Department
for Environment
Food & Rural Affairs

Digest of Waste and Resource Statistics – 2016 Edition (revised)

March 2016

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Contents

Foreword **5**
Introduction **5**
Official Statistics **5**
Waste Prevention Metrics **6**
Updating charts and tables **6**
Summary **7**
Section 1: Resource flows, efficiency of resource use, electricity from bioenergy **8**
Resource flows 8
UK Domestic Extraction 9
UK Imports and Exports 10
UK Domestic Material Consumption 11
Domestic Material Consumption (DMC) per capita 12
Raw Material Consumption (RMC) and Domestic Material Consumption (DMC), UK 13
Growth in the economy and efficiency of resource use. 14
Electricity from Bioenergy 16
Section 2: Waste Generation **18**
Waste Arisings 18
Waste from Households 19
Commercial and Industrial Waste 22
Packaging in UK 23
Battery Waste 24
Hazardous Waste 24
Section 3: Waste Hierarchy and destination of waste **25**
Depiction of Waste Hierarchy 25
Destination of waste 26
Local Authority Collected Waste 26
Local authority household residual waste collection schemes from kerbside 27
Municipal Waste to landfill including Biodegradable Municipal Waste (BMW) 28
Biodegradable Municipal Waste to landfill in UK as % of target 29
Waste from households: recycling 30
Section 4: Waste Composition **32**
Composition of waste from households 32
Composition of dry recycling 33
Section 5: Food Waste **34**
UK food and drink waste through the food chain 34
Cost of food purchased that is wasted 35
Hospitality sector food waste, UK 36
Percentage of Local authorities collecting food waste 37
Section 6 Economic characteristics of the waste management sector **38**
Gross Value Added of the waste management sector as a percentage of the whole economy. 38
Gross Value Added by waste management sector 39
GVA of waste management sector 39
GVA per hour of waste management sector 41
Index of GVA and C&I waste 42
GVA for repair, re-use and leasing sectors 43
Exports of scrap materials 44
Exports of Refuse-Derived Fuel 45
Employees in the waste sector 47
Employees in the waste sector, GB 47
Employees in the waste sector, UK 49
Section 7: Waste Infrastructure **50**

Permitted estate at end of 2014, England 50
Anaerobic digestion 51
Landfill sites 52
Gate Fees 53
Waste Management Infrastructure, England 54
Section 8: Environmental issues relating to waste 56
Local Environment Quality - percentage of survey sites below an acceptable standard 56
Emissions from landfill 57
Carbon Metric Factors 58
Section 9: Fly tipping, Waste Crime and Pollution Incidents 61
Fly tipping 61
Waste Crime 65
Illegal Waste Sites 65
Pollution Incidents 66
Section 10: EU and UK comparisons 70
Recycling rate for packaging waste 70
Recovery rates for packaging waste 71
Material Productivity 72
Glossary 77

Foreword

This is the second edition of the Digest. The format and many of the subjects covered are the same as for the first edition, but there is also some new content.

Waste and resource are subjects for which there is a wealth of published data. It can therefore sometimes be challenging to readily find the data of interest. The aim of this Digest is to help by bringing together a wide range of key statistics on waste and resource into one publication.

The Digest is aimed at a wide audience, including policymakers, analysts and specialists in the Defra Network, Environment Agency, WRAP, other organisations, the waste sector, academia, other researchers and consultancies.

The authors are indebted to all those who helped develop the Digest by suggesting and providing material and commenting on the drafts.

Introduction

The Digest of Waste and Resource Statistics is a compendium of statistics on a range of waste and resource areas, based on data published mainly by Defra, WRAP, the Environment Agency, Office for National Statistics and Eurostat. They are collated in this Digest for ease of use.

The various sets of data are not all for the same time periods but the most recent available data has been used.

The Digest starts with resource use in the UK – this looks at the physical flow of available materials through the economy, followed by sections looking at waste.

Official Statistics

These statistics have been produced to the high professional standards set out in the Code of Practice for Official Statistics, which sets out eight principles including meeting user needs, impartiality and objectivity, integrity, sound methods and assured quality, frankness and accessibility.

More information on the Official Statistics Code of Practice can be found at www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html.

Waste Prevention Metrics

Included in the Digest are 6 data sets which have been chosen as being suitable indicators, taken collectively, for monitoring waste prevention. These are:

- Raw Material Consumption per unit of GDP. (Page 15)
- Waste arisings by sector (construction and demolition, commerce, industry, household). (Page 18)
- Hazardous waste arisings by sector. (Page 24)
- Waste arising per unit of gross value added for the commercial and industrial sector. (Page 42)
- Gross value added of the repair and reuse sector. (Page 43)
- GHG emissions from landfill. (Page 57)

These items have been individually labelled 'waste prevention metric' within the Digest.

Developing metrics to serve as indicators to monitor progress on waste prevention is a key part of the Waste Prevention Programme for England. More information is available through the link below:

www.gov.uk/government/publications/waste-prevention-programme-for-england

Updating charts and tables

The Waste Statistics Regulation is updated every 2 years, therefore some tables and charts that were in the 2015 edition cannot be updated. These have been removed from this edition but will be reinstated in the next edition.

Summary

Resource Use: (Section 1)

- Domestic Material Consumption measures the amount of materials used in the economy
- In 2013, Domestic Material Consumption was 570 million tonnes – a slight increase from 2012, this was driven by increases in the extraction of biomass.
- In 2013, Raw Material Consumption (excluding fossil fuels) was 410 million tonnes - the same as 2012.

Waste from Households: (Section 2)

- Waste arising from households in the UK increased by 3.3 per cent between 2013 and 2014, but the 2014 tonnage is a decrease of 0.6 per cent since 2010.

Food Waste: (Section 5)

- 15 million tonnes of food and drink was wasted in the food chain in 2013. This is equivalent to around one third of the 41 million tonnes of food that is bought annually in the UK

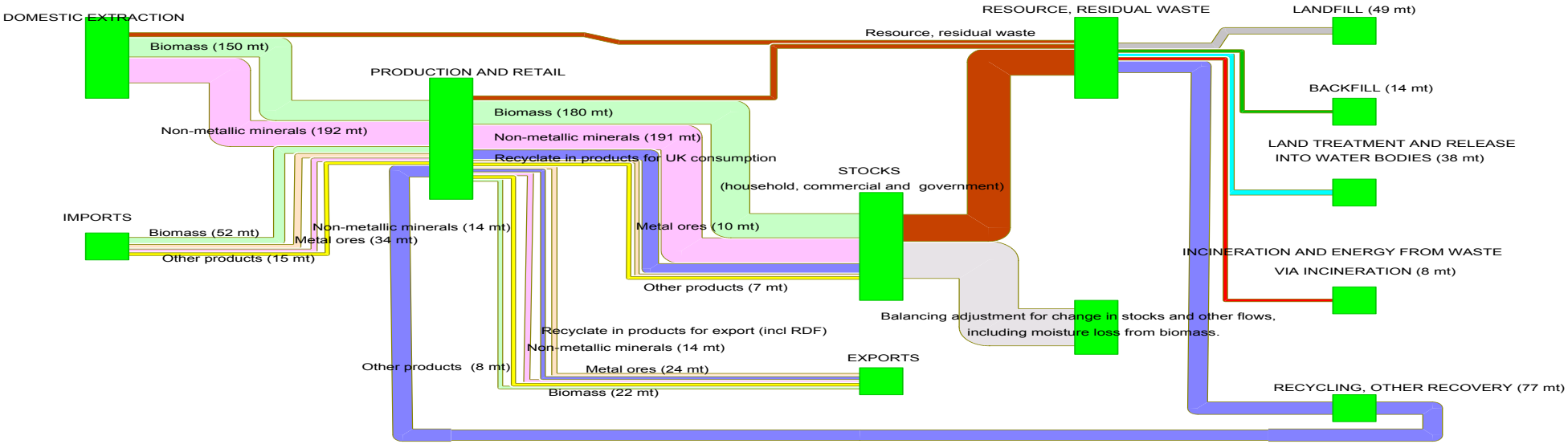
Flytipping: (Section 9)

- Local Authorities dealt with 900 thousand incidents of fly-tipping in 2014/15 in England, ranging in size from single black bag to tipper lorry load
- 66 per cent of all fly-tips in England in 2014/15 were household waste. This was nearly 590 thousand incidents, one for every 40 households.

Section 1: Resource flows, efficiency of resource use, electricity from bioenergy

Resource flows

Figure 1.1: Sankey diagram of flow of resource in the UK, 2012 (revised data), (excluding fossil fuels and energy carriers)



- Figure 1.1 depicts the flow of material resource, including waste, in the UK in one year (2012).
- A Sankey diagram approach is helpful in depicting the 'circular economy' and can quickly illustrate the relative sizes of throughput of resource and the proportion recovered, including recycling. Broadly speaking, the flows are from left to right, apart from 'recycling, other recovery' which flows clockwise.
- Some processes, such as metal re-melt, allow recycling many times in a closed loop, whilst others, such as formation of glass aggregate, recycle materials once to a lower value product.

Notes: Data on landfill, backfill, incineration, land treatment, recycling and other recovery are from Eurostat. Please note that the 'pipes' are not all to scale
The data for domestic extraction, imports and exports is drawn from the material flows within the Environmental Accounts published by ONS
Source: www.ons.gov.uk/economy/environmentalaccounts/bulletins/ukenvironmentalaccounts/2015-07-09#material-flows

UK Domestic Extraction

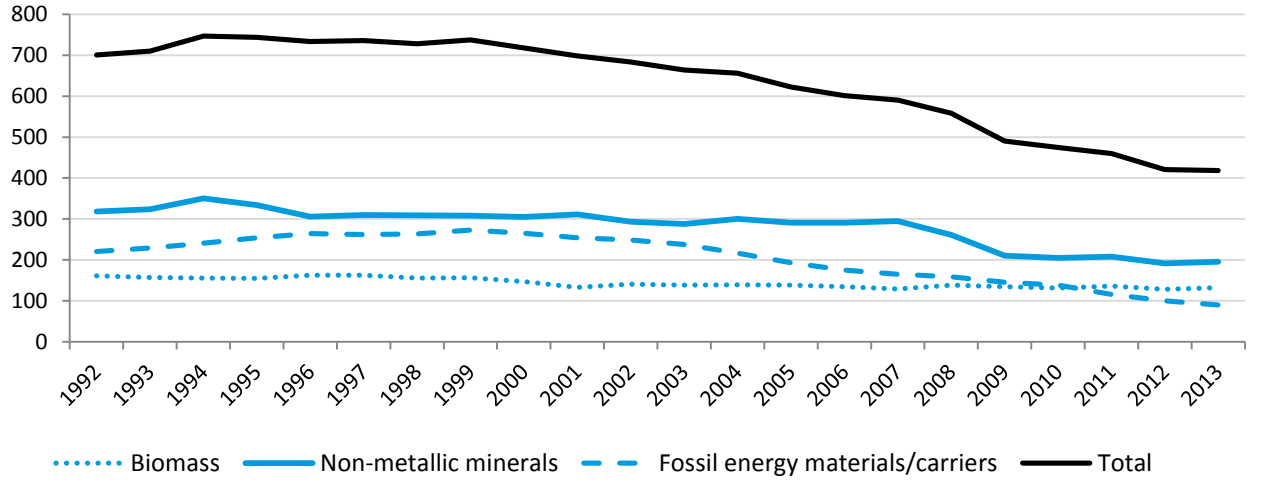
Table 1.1: UK Domestic Extraction 2003 – 2013

Million metric tonnes

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Biomass	139	138	135	129	138	134	131	136	129	132
Metal Ores	0	0	0	0	0	0	0	0	0	0
Non-metallic minerals	300	291	291	295	261	210	205	208	192	196
Fossil energy materials/carriers	217	193	175	165	159	146	139	116	100	90
Total	**656**	**622**	**601**	**590**	**559**	**491**	**475**	**460**	**421**	**419**

Figure 1.2: UK Domestic Extraction 1992 – 2013

Million metric tonnes



- Domestic Extraction shows the amount of resources from the natural environment that are available for use in the economy.
- Since 2000, the quantity of materials extracted for use in the UK has gradually declined and was 419 million metric tonnes in 2013, a 0.5 per cent increase from 2012 (421 million tonnes), this was driven by increases in the extraction of biomass.
- This represented 6.5 tonnes per capita (per person) in 2013.

