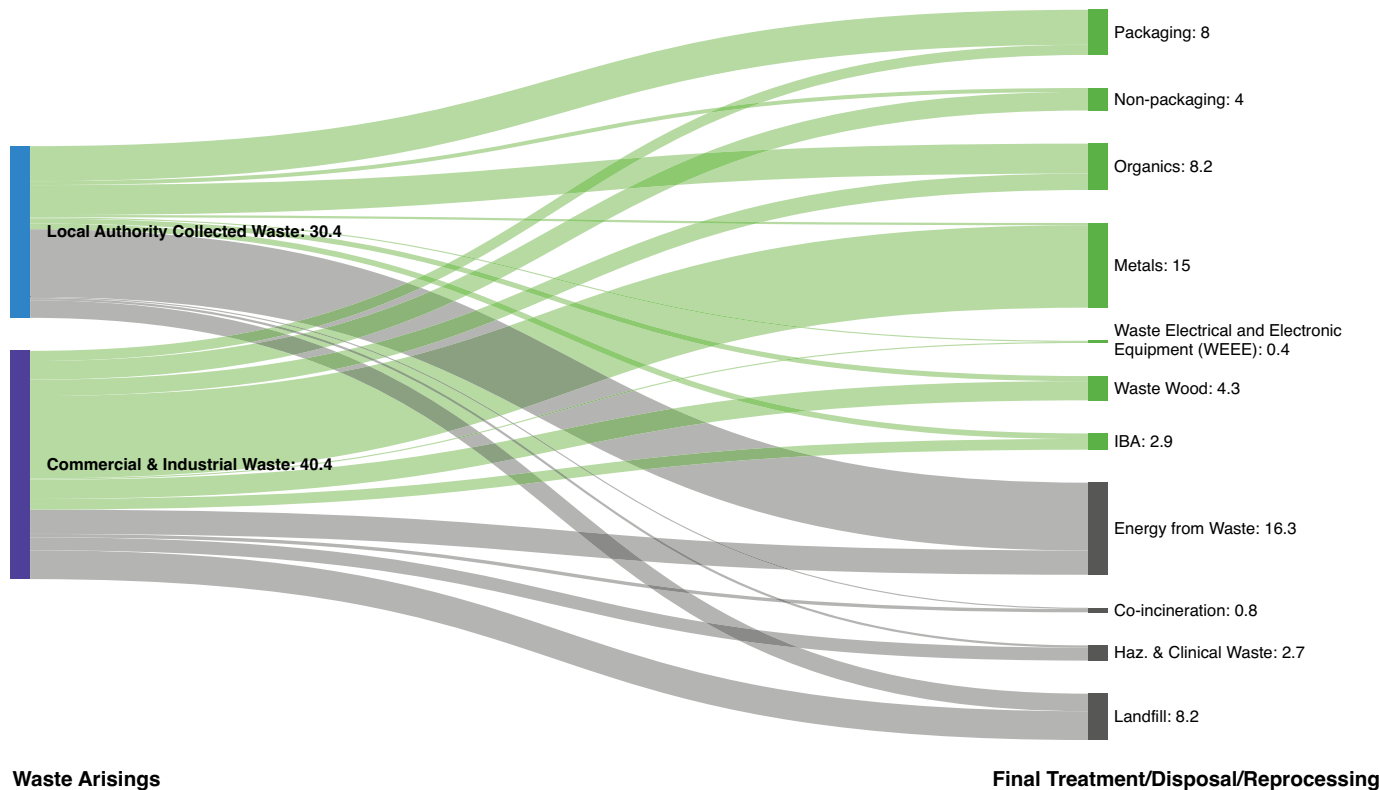
The timing of publications of official environmental data for the recycling and waste treatment sector varies considerably. For example, household waste and recycling data is generally published almost a year in arrears, whereas information regarding trade flows and some market pricing information is more regularly available, often monthly.

This report subsequently uses 2021 as its main baseline year, as this provides the most comprehensive dataset of local authority waste flows and waste processed through recycling and waste management facilities. Where more recent data is available, this is also included in the report and referenced accordingly.

3. SECTOR OVERVIEW



In 2021 it is estimated that 70.7 million tonnes (Mt) of a wide-range of waste types were collected in the United Kingdom, either as Local Authority Collected Waste (LACW) or from business premises as Commercial and Industrial Waste (C&I Waste). Figure 3.1 below provides a high-level overview showing the flow of tonnages from the point of collection to key final treatment, disposal and reprocessing destinations.



The total tonnage of LACW (30.3Mt) includes the UK Government’s preferred measure of ‘Waste from Households’ together with other wastes, such as street cleaning, household DIY waste, and some healthcare and hazardous wastes. However, it is important to note that, in this report, it specifically excludes C&I Waste volumes collected by local authorities, since this tonnage is included in the 40.4Mt of C&I Waste.

Figure 3.1: UK waste arisings and final treatment, disposal and reprocessing, Mt in 2021

Source: Defra’s UK Statistics on Waste¹, Tolvik analysis of other information sources, adjusted for Local Authority Collected C&I Waste

4. ECONOMIC ACTIVITY

In 2021 the total turnover of the recycling and waste treatment sector is estimated to have been £23.5bn.

Figure 4.1 provides an indicative breakdown of the value across key segments, including public sector expenditure, service charges and gate fees. However, some sub-sectors, such as recycling, are influenced significantly by fluctuating commodity values.

A separate assessment of the revenues of companies held by the Office of National Statistics (ONS) reporting under relevant Standard Industrial Classification (SIC) codes for the waste and recycling sector is shown in Figure 4.2.

Indicative value of waste and resources sector (£bn)