Notes: Metal ores are not included on the chart as the quantity extracted is small

Source: Department for Environment, Food and Rural Affairs; Food and Agriculture Organization of the United Nations; Eurostat; European Forest Institute; Kentish Cobnuts Association; British Geological Survey, www.ons.gov.uk/economy/environmentalaccounts/bulletins/ukenvironmentalaccounts/2015-07-09#material-flows- Figure 7.1

UK Imports and Exports

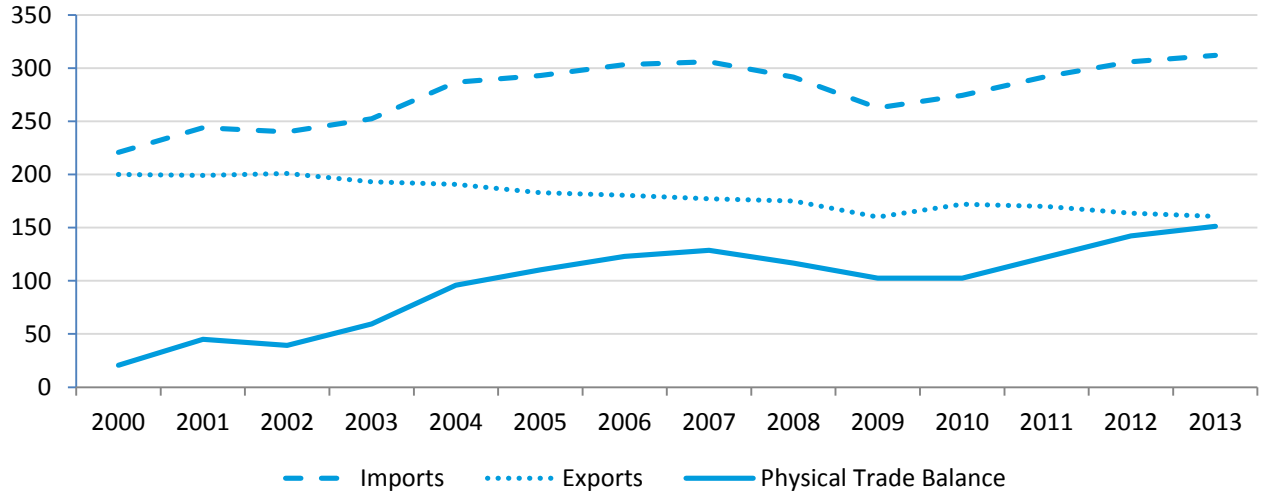
Table 1.2: UK Imports, Exports and Physical Balance 2004 – 2013

Million metric tonnes

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Imports	287	293	303	306	292	263	274	292	306	312
Exports	191	183	180	177	175	160	172	170	164	161
Physical Balance	96	110	123	129	117	103	102	122	142	151

Figure 1.3: UK Imports, Exports and Physical Balance 2000 – 2013

Million metric tonnes



- Imports and exports show the amount of resources passing through the economy.
- The Physical Trade balance equals Imports minus Exports.
- In 2013, the Physical Trade balance was 151 million tonnes.
- The widening gap between physical imports and exports suggests that the UK is becoming more reliant on the production of materials in other countries.
- The increase in imports is partly offset by the decrease in domestic extraction.

Source: HM Revenue and Customs, Office for National Statistics
www.ons.gov.uk/economy/environmentalaccounts/bulletins/ukenvironmentalaccounts/2015-07-09#material-flows– Figure 7.2

UK Domestic Material Consumption

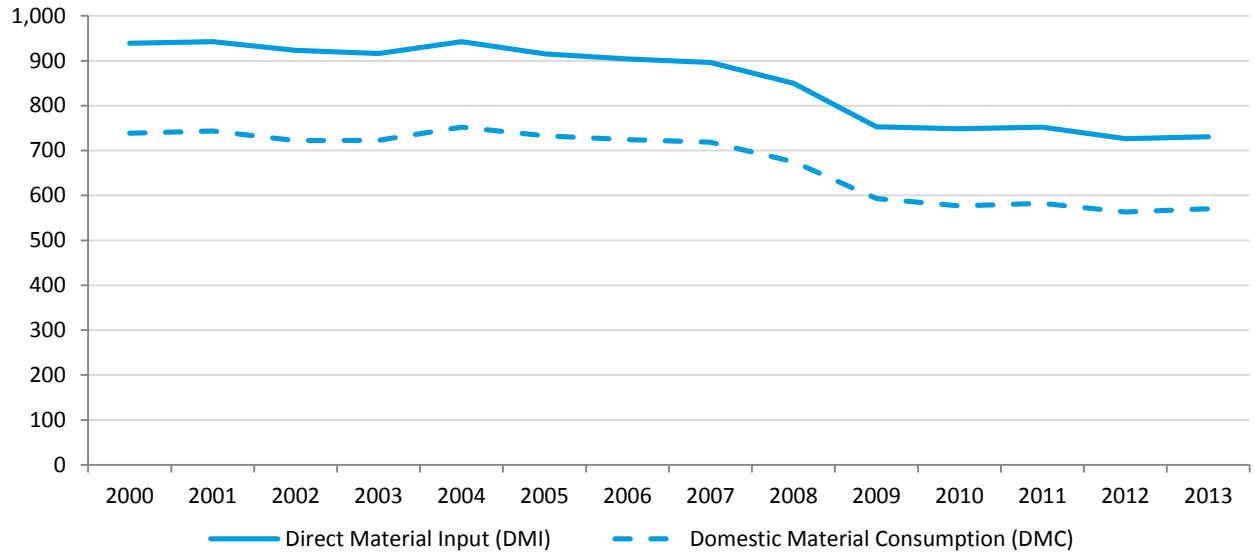
Table 1.3: UK Direct Material Input (DMI) and Domestic Material Consumption (DMC), 2004 – 2013.

Million metric tonnes

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Direct Material Input (DMI)	943	915	904	896	850	753	749	752	727	731
Domestic Material Consumption (DMC)	752	733	724	719	675	593	577	582	563	570

Figure 1.4: UK Direct Material Input and Domestic Material Consumption, 2000 to 2013

Million metric tonnes



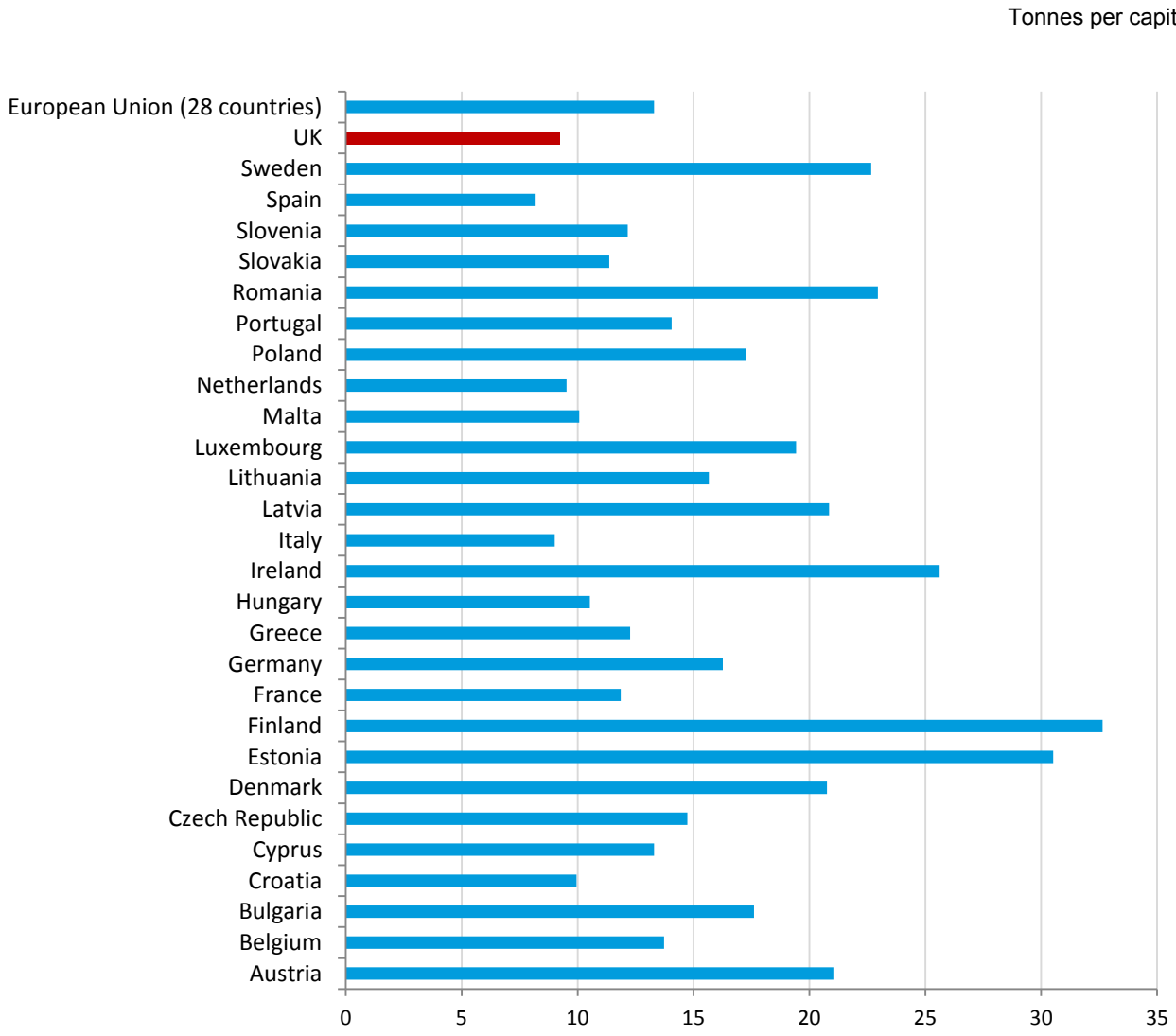
- In 2013, DMC was 570 million tonnes, and DMI was 731 million tonnes – a slight increase from 2012. This was caused by an increase in extraction of biomass.
- In 2013, DMI represented 11.4 tonnes per capita and DMC represented 8.9 tonnes per capita.

Notes: Direct Material Input (DMI) (Domestic extraction + Imports) measures the total amount of materials available for use in the economy, Domestic Material Consumption (DMC) (Domestic extraction + Imports – Exports) measures the amount of materials used in the economy, and is calculated by subtracting exports from DMI.

Source: Office for National Statistics
www.ons.gov.uk/economy/environmentalaccounts/bulletins/ukenvironmentalaccounts/2015-07-09#material-flows - Figure 7.3

Domestic Material Consumption (DMC) per capita

Figure 1.5: Domestic Material Consumption per capita, for EU member states, 2013



- In 2013, DMC per capita was highest in Finland at 32.6 tonnes per capita and lowest in Spain at 8.2 tonnes.
- In 2013, the UK figure of 9.2 tonnes per capita, was the third lowest figure, and below the EU-28 figure of 13.3 tonnes per capita. This is due to the UK extracting a significantly lower amount of non-metallic minerals.
- Finland's high level of DMC per capita reflects a low population density and a high resource extraction from woodlands.
- Figures should be treated with some caution, particularly when making comparisons across Member States, as we have not robustly verified the quality of the data from other Member States.

Source: Eurostat
ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=t2020_rl110&plugin=1

Raw Material Consumption (RMC) and Domestic Material Consumption (DMC), UK

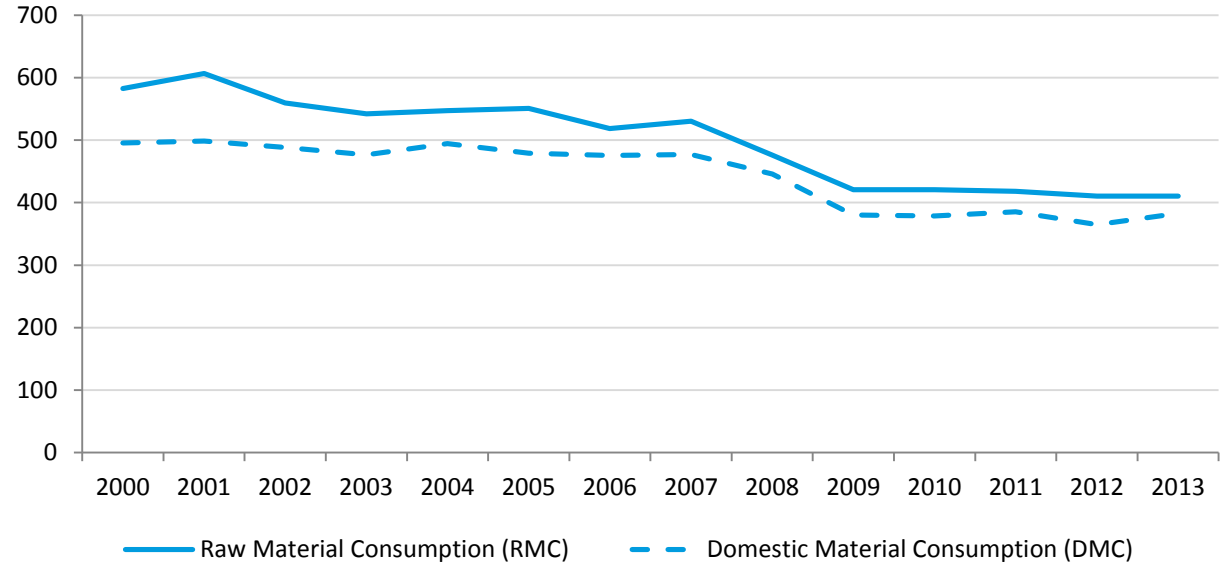
Table 1.4: Raw Material Consumption and Domestic Material Consumption (excluding fossil fuels), UK, 2004 – 2013

Million metric tonnes

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
DMC	495	479	476	477	446	380	379	385	365	383
RMC	547	551	518	531	476	421	421	418	410	410

Figure 1.6: UK Raw Material Consumption and Domestic Material Consumption (excluding fossil fuels), 2000 – 2013

Million metric tonnes



- In 2013, RMC excluding fossil fuels was 410 million tonnes, which was 7 per cent higher than DMC at 383 million tonnes.
- Estimates peaked in 2001 at 560 million tonnes, which was almost 12 per cent higher than DMC at 498 million.