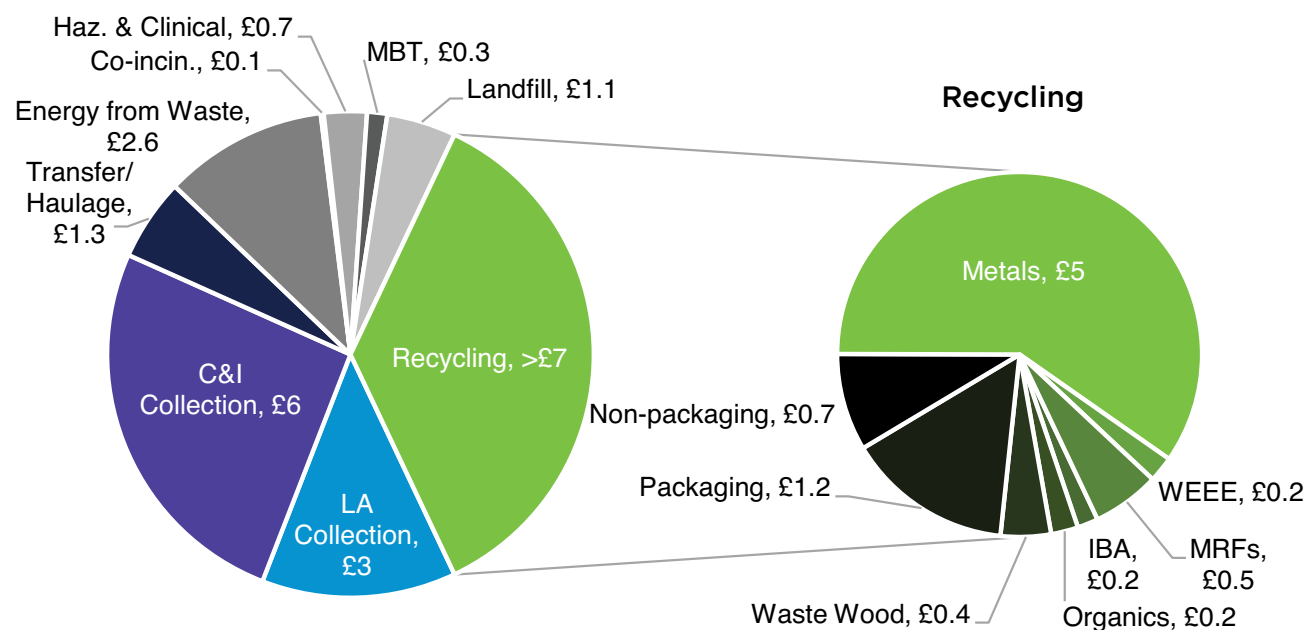


Figure 4.1: Indicative value of key waste and recycling segments in UK, total £23.5bn in 2021
 Source: Tolvik analysis

Turnover

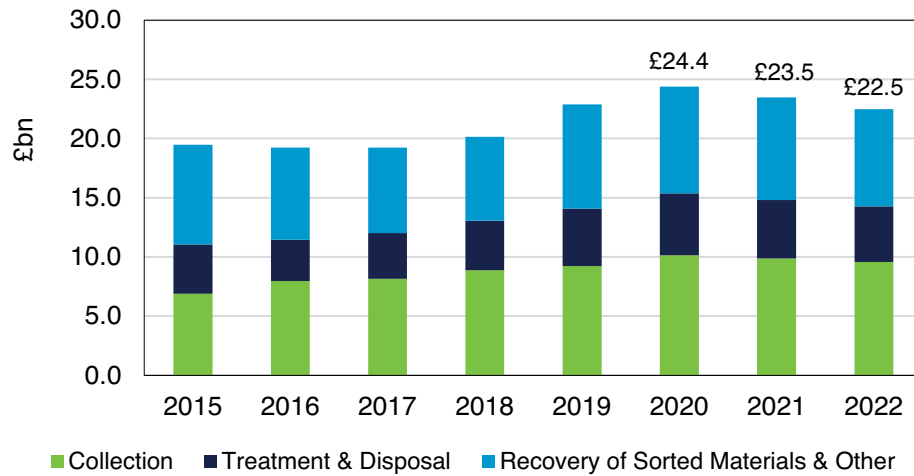


Figure 4.2: Revenues by relevant SIC codes 2015-2021

Source: Office of National Statistics (ONS)

The increased turnovers recorded in 2020 to 2022 above £23bn are likely to be a result of some increased tonnages of household waste during the COVID19 pandemic, as well as higher commodity markets for various recyclable materials and energy prices.

People, Business and Operational Sites

According to ONS there are 147,000 people employed in the collection, treatment and recovery/recycling of waste in the

Staff employed

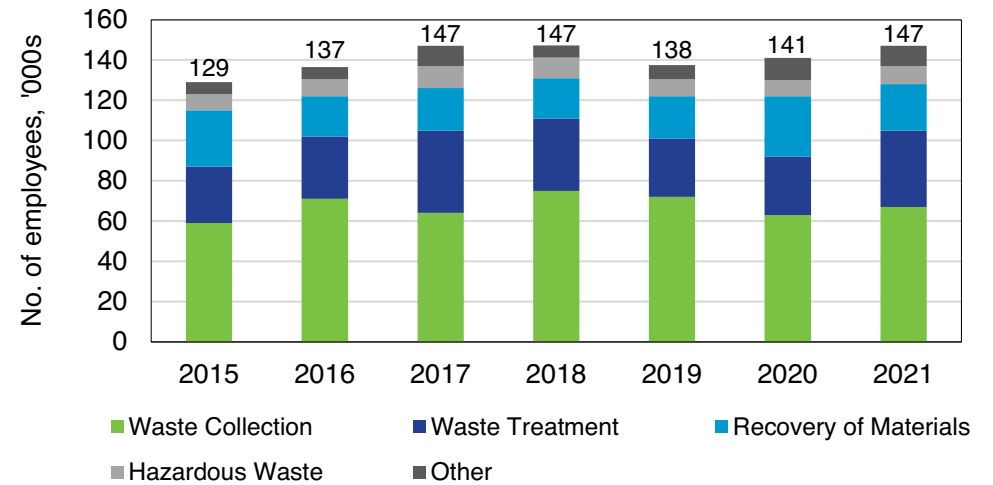


Figure 4.3: Staff employed in waste collection, treatment and recovery/recycling in UK

Source: ONS

UK, of which nearly 50% are recorded as being employed in the 'waste collection' category. Figure 4.3 suggests that overall sector employment has been relatively stable over recent years.

ONS data shows a gradual increase, since 2015, in the number of businesses in the sector to nearly 7,000 active enterprises by 2021, operating from just over 9,000 sites. This number of sites broadly correlates with Environment Permit information, subject to some uncertainty regarding how c1,000 HWRCs are allocated.

Sites and businesses

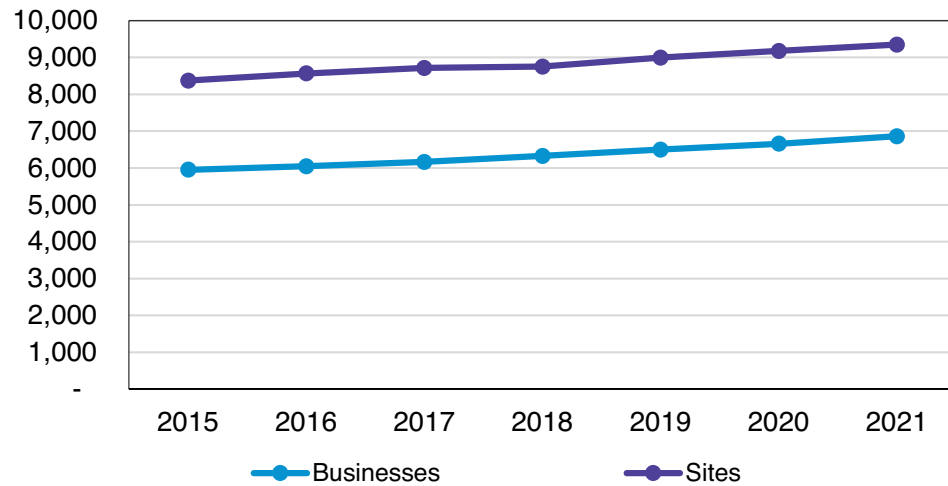


Figure 4.4: Sites and businesses in waste collection, treatment and recovery/recycling in the UK

Source: ONS

Market Participants

PwC supported the preparation of this report by analysing various public information sources to provide an overview, for the most recent year that data is available, of the larger waste management and recycling companies active in the sector. To this, Tolvik has provided estimates of the total tonnages of waste handled and number of staff employed by each organisation.