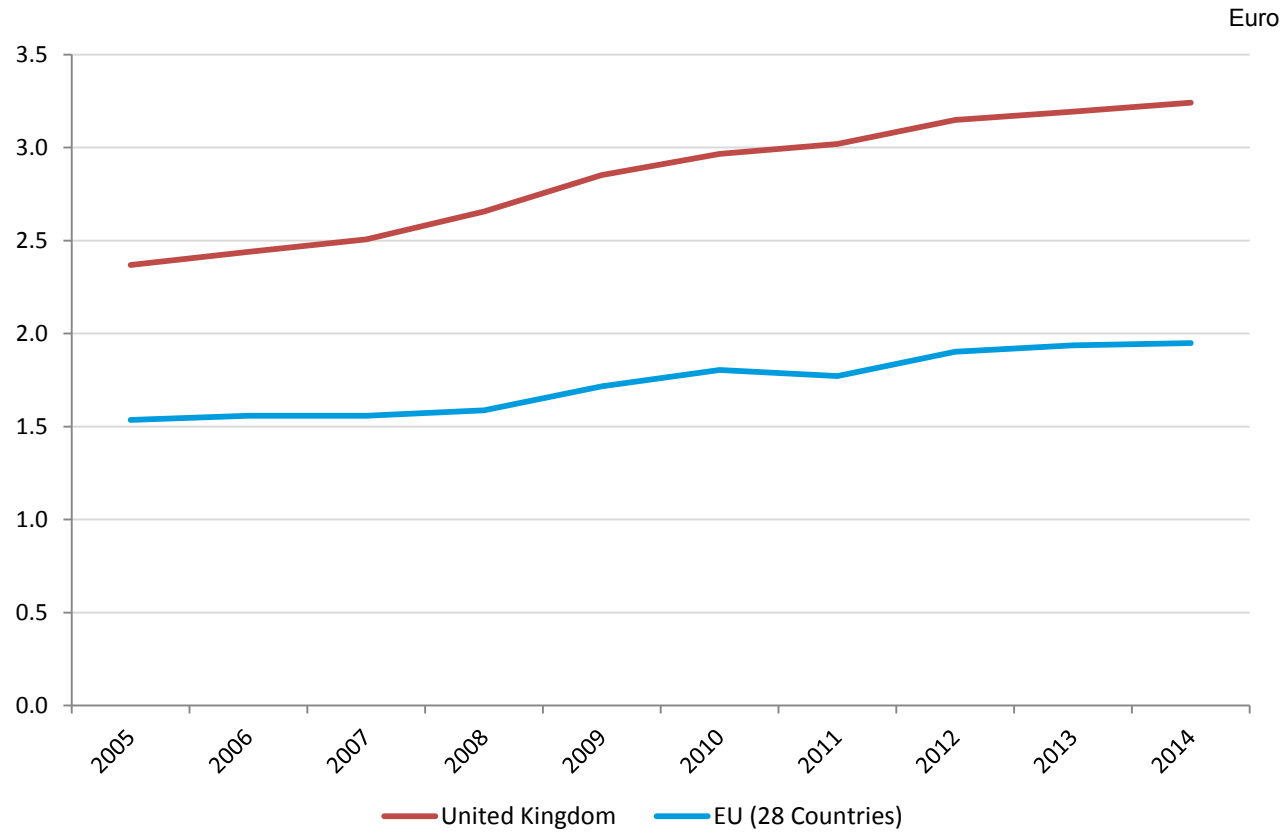
Notes: A limitation of the DMC indicator is its 'asymmetry': it measures the domestic extraction of material resources in tonnes of gross harvest and ore, whereas the imports are measured according to the weight of goods crossing the boundary independent of how far the imported products have been processed (Eurostat, 2012).

The Raw Material Consumption (RMC) indicator is designed to overcome this asymmetry. In addition to domestic extraction, RMC includes imports expressed or converted into their Raw Material Equivalents (RME) (into equivalents of domestic extraction from the rest of the world to produce the respective goods

Source: ONS
www.ons.gov.uk/economy/environmentalaccounts/articles/ukenvironmentalaccountshowmuchmaterialistheukconsuming/ukenvironmentalaccountshowmuchmaterialistheukconsuming

Growth in the economy and efficiency of resource use.

Figure 1.7: Gross Domestic Product per tonne of Domestic Material Consumption, EU_28 and UK, 2005 – 2014



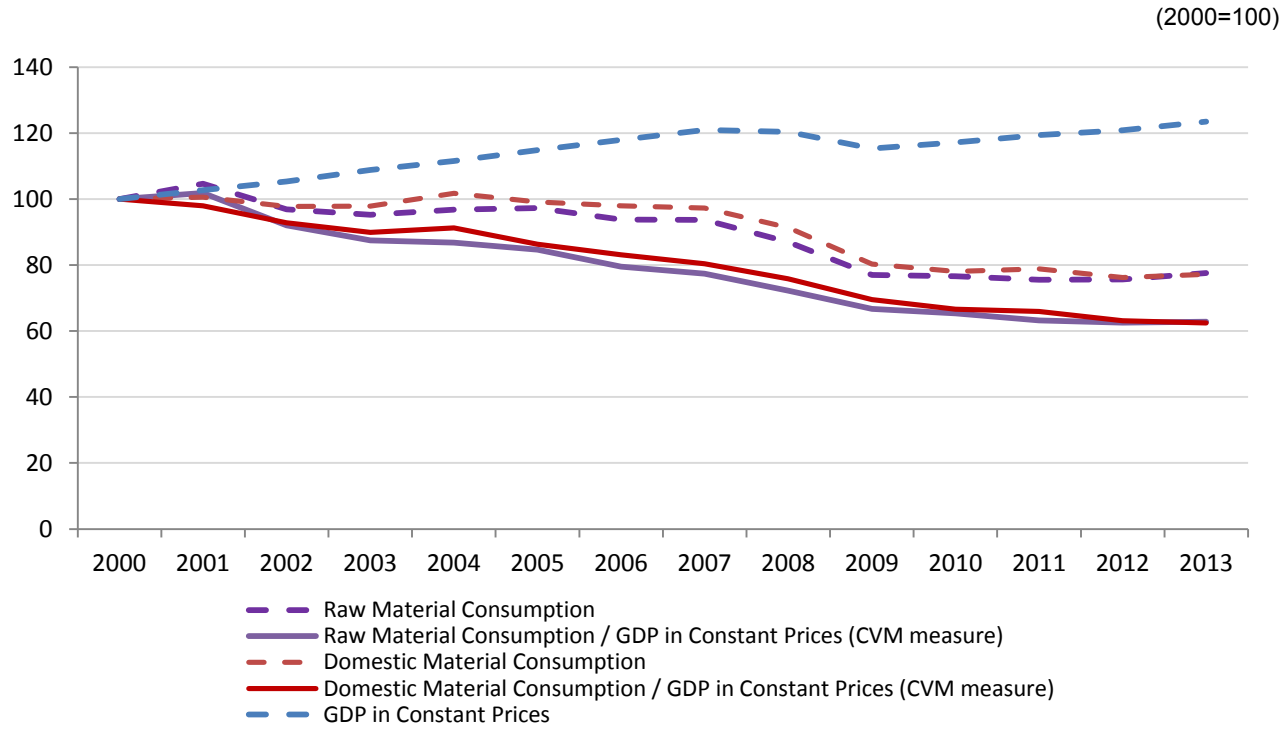
- This series has been revised since the last Digest – and now accounts for EU_28, not EU-27.
- GDP per tonne of Domestic Material Consumption has shown an increase since 2005 for both the UK and the EU_28. This possibly suggests some weakening in any link between economic growth and DMC.

Notes: Resource productivity is gross domestic product (GDP) divided by domestic material consumption (DMC).

For the calculation of resource productivity Eurostat uses the GDP in units of Euros in chain-linked volumes to the reference year 2010 at 2010 exchange rates

Source: epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdpc100

Figure 1.8: Index values of Raw Material Consumption and Domestic Material Consumption per unit of GDP in constant prices. *(Waste Prevention Metric)*



- Since 2000, raw material resource consumption per unit of GDP has reduced; this suggests that there has been some decoupling of resource use and income generation across the economy.

Notes: GDP given in CVM (Reference Year 2012)

A limitation of the DMC indicator is its 'asymmetry': it measures the domestic extraction of material resources in tonnes of gross harvest and ore, whereas the imports are measured according to the weight of goods crossing the boundary independent of how far the imported products have been processed (Eurostat, 2012).

The Raw Material Consumption (RMC) indicator is designed to overcome this asymmetry. In addition to domestic extraction, RMC includes imports expressed or converted into their Raw Material Equivalents (RME) (into equivalents of domestic extraction from the rest of the world to produce the respective goods

Source: Office for National Statistics: www.ons.gov.uk/economy/grossdomesticproductgdp/timeseries/abmi www.ons.gov.uk/economy/environmentalaccounts/articles/ukenvironmentalaccountshowmuchmaterialistheukconsuming /ukenvironmentalaccountshowmuchmaterialistheukconsuming

Electricity from Bioenergy

Table 1.5: Electricity generated from Bioenergy, UK, 2009 – 2014, Gigawatt hours

GWh

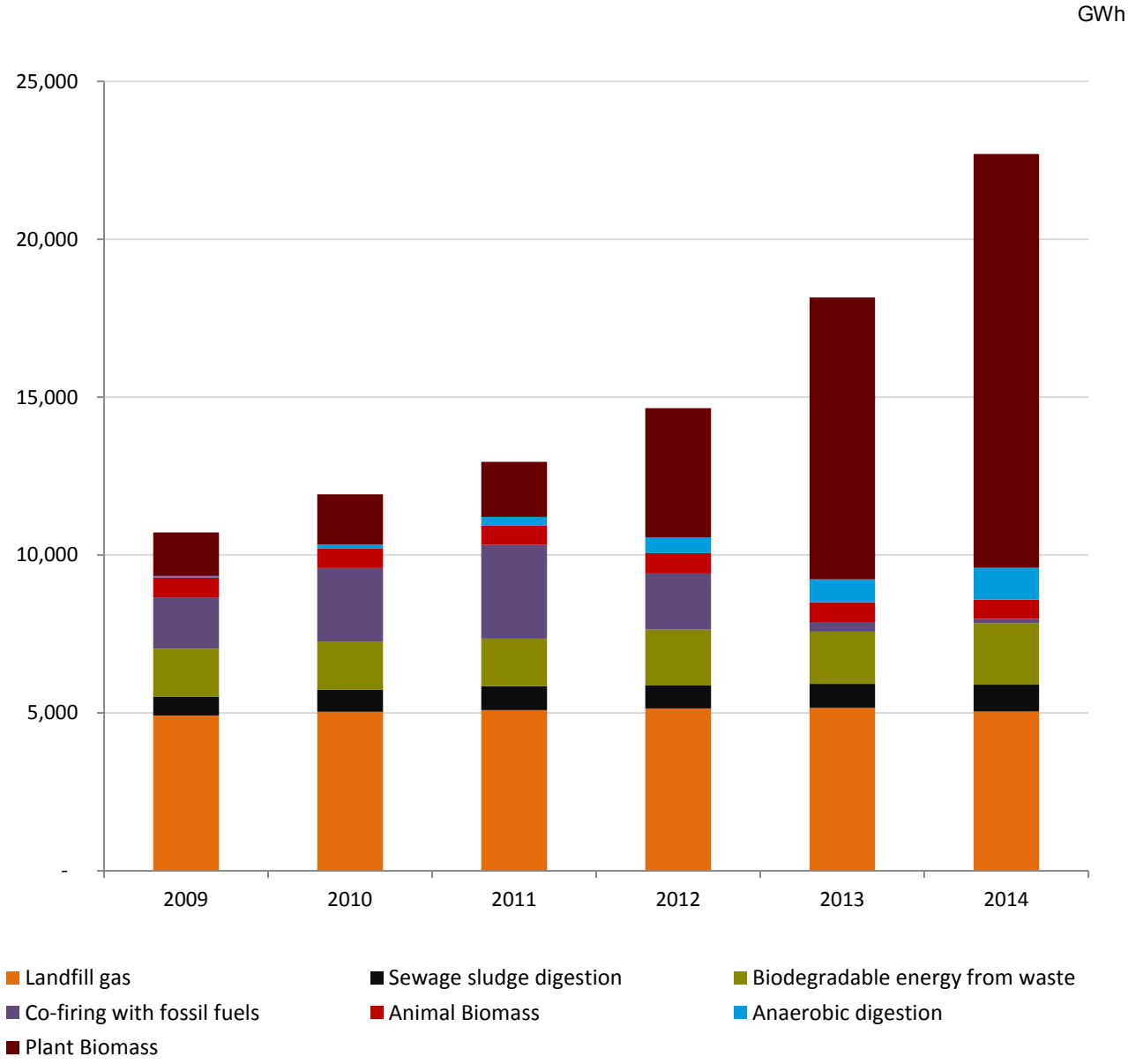
	2009	2010	2011	2012	2013	2014
Landfill gas	4,918	5,031	5,085	5,145	5,160	5,045
Sewage sludge digestion	603	697	764	719	761	845
Energy from waste [1]	1,509	1,530	1,503	1,774	1,649	1,950
Co-firing with fossil fuels	1,625	2,332	2,964	1,783	309	133
Animal Biomass [2]	637	627	615	643	628	614
Anaerobic digestion	43	111	273	501	722	1,009
Plant Biomass [3]	1,379	1,593	1,749	4,083	8,929	13,105
Total electricity generated from Bioenergy	**10,714**	**11,921**	**12,953**	**14,648**	**18,159**	**22,702**
Total electricity generated from all sources	**342,011**	**347,846**	**332,461**	**328,270**	**324,725**	**300,823**

[1] –Biodegradable part only,

[2] –Includes the use of poultry litter and meat and bone

[3] . -Includes the use of straw combustion and short rotation coppice energy crops.

Fig 1.9: Electricity generated from Bioenergy, UK, 2009 – 2014, Gigawatt hours



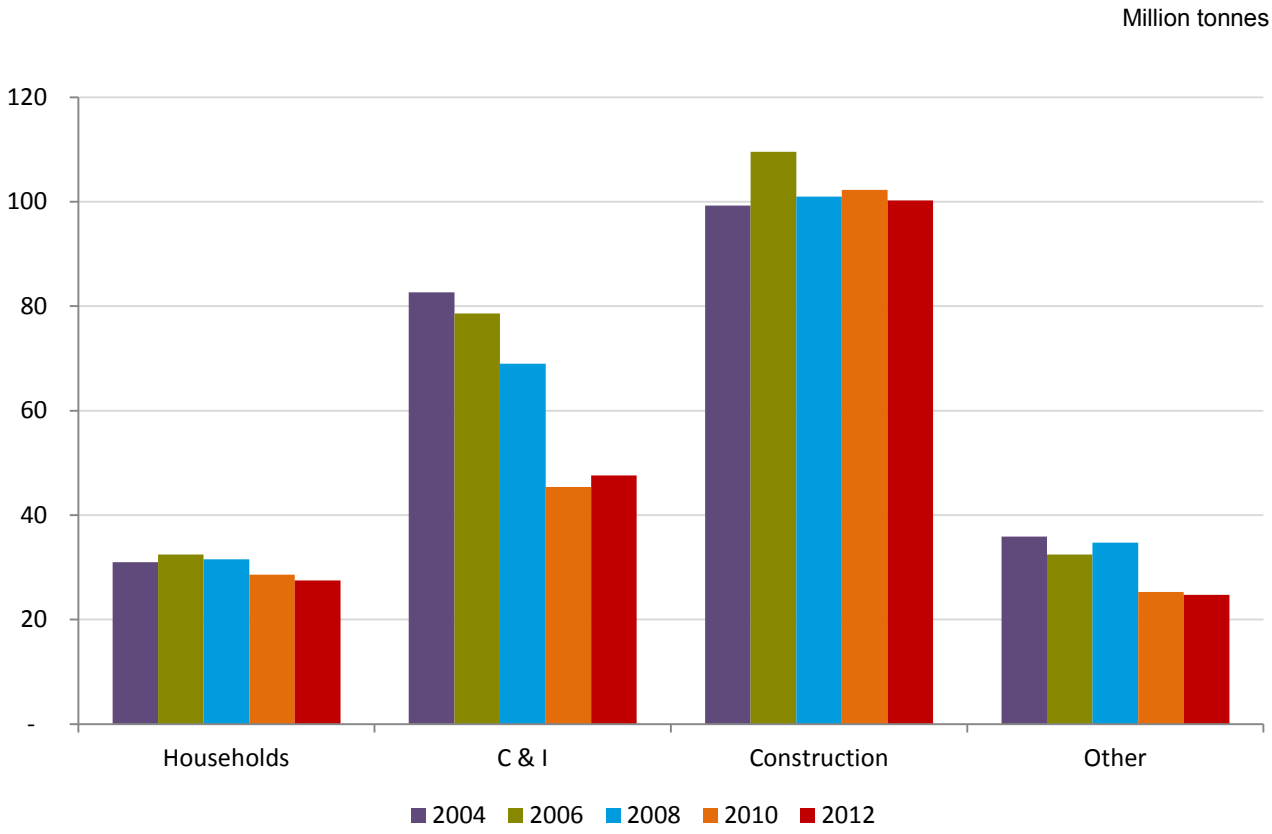
- The amount of electricity generated from Bioenergy in the UK has increased since 2009.
- In 2014, 7.5 per cent of electricity generated was from Bioenergy, an increase from 3.1 per cent in 2009.

Source:
www.gov.uk/government/uploads/system/uploads/attachment_data/file/454482/DUKES_2015_internet_content.pdf
Table 6.1.1

Section 2: Waste Generation

Waste Arisings

Figure 2.1: Waste arisings by sector, UK, 2004 – 2012 (*Waste Prevention Metric)*



[1] 'Other' waste includes waste from the mining and quarrying, and agriculture, forestry and fishing sectors

- Figure 2.1 shows the amount of waste produced in the UK from 2004 -2012.
- The construction sector produces the largest amount of waste.
- This data is updated on a 2 yearly basis so there will be an update showing 2014 data available in 2016.

Notes: Please note that whilst figures for UK arisings are reasonably robust for all years, for years prior to 2010 there were some significant methodological differences compared to later years. Readers are advised therefore to exercise caution when drawing any observations or conclusions from looking at trends which include years prior to 2010.

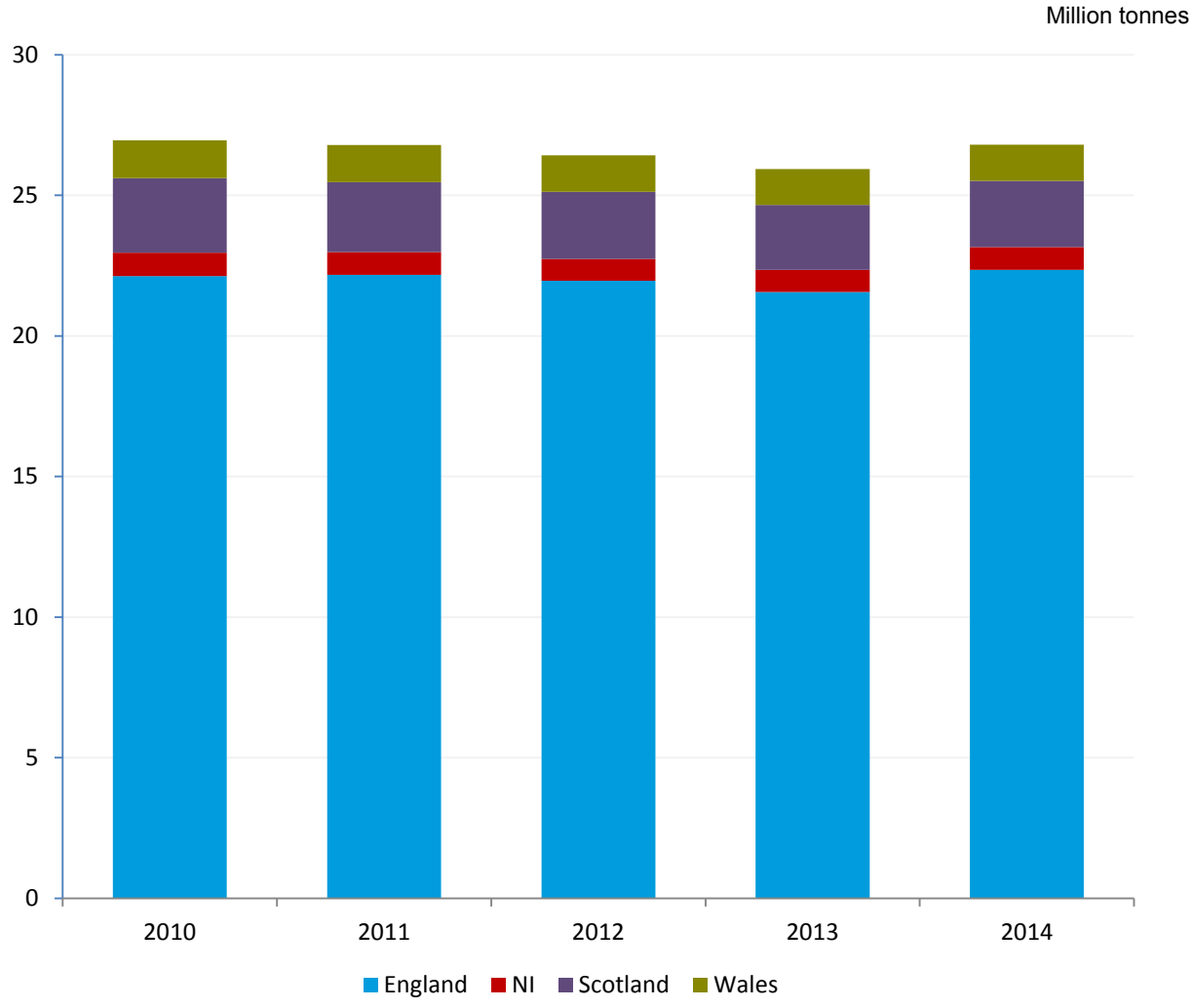
Source: Eurostat.

Waste from Households

Table 2.1: Waste arisings from households (Million tonnes) and household expenditure (2014 prices) UK, 2010 - 2014

Waste from Households arisings (million tonnes)	2010	2011	2012	2013	2014
UK	27.0	26.8	26.4	25.9	26.8
England	22.1	22.2	22.0	21.6	22.4
Scotland	2.6	2.5	2.4	2.3	2.3
Wales	1.3	1.3	1.3	1.3	1.3
Northern Ireland	0.8	0.8	0.8	0.8	0.8
UK total household annual expenditure £th (2014 prices)	27.4	26.8	26.4	27.2	27.6

Figure 2.2: Waste arisings from households, UK, 2010 - 2014



- The 'waste from households' calculation was first published by Defra in May 2014. It was introduced for statistical purposes to provide a harmonised UK indicator with a comparable calculation in each of the four UK countries and to provide a consistent approach to report recycling rates at UK level on a calendar year basis under the Waste Framework Directive (2008/98/EC).
- The waste from household measure is a narrower measure than the 'household waste' measure which was previously used and excludes waste not considered to have come directly from households, such as recycling from street bins, parks and grounds.
- Waste arising from households in the UK increased by 3.3 per cent between 2013 and 2014. The 2014 tonnage is a decrease of 0.6 per cent since 2010.
- The total weekly average household expenditure in the UK increased by over 1 per cent in 2014 compared to 2013.

Notes: Waste from households' includes waste from: Regular household collection, Civic amenity sites, 'Bulky waste' 'Other household waste'. It does not include street cleaning/sweeping, gully emptying, separately collected healthcare waste, asbestos waste. 'Waste from households' is a narrower measure than 'municipal waste' and 'council collected waste'.