Members of the ESA in the following table are denoted by an asterisk. The ESA's largest 15 members have a combined annual UK turnover of more than £7.1bn and employ almost 47,000 people. As the next section shows, around 40% of local authority waste collection services are outsourced and ESA members Biffa, Veolia, SUEZ and FCC operate the majority of these outsourced services between them.

In addition to those larger members listed, the ESA also represents dozens of other recycling and waste treatment companies and associate members. A full directory of ESA members is available online at www.esauk.org



| GROUP | CORE ACTIVITIES | UK TURNOVER | TONNES HANDLED | UK STAFF |
|-----------------|---|-------------|----------------|----------|
| Beauparc* | Waste management and recycling services | £200m | ~3.5Mt | 2.8k |
| Biffa* | Integrated waste services provider | £1.6bn | 8Mt | 10.8k |
| Cory* | EfW and recycling services | £190m | 1.2Mt | 367 |
| EMR* | Metal recycling | UK n/a | >4.5Mt | 1.9k |
| Encyclis* | EfW operations | £160m | ~1Mt | 165 |
| Enfinium* | EfW operations | £300m | 2Mt | 238 |
| Enovert* | Landfill | £110m | 2Mt | 134 |
| Enva* | Haz. & non-haz. waste collection, recycling and treatment | £300m | >2Mt | 1.6k |
| FCC Recycling*† | Integrated waste services provider | £500m | ~9Mt | 4k |
| Grundon* | Haz. & non-haz. waste collection, recycling and treatment | £230m | 1.3Mt | 1k |
| Hills* | Integrated waste services provider | £125m | <1Mt | 180 |
| HW Martin | Waste services and transport support | £220m | <1Mt | 253 |
| MVV | EfW operations | £115m | >0.5Mt | 150 |
| Reconomy | Outsourced waste management | £220m | ~3Mt | 453 |
| S Norton | Metal recycling | £500m | 1.5Mt | 238 |
| Sims | Metal recycling | £1.4bn | >2Mt | 668 |
| Suez * | Integrated waste services provider | £900m | ~10Mt | 5.7k |
| Tradebe * | Hazardous waste management | £130m | >100kt | 860 |
| Veolia * | Integrated waste services provider | £1.7bn | ~11Mt | 14k |
| Viridor * | EfW and plastics | £700m | 3Mt | 3k |

Figure 4.5: Larger companies involved in waste collection, treatment and recovery/recycling,

*ESA Member

† FCC figures reflect FCC acquisition of Urbaser in 2023

Source: PwC, Tolvik, company information

5. ROLE OF THE PUBLIC SECTOR

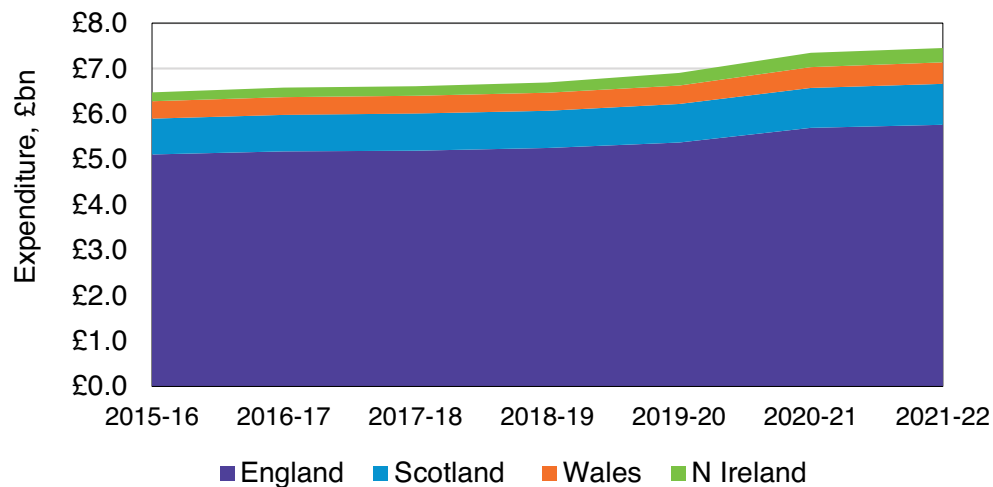
Local authorities play a critical role in the waste and recycling sector, with household waste making up circa 43% of total tonnages. This section considers the role of private sector companies in the collection of household waste.

Figure 5.1 provides the profile of local authority expenditure on waste and recycling services across all four countries, which is estimated to have increased to £7.4bn by 2021/22 according to analysis of Government spending figures.

This figure is substantially lower than the equivalent costs in the devolved administrations, all of which are estimated as having an average of over £300/tonne of waste collected.

Figure 5.1 shows that local authorities in England were responsible for 83% of the total Local Authority Collected Waste volumes across the four countries of the UK - incurring a total expenditure estimated to be £5.8bn (77% of the UK total), resulting in an average cost of £223/tonne of waste collected.

Cleansing, recycling and treatment services



| 2021/22 | EXPENDITURE, £BN | LOCAL AUTHORITY COLLECTED, MT | EXPENDITURE, £/TONNE |
|-----------|----------------------|-------------------------------|----------------------|
| England | £5.8bn (77%) | 25.9 (83%) | £223 |
| Scotland | £0.9bn (12%) | 3.0 (9%) | £307 |
| Wales | £0.5bn (6%) | 1.5 (5%) | £313 |
| N Ireland | £0.3bn (4%) | 1.0 (3%) | £310 |
| UK | £7.5bn (100%) | 31.4 (100%)* | £238 |

Figure 5.1: Local Authority Expenditure, *includes C&I by LAs Source: DLUHC², Welsh³ & Scottish⁴ Govt., Tolvik analysis

Figure 5.2 shows the breakdown of the total £5.8bn expenditure by service type in England as published by the Department of Levelling Up, Housing and Communities (DLUHC).