Source: Defra, Sept 2014, www.gov.uk/government/statistical-data-sets/env23-uk-waste-data-and-management. Table 1_1

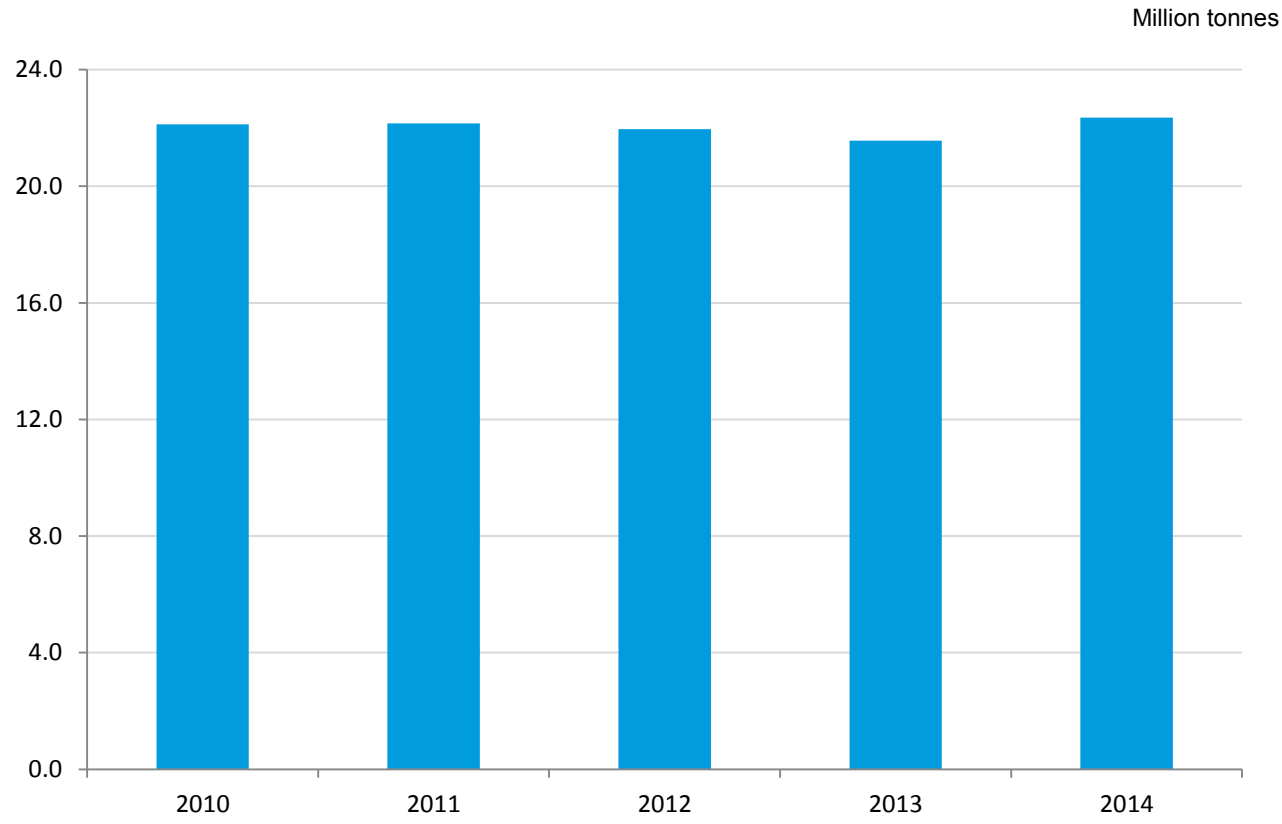
ONS: Total weekly average household expenditure
www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/compendium/familyspending/2015/chapter4trendsinhouseholdexpenditureovertime

Table 4.1 Row 52

Table 2.2: Waste from households, England, 2010 – 2014 *(Waste Prevention Metric)*

	2010	2011	2012	2013	2014
Total waste generated from households (000 tonnes)	22,131	22,170	21,956	21,564	22,355
Waste generated (kg per person)	425	419	411	403	413

Figure 2.3: Waste from households, England, 2010 - 2014



- Total waste generated by households increased by 3.7 per cent from 21.6 million tonnes in 2013 to 22.4 million tonnes in 2014.
- This increase is due to increases in waste from kerbside collections and bulky waste at civic amenity centres which were subsequently sent for disposal.
- This waste amounted to 413 kg per person in 2014.
- A breakdown of the previous measure of household waste covering national, regional and local authorities can be downloaded on the gov.uk website.

Source: Defra, Dec 2015, www.gov.uk/government/statistical-data-sets/env18-local-authority-collected-waste-annual-results-tables Calendar year data, Table 1 Row 2.

Household waste covering national, regional and local authority breakdown: www.gov.uk/government/uploads/system/uploads/attachment_data/file/481060/LA_and_Regional_spreadsheet_2014-15_publication.ods

Commercial and Industrial Waste

Table 2.3: Commercial and Industrial Waste, UK and England, 2012 (amended)[1]

Thousand Tonnes

Source of estimate	UK	England
Returns made under the EU Waste Statistics Regulation	**47,567**	**38,976**
Reconcile Project		**43,839**

- For the returns made under the EU Waste Statistics Regulation, waste generated from commercial and industrial activities was estimated to be 48 million tonnes in 2012 in the UK, with some 39 million tonnes of this coming from England.
- The estimated waste generation from commercial and industrial economic activities from the Reconcile Project was 44 million tonnes for England in 2012.
- The difference is because Reconcile uses wet weight for sludges and dredging spoils, whilst the Waste Statistics Regulation uses dry weight.

Notes: [1] The Waste Statistics Regulation figures for UK and England were subject to minor revisions on 25 March 2015

Source: Waste Statistics Regulation return 2012, Reconcile Project
www.gov.uk/government/uploads/system/uploads/attachment_data/file/485117/UK_Statistics_on_Waste_statistical_notice_15_12_2015_update_f1.pdf - Table 4.1

Packaging in UK

Table 2.4: Packaging waste, UK, 2012 – 2013

	2012			2013			
	Total packaging waste arising (thousand tonnes)	**Total recovered/recycled (thousand tonnes)**	**Recovery / recycling rate (%)**	**Total packaging waste arising (thousand tonnes)**	**Total recovered/recycled (thousand tonnes)**	**Recovery/ recycling rate (%)**	**EU Target (%)**
Aluminium	162	62	38.5	164	71	43.4	
Steel	646	358	55.5	642	391	60.9	
Total Metal	**808**	**420**	**52.1**	**806**	**462**	**57.4**	**50.0**
Paper	3,848	3,328	86.5	3,868	3,459	89.4	60.0
Glass	2,399	1,627	67.8	2,399	1,639	68.3	60.0
Plastic	2,554	644	25.2	2,260	714	31.6	22.5
Wood	1,024	525	51.3	1,029	436	42.3	15.0
Other	23			23			
Total recycling		**6,544**	**61.4**		**6,710**	**64.6**	**55.0**
Energy from Waste		821			838	8.1	
Total	**10,655**	**7,365**	**69.1**	**10,384**	**7,548**	**72.7**	**60.0**

- Estimates of packaging waste placed on the market are reviewed on an ad-hoc basis by government and industry stakeholders and estimates of recycling rates are based on volumes of Packaging Recycling Notes reported to the Environment Agency.

Source: Defra, EA:

www.gov.uk/government/uploads/system/uploads/attachment_data/file/485117/UK_Statistics_on_Waste_statistical_notice_15_12_2015_update_f1.pdf - Table 7.1

Battery Waste

Table 2.5: Recovery rate for batteries, UK, 2010 - 2014

	Collection rate Target (%)	Collection rate (%)
2010	10.0	9.5
2011	18.0	18.0
2012	25.0	28.3
2013	30.0	32.4
2014	30.0	36.4

- The UK has been meeting its collection target for batteries since 2011.

Source: Environment Agency npwd.environment-agency.gov.uk/public/batteries/publishedreports.aspx

Hazardous Waste

Table 2.6: Hazardous waste arisings by waste sector[1]. UK. 2004 – 2012 (*Waste Prevention Metric)*

Thousand tonnes

	2004	2006	2008	2010	2012
Household	32	1,165	859	1,592	1,306
C&I	4,245	5,864	3,834	2,899	3,173
Construction	225	586	1,258	1,018	1,057
Other	418	308	367	328	395

[1] Classifications are based on NACE codes. Construction is defined as NACE code F (which includes dredging). For a list of NACE codes including in C&I, see Glossary on page 82. 'Other' waste includes waste from the mining and quarrying, and agriculture, forestry and fishing sectors – defined as NACE codes A and B

- Table 2.7 shows the amount of hazardous waste produced in the UK from 2004 to 2012.
- There have been methodological changes to the way data is calculated between 2008 and 2010, therefore 2010 and 2012 data is not completely comparable to the earlier.
- This data is updated on a 2 yearly basis so there will be an update showing 2014 data available in 2016.

Notes: Please note that whilst figures for UK arisings are reasonably robust for all years, for years prior to 2010 there were some significant methodological differences compared to later years. Readers are advised therefore to exercise caution when drawing any observations or conclusions from looking at trends which include years prior to 2010.
Source: Eurostat

Section 3: Waste Hierarchy and destination of waste

Depiction of Waste Hierarchy

Figure 3.1 Waste hierarchy

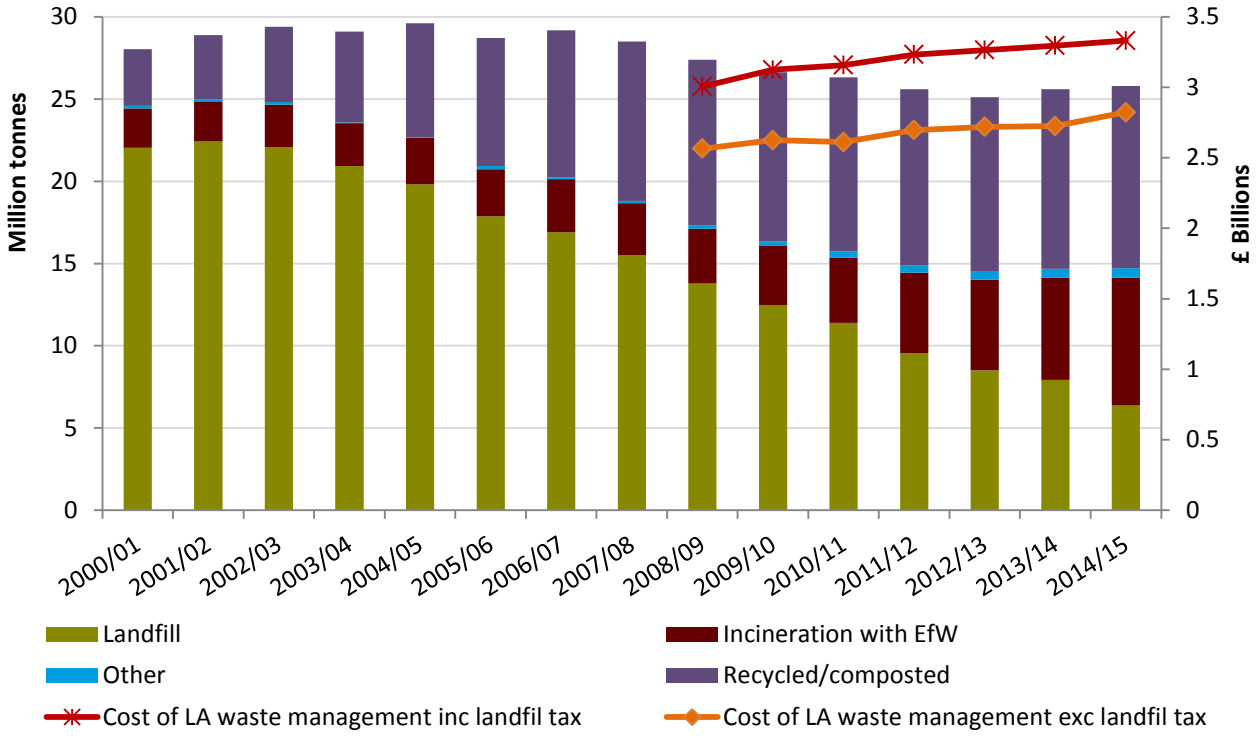
- Article 4 of the revised EU Waste Framework Directive (Directive 2008/98/EC) sets out five steps for dealing with waste, ranked according to environmental impact - the 'waste hierarchy'.
- The definitions of each of the stages can be found in Article 3 of the Directive.
- It gives top priority to preventing waste. When waste is created, it gives priority to preparing it for re-use, then recycling, then recovery, and last of all disposal (e.g. landfill).
- A very key principle in the backdrop to the hierarchy is to pursue efficient use of resource.