Local authority expenditure on environmental services, 2021/22 (£bn)

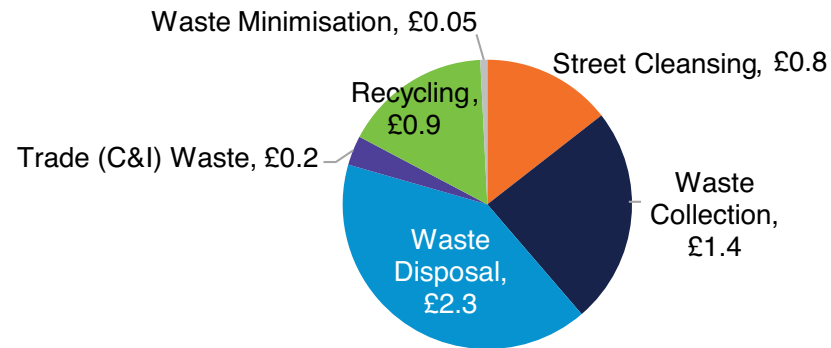


Figure 5.2: Local authority expenditure on waste services, England
Source: DLUHC

As shown in Figure 5.3 below, over the past decade, the tonnages of waste generated both as waste from households and C&I waste have been relatively stable.

UK Government – statistics on waste

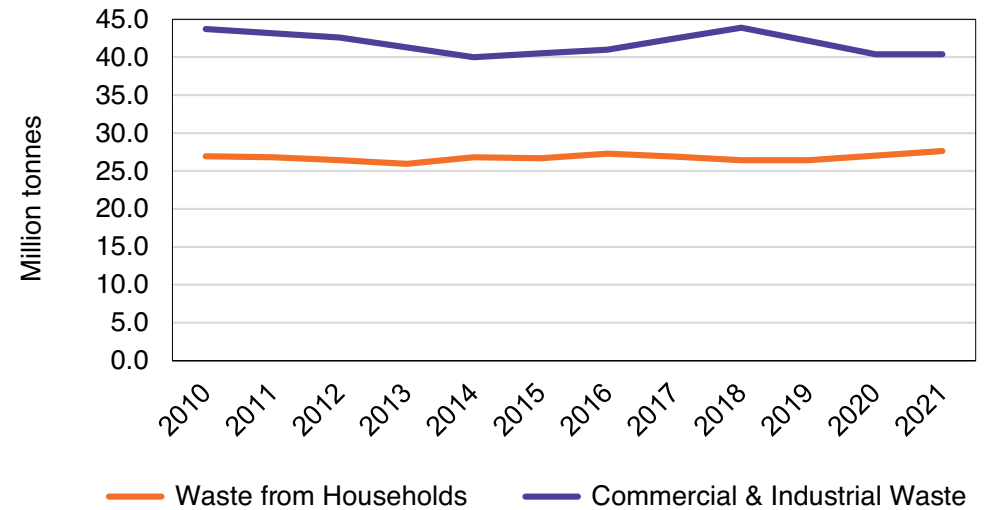


Figure 5.3: UK Government assessment of waste arisings (using waste from households)

Source: Defra, UK Statistics on Waste⁵

Household Waste Collection

Local authorities in the UK have a legal obligation to collect both recyclables and residual waste from households. Residual waste is defined as non-hazardous, solid, combustible mixed waste which remains after recycling activities. Where household waste is collected by a private sector contractor, the local authority retains responsibility for its collection.

Whilst collection in England is undertaken by a mix of contracts outsourced to private sector contractors and the public sector, almost all household waste collection services in Wales, Scotland and Northern Ireland are provided by the public sector.

Household waste collection

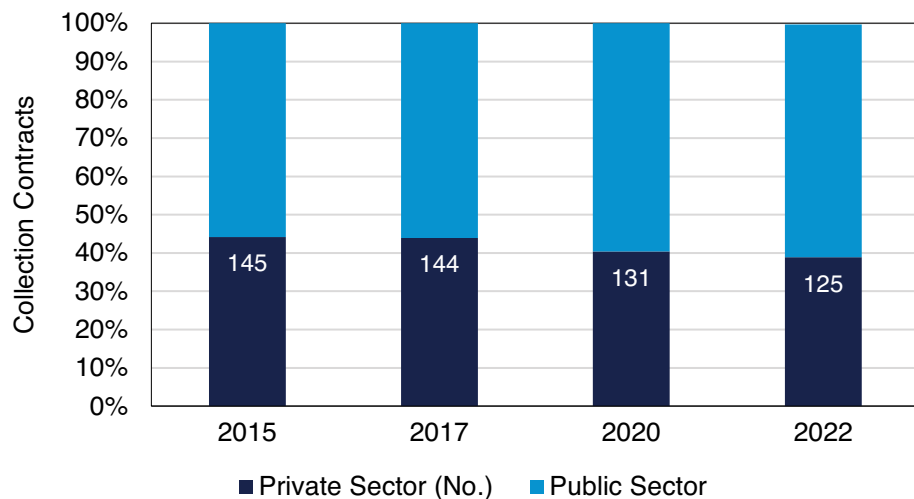


Figure 5.4: Private sector share of household collection contracts, England
 Source: Tolvik Analysis of BDS Data

Figure 5.4 relates to 320 local authorities in England only. It shows that the public sector, either directly or through a local authority trading company, is also the largest collector of household waste in England. This data suggests that public sector share of the household waste market has slightly increased over recent years.

Figure 5.5 is based on the number of collection contracts. Alternative analysis of the market based on the total tonnage of household waste collected and/or number of households serviced, yield very consistent results.

Outsourced household waste contracts

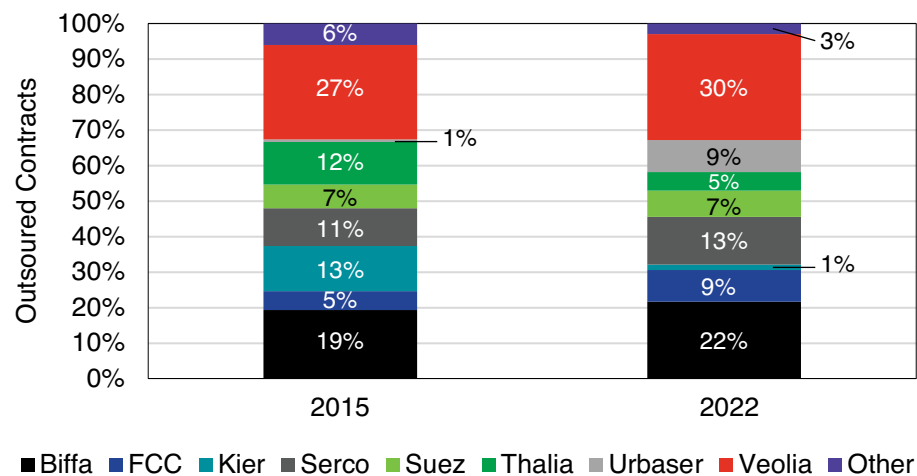


Figure 5.5: Outsourced residual household collection contractors, England
 Source: Tolvik Analysis of BDS Data

ESA expects that the six largest private sector collection contractors may regain some market share as a result of the implementation of the Simpler Recycling element of the Government’s Resources and Waste Strategy (RWS). This may require service re-design and collection-round restructuring, which may be outsourced to the private sector.

Household recycling rates in excess of 50% are regularly being achieved in some parts of the UK although the UK average has largely plateaued at circa 45% since 2014 under current market and policy conditions, as shown in Figure 5.6. Through its Resources and Waste Strategy, Government has announced significant reforms to recycling and waste treatment services, while setting a target to achieve an average municipal recycling rate of 65% by 2035, alongside other targets and drivers discussed in the full version of this report.

Household recycling rates

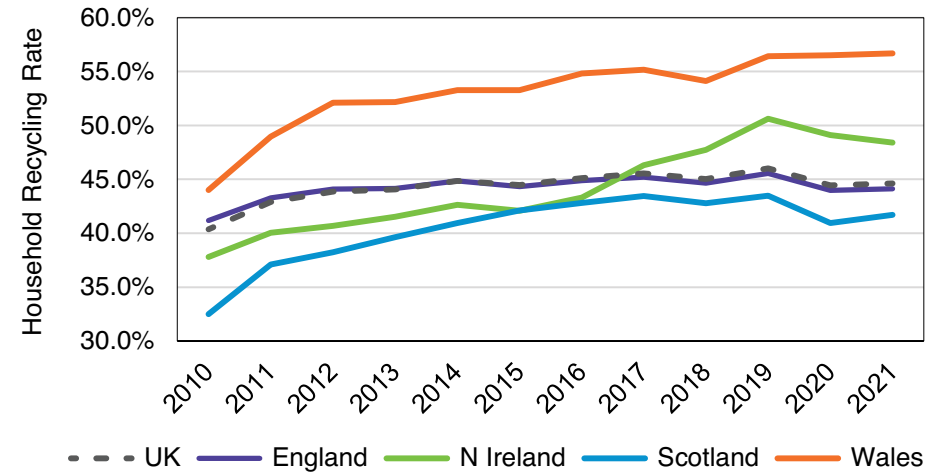


Figure 5.6: Household recycling rates

Source: Defra⁶



6. RECYCLING

Material Recycling Facilities (MRFs)

Across the UK recycling and waste sector there are a wide range of facilities described as MRFs which deploy a range of processes to sort and process recyclable waste for market. These include small-scale facilities processing highly-specialised recyclable streams, through to large scale facilities processing a mix of dry recyclables from households, C&I Waste sources and the construction and demolition sector.

Recently Monksleigh⁷ published a comprehensive report on those MRFs that predominantly handle typical dry recyclables such as paper/card, glass, plastics and metal cans. These ‘qualifying’ MRFs are required to report under the Environmental Permitting (England and Wales) Regulations 2016 and so there is a robust data set for the market. Some key findings of the Monksleigh report for 2021 include:

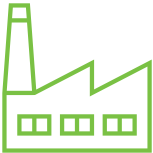


|  |  |  |
|--|---|--|
| <p>108 MRFs in Great Britain.</p> <p>50% of MRFs handled 50-125kt, 4 MRFs handled >125kt.</p> <p>4.2Mt of qualifying materials received, of which 84% in England.</p> <p>Biffa largest MRF operator with 18% share.</p> | <p>Inputs stable at GB level with sites in England increasing inputs by 0.3Mt since 2017.</p> <p>Further growth expected of 0.5Mt under <i>Simpler Recycling</i> regime.</p> <p>Outputs for reprocessing included 1.4Mt of paper & card, 1Mt of glass, 0.5Mt of plastics and 0.2Mt of metals.</p> | <p>Financial trends included increasing gate fees, increased sharing of commodity risks with local authorities/waste suppliers.</p> <p>Capital investments of ~£200m required to upgrade existing sites, however, delays to policy-making is impacting deployment.</p> <p>>150k material samples are undertaken annually at substantial cost, which are likely to double under new guidance</p> |

Figure 6.1: MRF market overview, GB

Source: Monksleigh⁸

The Monksleigh report shows a declining tonnage of paper/card processed at MRFs (reflecting changes in collection arrangements, with increased source segregated/twin stream household collections), volatile tonnages of glass (particularly over the pandemic period), and increased plastic and metal packaging recovered from MRFs – shown in Figure 6.2 below.

Qualifying MRF market inputs and outputs

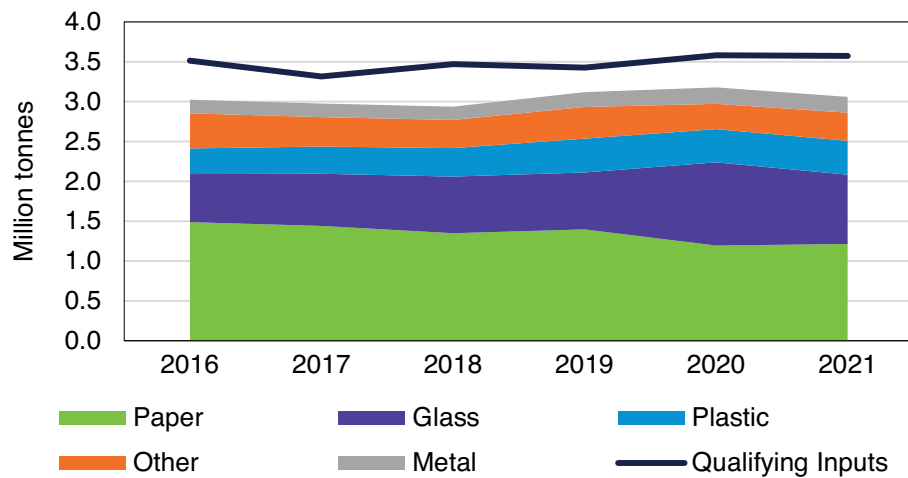


Figure 6.2: Qualifying MRF market inputs and outputs, England

Source: Monksleigh

Recycling of Packaging Waste

The UK has a statutory producer responsibility regime for packaging. This places a legal obligation on businesses which make or use packaging (like raw materials manufacturers, converters, packer/fillers and sellers) to ensure that a proportion of the packaging placed on the market is recovered and recycled. There is currently around 13Mt of packaging waste falling within the scope of the regime.

Recycling targets are material-specific and for 2022/23 ranged from 35% (wood) to over 80% (for paper, glass, and steel). Future recycling targets will be set as part of the Extended Producer Responsibility (EPR) policy process. A comprehensive and thorough explanation of the Packaging Waste regulations⁹ can be found at **360 Environmental**.

The total tonnage of packaging waste within the scope of the regulations recycled¹⁰ is now 8Mtpa, primarily comprising paper/ card, glass and plastics. UK Government reports material-specific and overall recycling rates (63%) on a regular basis for packaging sent for recycling derived both from households and commercial & industrial sources, as shown in Figure 6.3 below.