Source: European Commission's Community Strategy for Waste Management
www.gov.uk/government/uploads/system/uploads/attachment_data/file/69403/pb13530-waste-hierarchy-guidance.pdf

Destination of waste

Local Authority Collected Waste

Figure 3.2: Local Authority collected waste management, England, 2000/01 – 2014/15



- The total amount of waste managed by local authorities was 25.8 million tonnes in 2014/15. This is 0.7 per cent higher than 2013/14 but down 8.0 per cent on 2000/01 when the total waste managed was 28.0 million tonnes.
- Cost of local authority waste management covers net current expenditure on waste collection, recycling, waste minimisation, waste disposal (including landfill tax) and climate change costs.
- In 2014/15 the cost of local authority waste management was around £3.3 billion in England. The cost excluding landfill tax amounted to almost £3 billion.

Notes: Local authority collected waste is a combination of waste from households and waste from streets, parks and grounds and some commercial and industrial waste

Source: Defra, DCLG

Local authority waste management:

www.gov.uk/government/statistical-data-sets/env18-local-authority-collected-waste-annual-results-tables

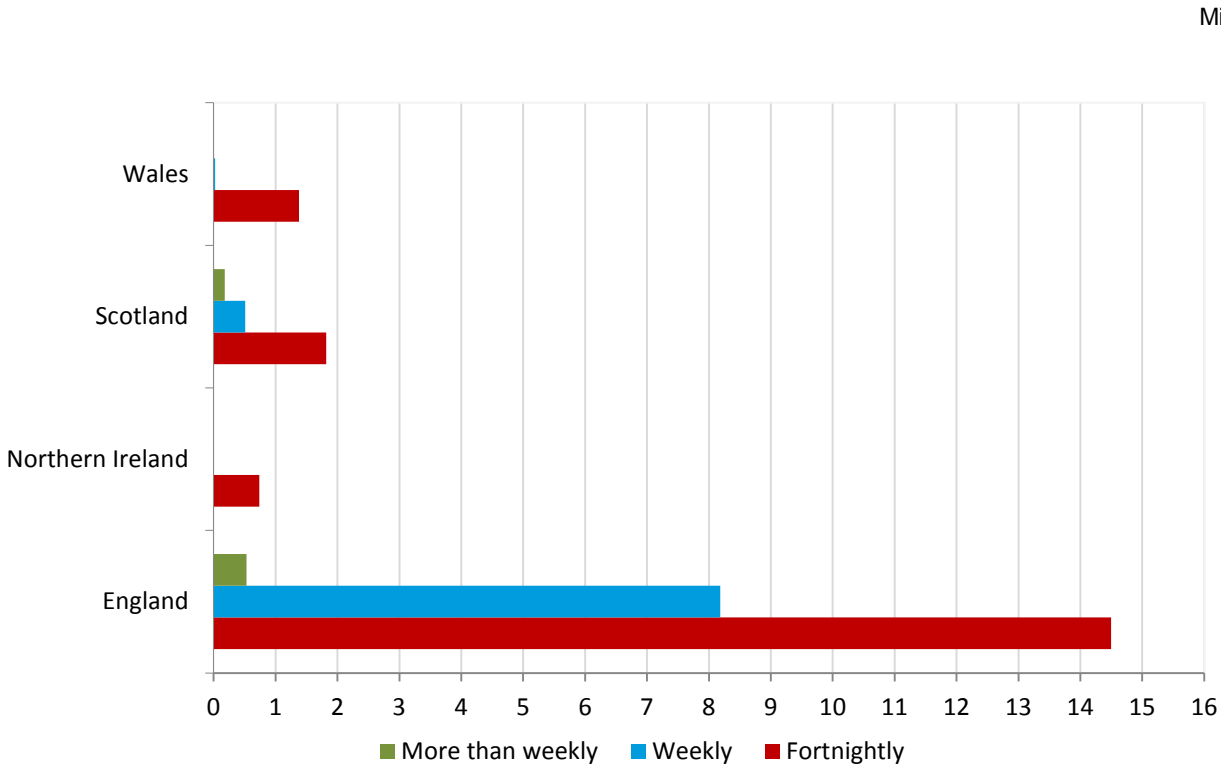
See Table 2 of the Local authority collected waste generation from April 2000 to March 2015 (England and regions) and local authority data April 2014 to March 2015

Cost of local authority waste:

www.gov.uk/government/collections/local-authority-revenue-expenditure-and-financing. See Revenue outturn data (RO5) cultural, environmental, regulatory and planning services. The cost is based on net current expenditure. The cost of LA waste without landfill tax was derived by deducting the landfill tax from the waste disposal part of the cost.

Local authority household residual waste collection schemes from kerbside

Figure 3.3: Frequency of local authorities collecting residual waste from households by household numbers, UK countries, 2014/15



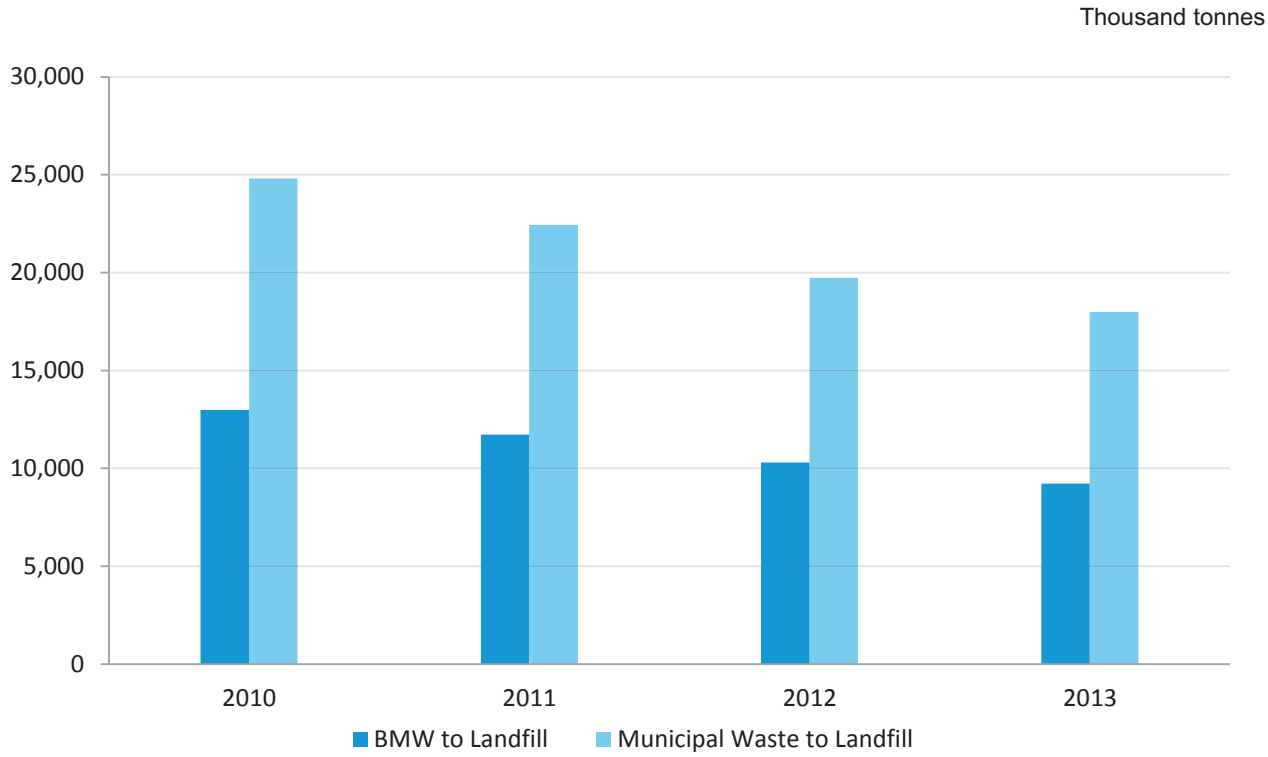
- Figure 3.3 represents WRAP's best understanding of the residual waste collection schemes offered by UK local authorities.
- Collections that are offered to a small proportion of households within a Local Authority (less than 5 per cent or fewer than 3,000 households, whichever is lowest) are not included in the analysis.
- In Northern Ireland residual waste is collected fortnightly, for all but around 1,000 households who have a weekly collection.
- In Wales it is mainly fortnightly but 22.5 thousand households have a weekly collection.
- In England and Scotland there are some authorities where collections are more regular than weekly.

Notes: In any authority a scheme may not be available to every household. Where an authority operates more than one scheme, each scheme has been included. If an authority provides a weekly and fortnightly collection, and both schemes are above the threshold, it will be counted under both frequencies so the percentages do not necessarily add up to 100 per cent.

Source: WRAP - laportal.wrap.org.uk/Statistics.aspx

Municipal Waste to landfill including Biodegradable Municipal Waste (BMW)

Figure 3.4: Municipal waste to landfill, Biodegradable municipal waste to landfill, UK, 2010 – 2013



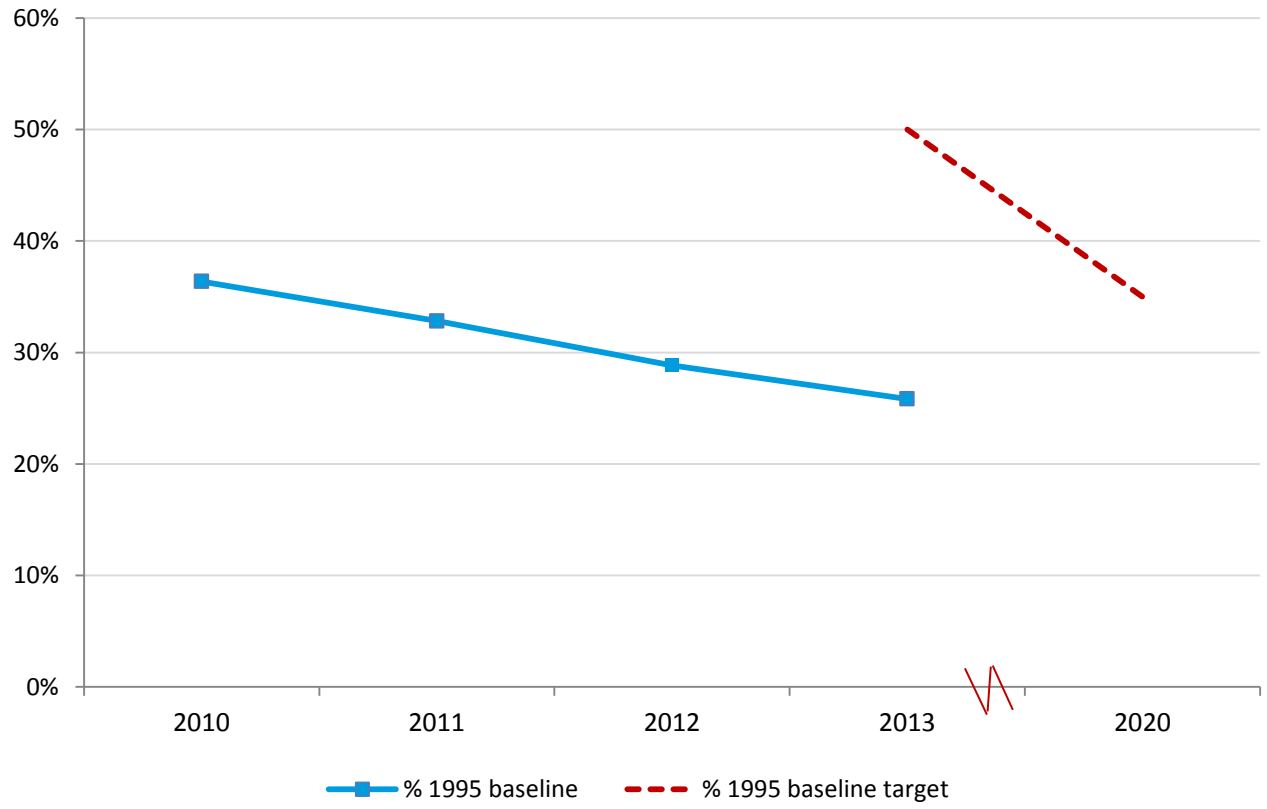
- The tonnage of municipal waste sent to landfill has decreased from 25 million tonnes in 2010 to 18 million tonnes in 2013.
- Of this municipal waste sent to landfill, 9 million tonnes was Biodegradable Municipal Waste in 2013.

Notes: Municipal waste here comprises waste from households and other waste which, because of its nature or composition, is similar to waste from households.