Packaging waste recycling

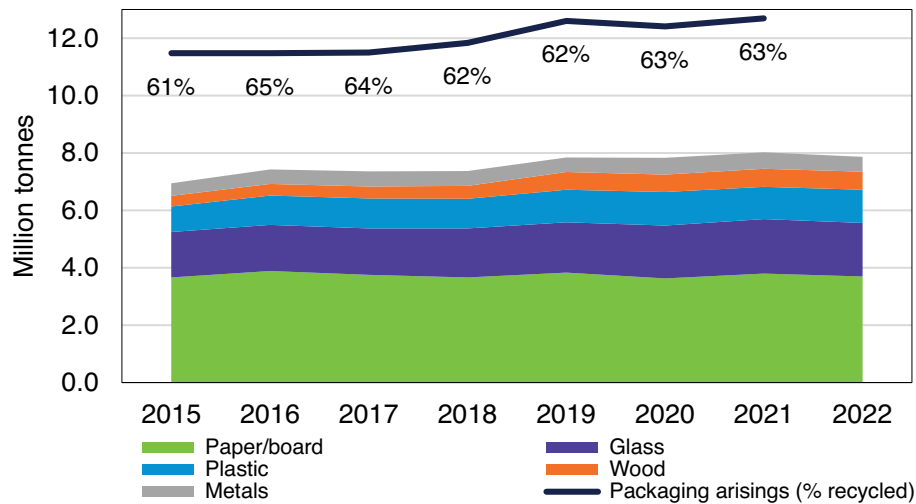


Figure 6.3: UK packaging waste recycling
Source: Defra, Environment Agency

As shown in Figure 6.4, the tonnage of packaging waste recycled within the UK has increased over recent years (at a compound annual growth rate of 1.5%), whilst the tonnage of recyclables exported has remained broadly static since 2015/16.

Recycling of packaging waste

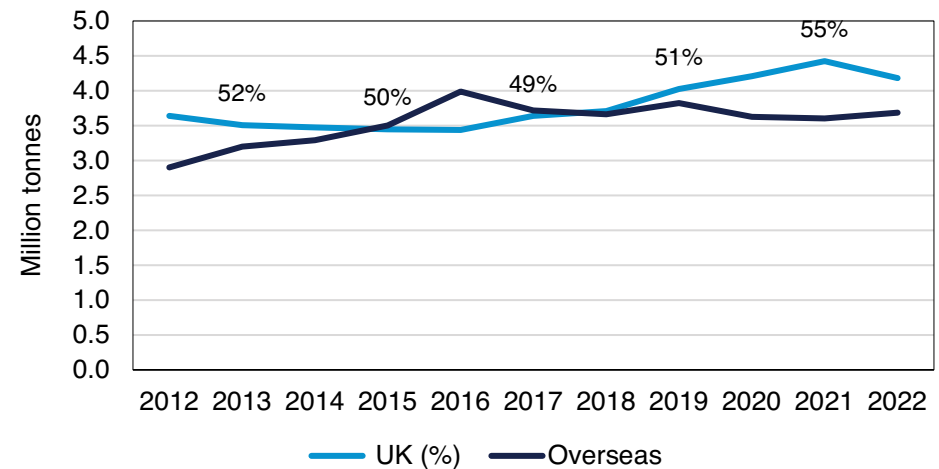


Figure 6.4 : UK proportion of packaging waste recycling
Source: Environment Agency National Packaging Waste Database¹¹

Paper and card (~2.5Mtpa) is the main recyclable packaging waste that is exported, as UK processing capacity for this waste has gradually declined over many decades or as the processing capacity in UK mills has gradually declined over decades. Whereas the tonnage of plastic packaging exported for recycling is declining slightly, as the plastic processing capacity in the UK grows.

Figure 6.5 shows the share of packaging by material type sent for recycling both overseas and in the UK during 2022.

Destination of packaging waste recycling

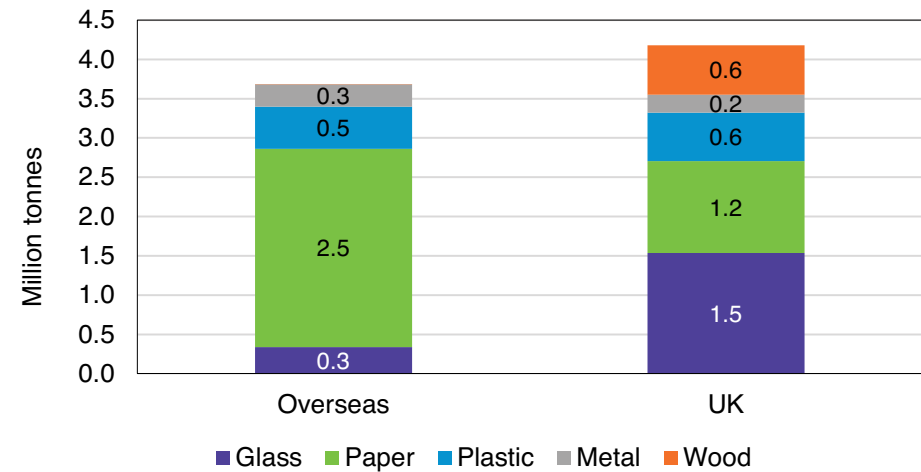


Figure 6.5: Destination of packaging waste recycling in 2022

Source: Environment Agency National Packaging Waste Database¹²



7. RESIDUAL WASTE TREATMENT

Residual waste, i.e. waste that has not been or cannot be recycled, may be presented as unprocessed “black bag” waste and also as waste arising from interim treatments. These could be such as lightly processed Refuse Derived Fuel (RDF) suitable for shipping (wrapped and baled) and/or a refined Solid Recovered Fuel (SRF), prepared to a specification that is generally used for co-incineration in a cement kiln.

The boundaries between presentations are often blurred and the level of treatment varies with market conditions and/or specific contracts. In this report, the three different forms are assessed jointly as residual waste, although some flows are specific to offtake solutions.

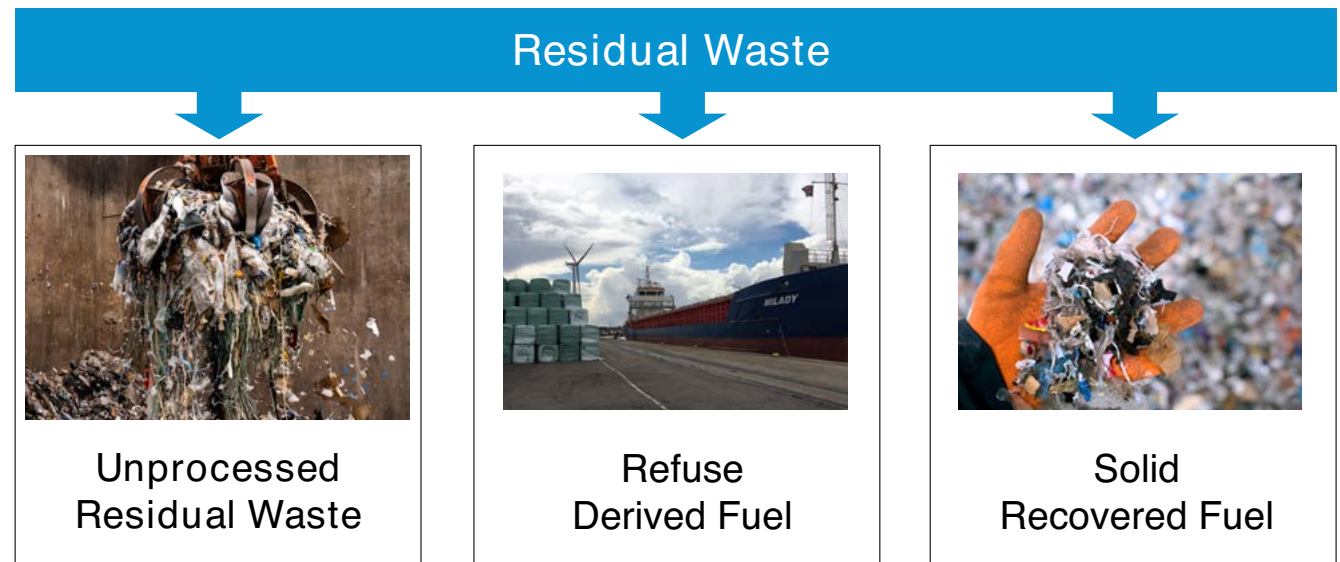


Figure 71: Example presentations of residual waste



Energy-from-Waste (EfW) has now become the dominant treatment option for residual waste. In 2022 UK EfWs processed 55% of residual waste.



The RDF export market to northern Europe grew rapidly, peaked in 2017, and has since declined due to increased UK EfW capacity and changing European market economics.



The co-incineration market primarily comprises the combustion of SRF by the cement industry, and potentially some emerging interest in the Waste-to-Fuel (WtF) developments.



Mechanical Biological Treatment (MBT) is a waste treatment option selected by some local authorities as an alternative to EfW. This treatment has declined over recent years as facilities have closed or been repurposed.



Landfill is effectively the option of last resort. There is currently no shortage of landfill capacity nationally in the UK, although some regional markets are tightening due to site closures. Potential landfill bans will impact this sector.

UK residual waste market

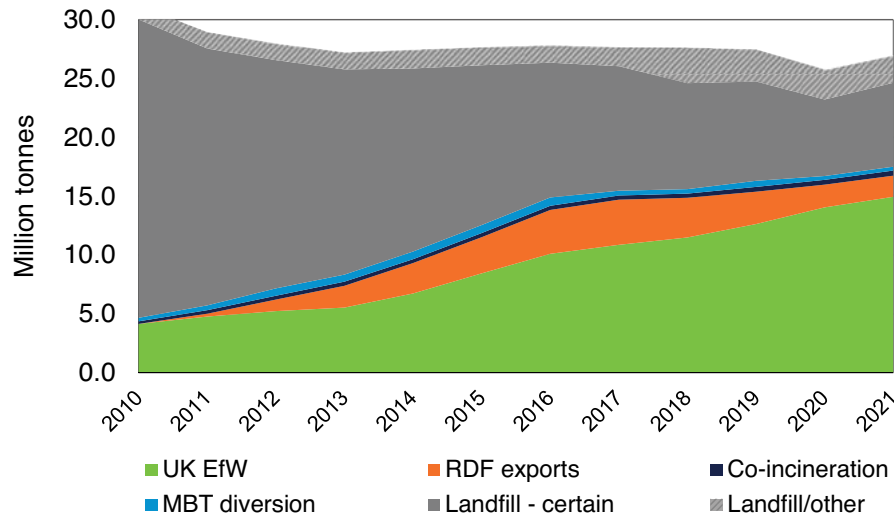


Figure 7.2: UK residual waste treatment Source: Tolvik analysis

As Figure 7.2 highlights, EfW is playing an increasingly significant role in the treatment of residual waste in the UK whilst MBT diversion, landfill and RDF exports decline. Other than the impact of COVID-19, overall tonnages of residual waste have been largely flat over recent years. The landfill/other category represents the tonnages of residual waste potentially unsuitable or unavailable for thermal treatment.

| MT | 2015 | 2017 | 2019 | 2021 |
|--------------------|-------------|-------------|-------------|-------------|
| UK EfW | 8.4 | 10.9 | 12.6 | 14.9 |
| RDF Exports | 3.1 | 3.8 | 2.8 | 1.8 |
| Co-Incineration | 0.4 | 0.4 | 0.4 | 0.4 |
| MBT Diversion | 0.7 | 0.4 | 0.5 | 0.3 |
| Landfill - Certain | 13.6 | 10.6 | 8.4 | 7.1 |
| Landfill/Other | 1.5 | 1.6 | 2.7 | 2.4 |
| Total | 27.7 | 27.7 | 27.5 | 27.0 |

The operational capacity of Energy-from-Waste infrastructure in the UK has grown steadily, from 19 facilities in 2010 to 57 operational facilities by the end of 2022, processing 15.3Mt of residual waste. This growth has primarily been driven by the investment confidence provided by the firm commitment of the UK Government to ongoing landfill tax increases, and the commitment by both local authorities and larger private sector waste collectors to commit tonnages of residual waste to facilities over long-term contracts.

Projected EfW operational capacity

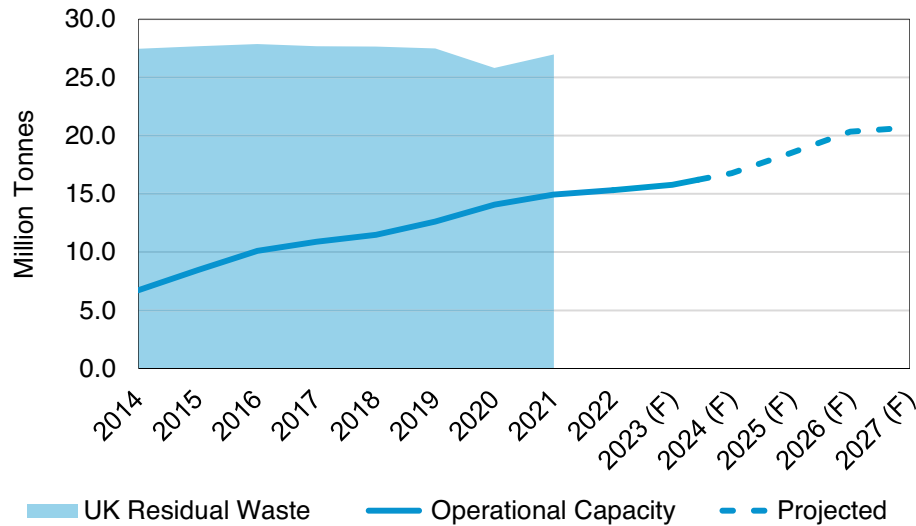


Figure 7.3: Projected EfW operational capacity and residual waste in the UK
Source: Tolvik¹³

At the beginning of 2023 there were 18 EfW facilities in construction with an estimated capacity of 5.7Mtpa. As shown in Figure 7.3, it is therefore estimated that the total UK operational capacity will be 20.7Mtpa by 2027.