Source: Waste Data Interrogator, Defra Statistics
www.gov.uk/government/uploads/system/uploads/attachment_data/file/485117/UK_Statistics_on_Waste_statistical_notice_15_12_2015_update_f1.pdf - Figs 2.1 and 2.2

Biodegradable Municipal Waste to landfill in UK as % of target

Figure 3.5: Percentage of target baseline (1995) for biodegradable municipal waste to landfill, UK, 2010 – 2013 and UK target in 2013 and 2020



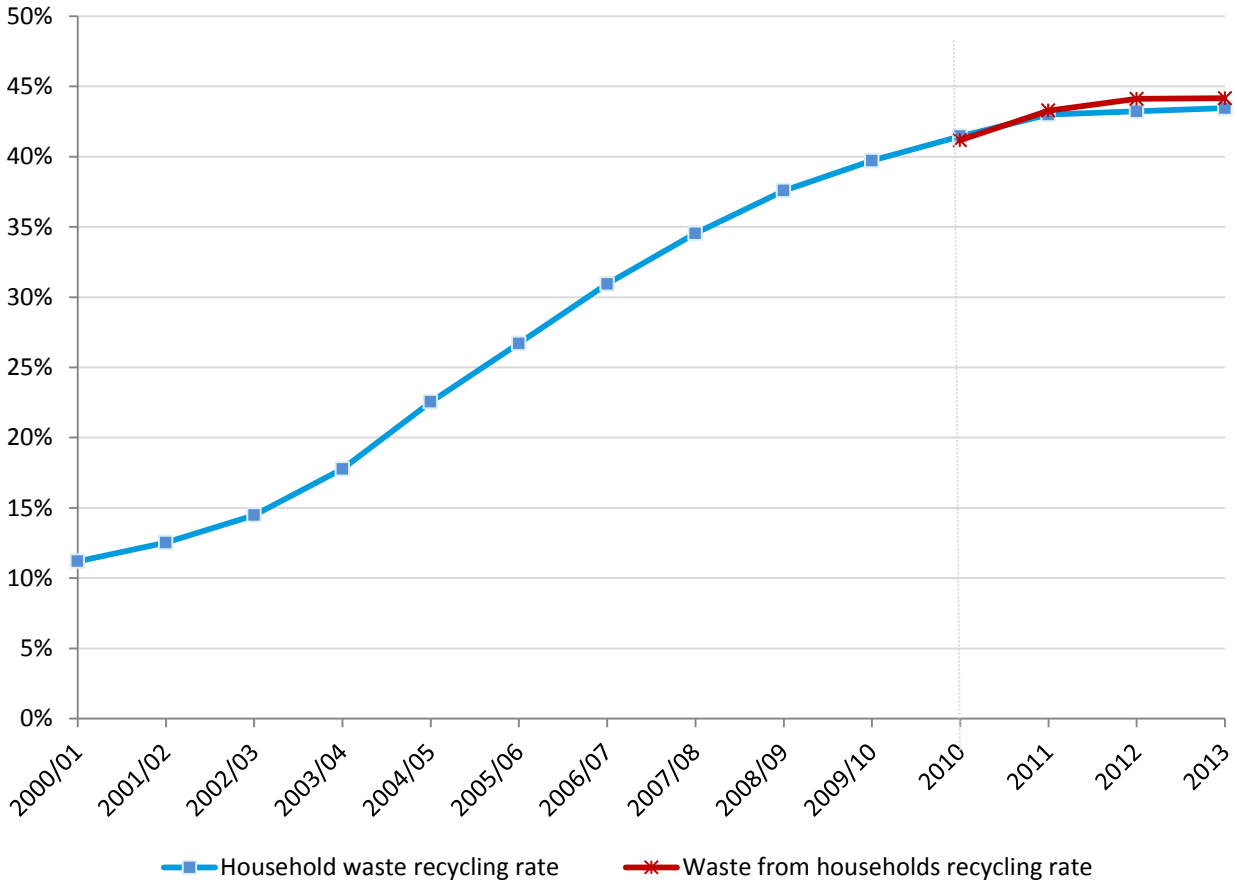
- In 2013 the amount of Biodegradable Municipal Waste sent to landfill was 26 per cent of the 36,000 tonnes sent in 1995.
- There is an EC target to contain BMW to landfill to within 50 per cent of the 1995 tonnage (baseline) by 2013 and 35 per cent by 2020. The UK is already below both of these targets.

Source: Waste Data Interrogator, Defra Statistics

www.gov.uk/government/uploads/system/uploads/attachment_data/file/485117/UK_Statistics_on_Waste_statistical_notice_15_12_2015_update_f1.pdf - Figures 2.1 and 2.2

Waste from households: recycling

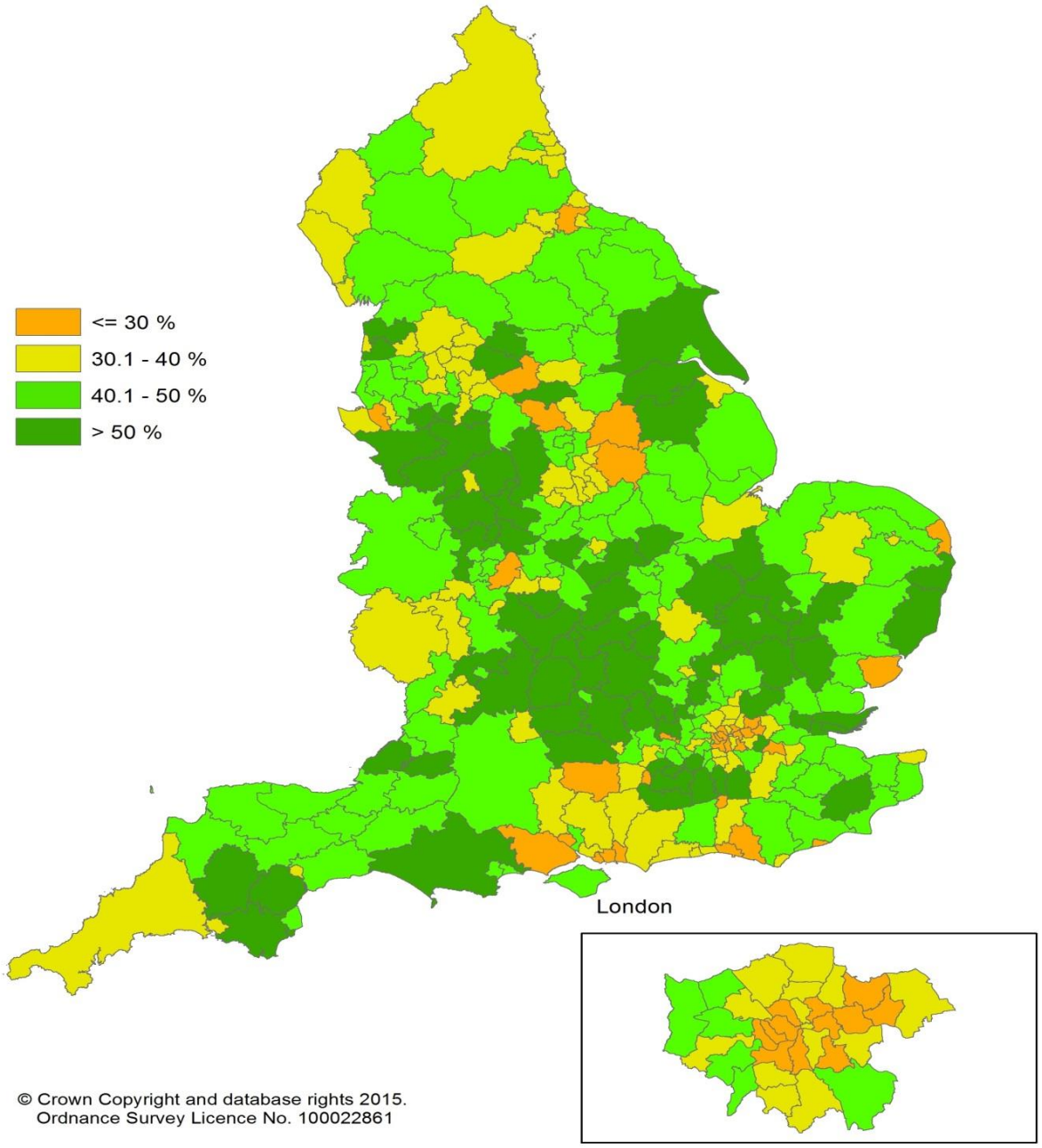
Figure 3.6: Waste from households recycling rate, England, 2000/1 to 2014



- The waste from household measure was introduced in May 2014 and is based on a calendar year. It is a narrower version of the 'Household waste' measure which was previously used and excludes waste not considered to have come directly from households, such as recycling from street bins, parks and grounds. It is therefore not possible to link the two measures over time as their definitions are different and they do not measure exactly the same thing. It has been backdated to 2010.
- The annual rate of 'waste from households' recycling for 2014 was 44.8 per cent, marginally up on the 44.2 per cent achieved in 2013. It is up by 3.0 percentage points since the 2010 calendar year.

Source: Defra, Dec 2015
www.gov.uk/government/uploads/system/uploads/attachment_data/file/481771/Stats_Notice_Nov_2015.pdf
– Figure 4

Figure 3.7: Percentage of household waste sent for recycling, reuse or composting, England, 2014/15



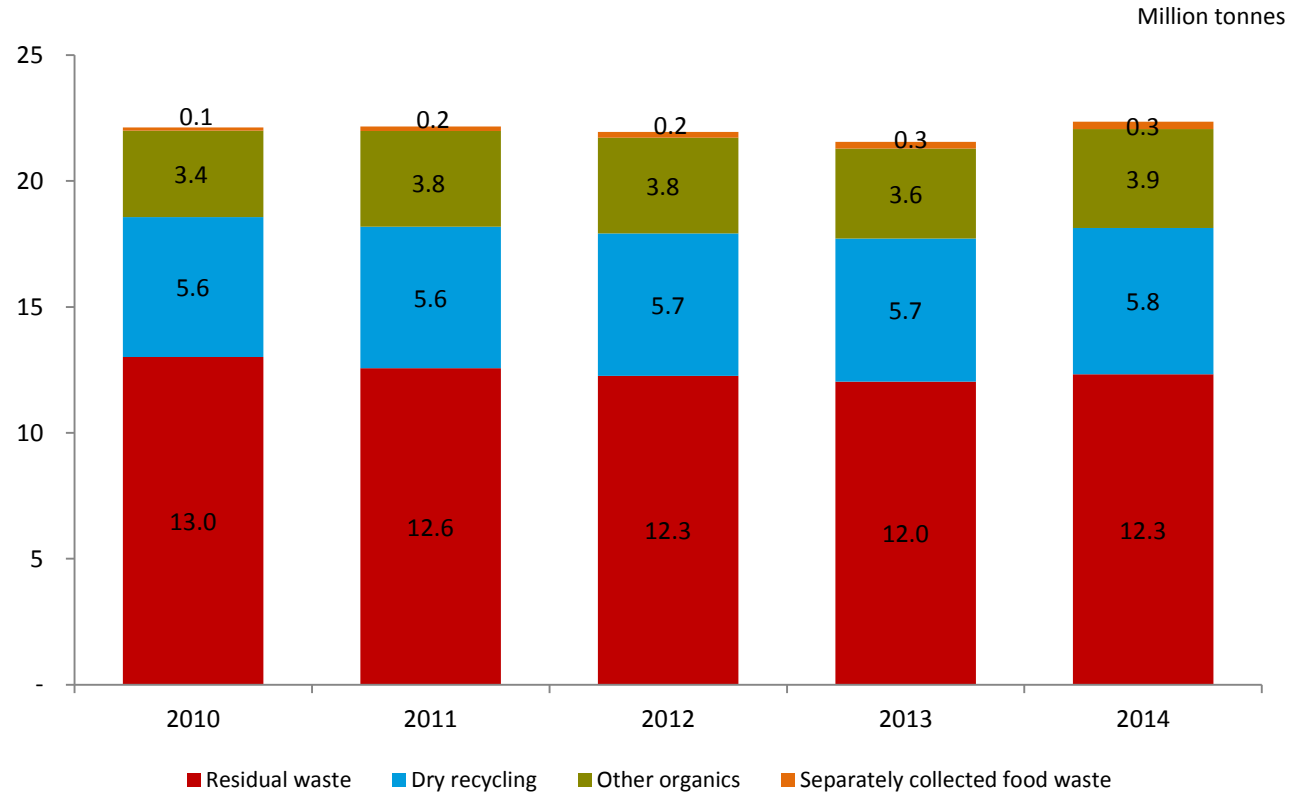
- At Local Authority level, recycling rates ranged from 14 per cent to 67 per cent.
- There is a tendency for recycling rates to be similar in adjacent areas although high and low recycling rates are spread across England.