Tolvik estimates that, from 2010, the total capital investment profile of EfW assets constructed in the UK through to 2027 is in the region of £15bn (estimated build costs, unadjusted).

Across the UK as a whole, the total recorded tonnage of wastes accepted at all types of permitted landfills over the past 10 years has remained broadly constant at c50Mt per annum. (Figure 7.4)

Total UK landfill inputs

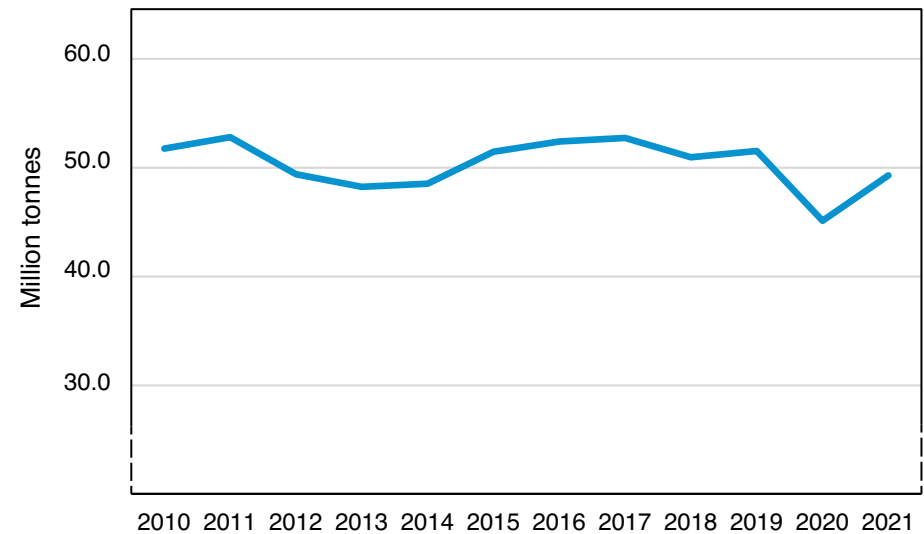
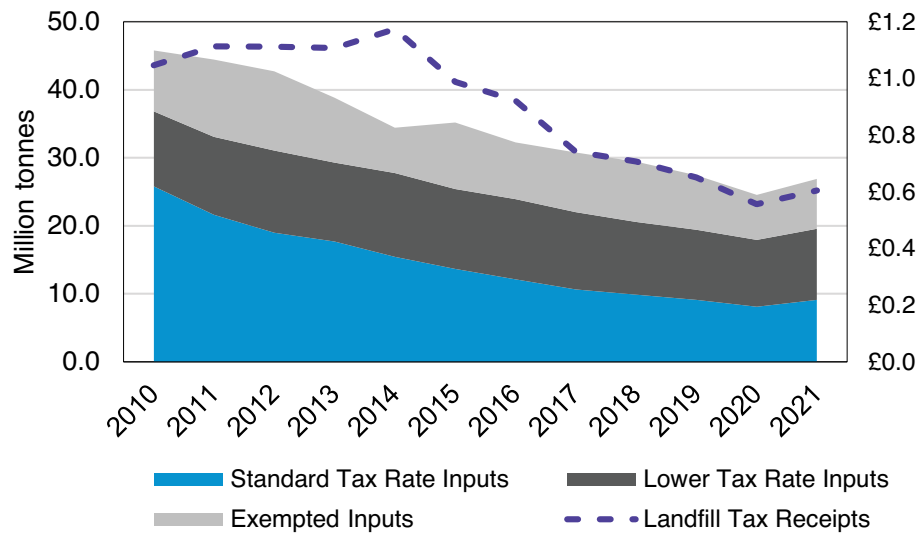


Figure 7.4: Total landfill inputs
Source: EA, SEPA, NRW and NIEA

Figure 7.5 below shows those landfill inputs that are subject to landfill tax returns. These tonnages reduced to 27Mt in 2021 from a high of 46Mt in 2014.

Landfill inputs and tax receipts



Landfill inputs of waste that are subject to the standard landfill tax rate declined from 26Mtpa to ~9Mtpa in 2021 whilst inputs of lower tax rate and exempted tonnages have been broadly stable at around 10Mtpa. In 2021, total collected tax receipts were circa £600m.

The fall in the input of waste subject to the standard landfill tax rate has, in part, been driven by the development of EfW capacity in the UK.

For more information about the recycling and waste treatment sector, please visit www.esauk.org or email info@esauk.org

Figure 7.5: Landfill inputs and tax receipts

Source: Tolvik analysis of HMRC, Revenue Scotland and Welsh Govt.

Endnotes

- 1 Dept. for Environment, Food & Rural Affairs, UK Statistics on Waste (Defra) (2023):
<https://www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste>
- 2 Department for Levelling Up Housing and Communities (DLUHC):
<https://www.gov.uk/government/statistics/local-authority-revenue-expenditure-and-financing-england-2021-to-2022-individual-local-authority-data-outturn>
- 3 Welsh Government: **<https://statswales.gov.wales/Catalogue/Local-Government/Finance/Revenue/Outturn/revenueoutturnexpendituresummary-by-service>**
- 4 Scottish Government: **<https://www.gov.scot/publications/scottish-local-government-finance-statistics-slgfs-2021-22-workbooks/>**
- 5 Dept. for Environment, Food & Rural Affairs, UK Statistics on Waste (Defra) (2023):
<https://www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste>
- 6 Dept. for Environment, Food & Rural Affairs, UK Statistics on Waste (Defra) (2023):
<https://www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste>
- 7 Monksleigh (2023): **<https://monksleigh.com/reports.php>**
- 8 Monksleigh (2023): **<https://monksleigh.com/reports.php>**
- 9 360 Environmental: **https://www.360environmental.co.uk/producer_responsibility_packaging_regulations**
- 10 Dept. for Environment, Food & Rural Affairs, UK Statistics on Waste (Defra) (2023):
<https://www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste>
- 11 Environment Agency, National Packaging Waste Database:
<https://npwd.environment-agency.gov.uk/Public/PublicSummaryData.aspx>
- 12 Environment Agency, National Packaging Waste Database:
<https://npwd.environment-agency.gov.uk/Public/PublicSummaryData.aspx>
- 13 Tolvik UK EfW Statistics (2023)

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