Source: Waste Dataflow, snapshot taken in October
www.gov.uk/government/uploads/system/uploads/attachment_data/file/481771/Stats_Notice_Nov_2015.pdf - Figure 5

Section 4: Waste Composition

Composition of waste from households

Figure 4.1: Composition of waste from households, England, 2010- 2014



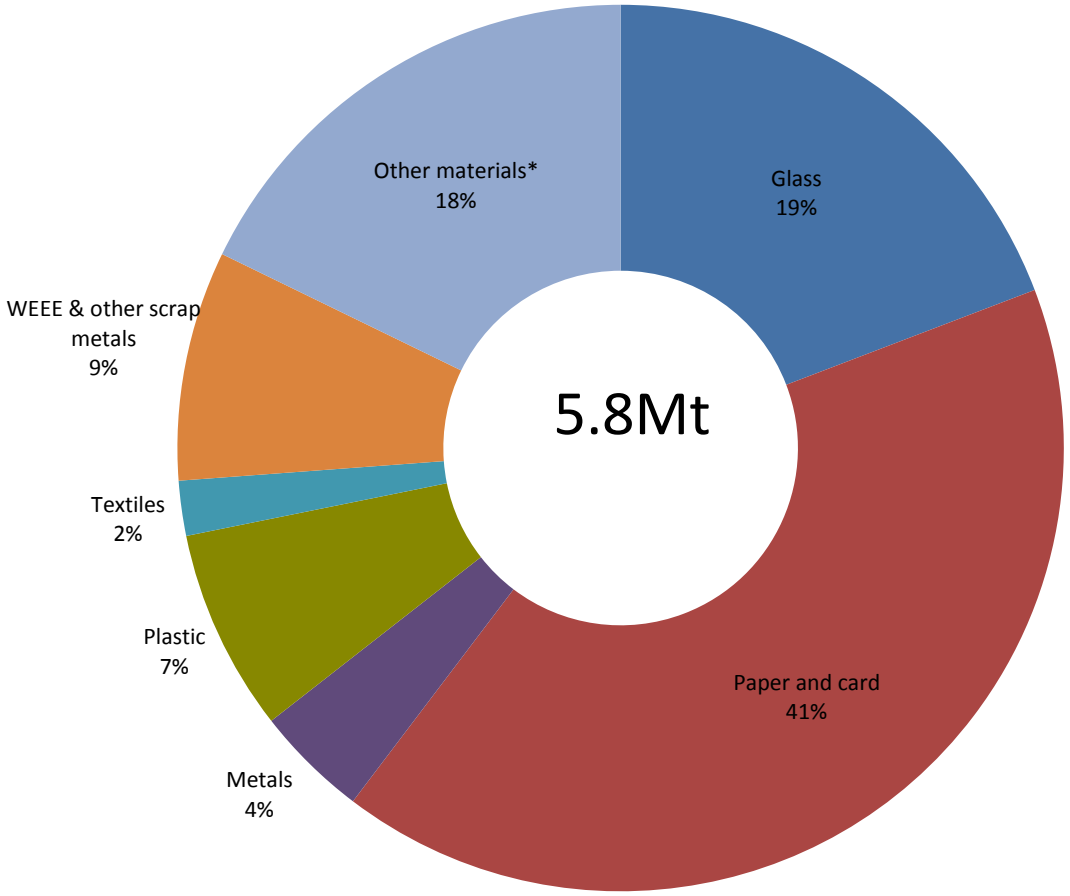
- At the aggregate level, the composition of 'waste from households' has changed very little since 2010.
- There was a 2.4 per cent increase in the amount of residual waste from households ('black bag waste') between 2013 and 2014 to 12.3 million tonnes, due to increases in waste from kerbside collections and civic amenity centres which were subsequently sent for disposal.

Notes: ***Residual waste*** includes waste from households' regular collections e.g. black bags, bulky waste, household civic amenity waste, 'other household waste' and rejects from recycling.
Dry recycling includes paper and card, glass, plastic, waste electrical and electronic equipment (WEEE), scrap metals as well as other materials.
Other organics includes green garden waste, mixed garden and food waste, wood for composting and other compostable waste

Source: WasteDataFlow
www.gov.uk/government/uploads/system/uploads/attachment_data/file/481054/Stats_Notice_Nov_2015.pdf - Figure 2

Composition of dry recycling

Figure 4.2: Composition of dry recycling England, 2014



- In 2014, approximately 5.8 million tonnes of dry recycling came from households in England.
- The composition of dry recycling has remained similar since 2010 with minimal variation across the different quarters of the year.

Notes: Dry recycling includes furniture, wood, mattresses and other recycled materials.

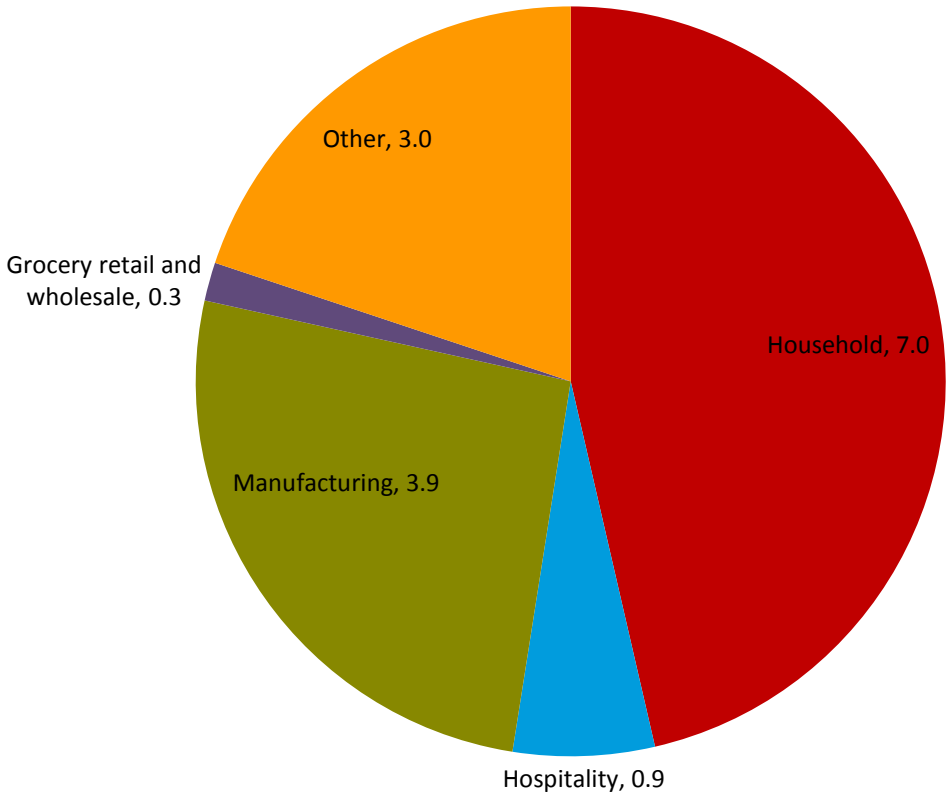
Source: WasteDataFlow
www.gov.uk/government/uploads/system/uploads/attachment_data/file/481054/Stats_Notice_Nov_2015.pdf - Figure 3

Section 5: Food Waste

UK food and drink waste through the food chain

Figure 5.1: Food and drink waste, UK, 2013

Million tonnes



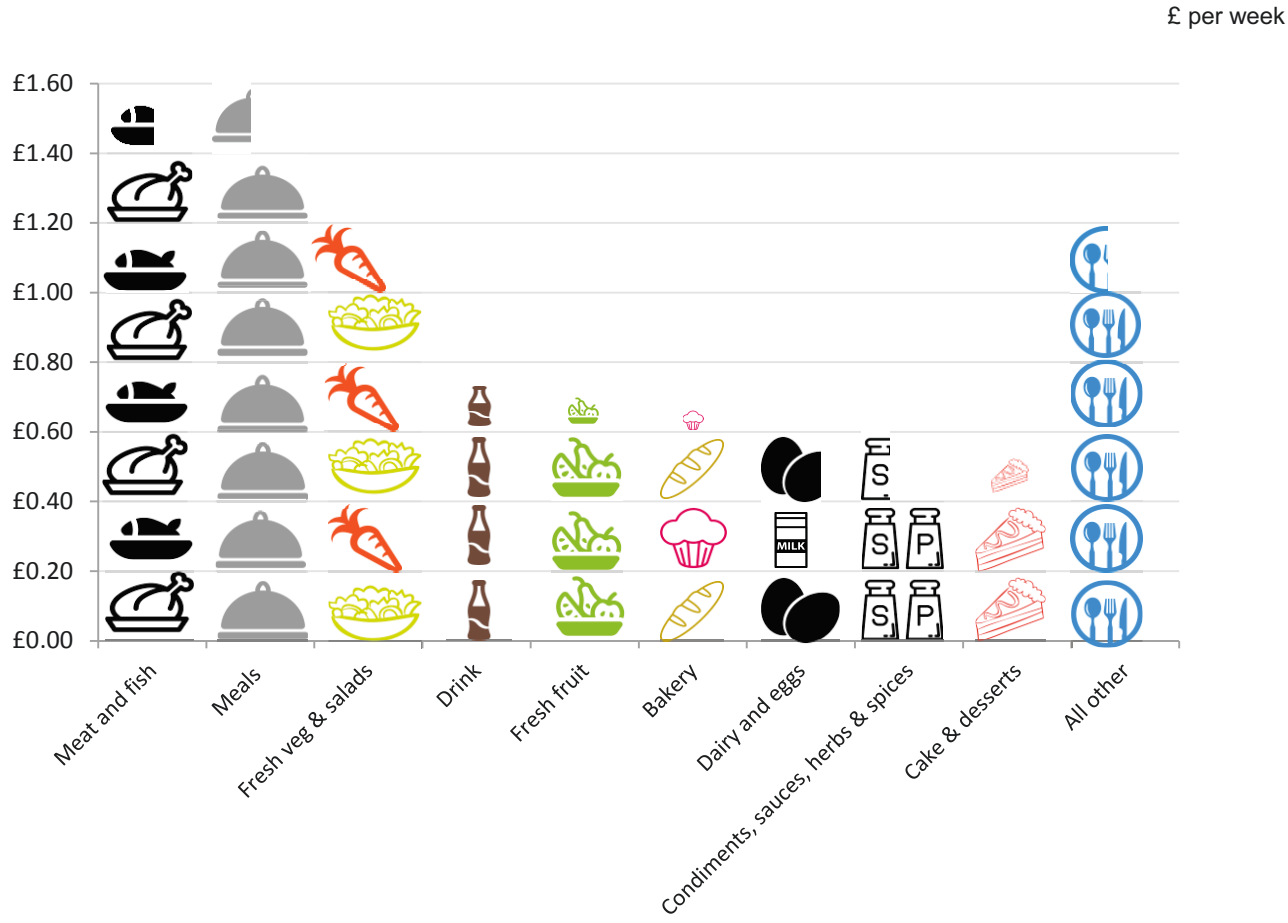
- 15 million tonnes of food and drink was wasted in the food chain in 2013. This is equivalent to around one third of the 41 million tonnes of food that is bought annually in the UK.
- The highest proportion of this waste in the food chain was wasted in households, with 7 million tonnes being thrown away in the UK in 2013, or just under half of the 15 million tonnes that is thrown away.
- Of the 7 million tonnes of household food and drink waste, 4.2 million tonnes was avoidable, 1.2 million tonnes was possibly avoidable and just 1.6 million tonnes was unavoidable.

Notes: Avoidable waste is food and drink thrown away because it is no longer wanted or has been allowed to go past its best. The vast majority of avoidable food is composed of material that was, at some point prior to disposal, edible. Possibly avoidable waste is food that some but not all people would eat, and unavoidable waste is elements that are not suitable for consumption. Further details can be found in the glossary.

Source: Handy Facts and Figures on Waste in the UK, WRAP 2013 and Household Food and Drink Waste in the UK, WRAP 2012.
www.wrap.org.uk/sites/files/wrap/UK%20Estimates%20October%2015%20%28FINAL%29_0.pdf Figure 1
www.gov.uk/government/uploads/system/uploads/attachment_data/file/461296/foodpocketbook-2015report-17sep15.pdf Figure 5.1

Cost of food purchased that is wasted

Figure 5.2: Cost of avoidable food and drink waste per household per week, UK, 2012



- The retail cost of avoidable food and drink waste from UK homes was around £9 per household per week or 14 per cent of the average £66 that households spend per week.
- Meat and fish contributed the highest cost of avoidable food and drink waste at £1.52 (17 per cent), with cake and desserts contributing the lowest cost at £0.41 (5 per cent).
- The highest percentage of food and drink wasted is bread (32 per cent), while the lowest percentage is alcoholic drinks (6 per cent)
- WRAP estimate the cost of avoidable food and drink waste is £480 per household or £12 billion per year for the UK

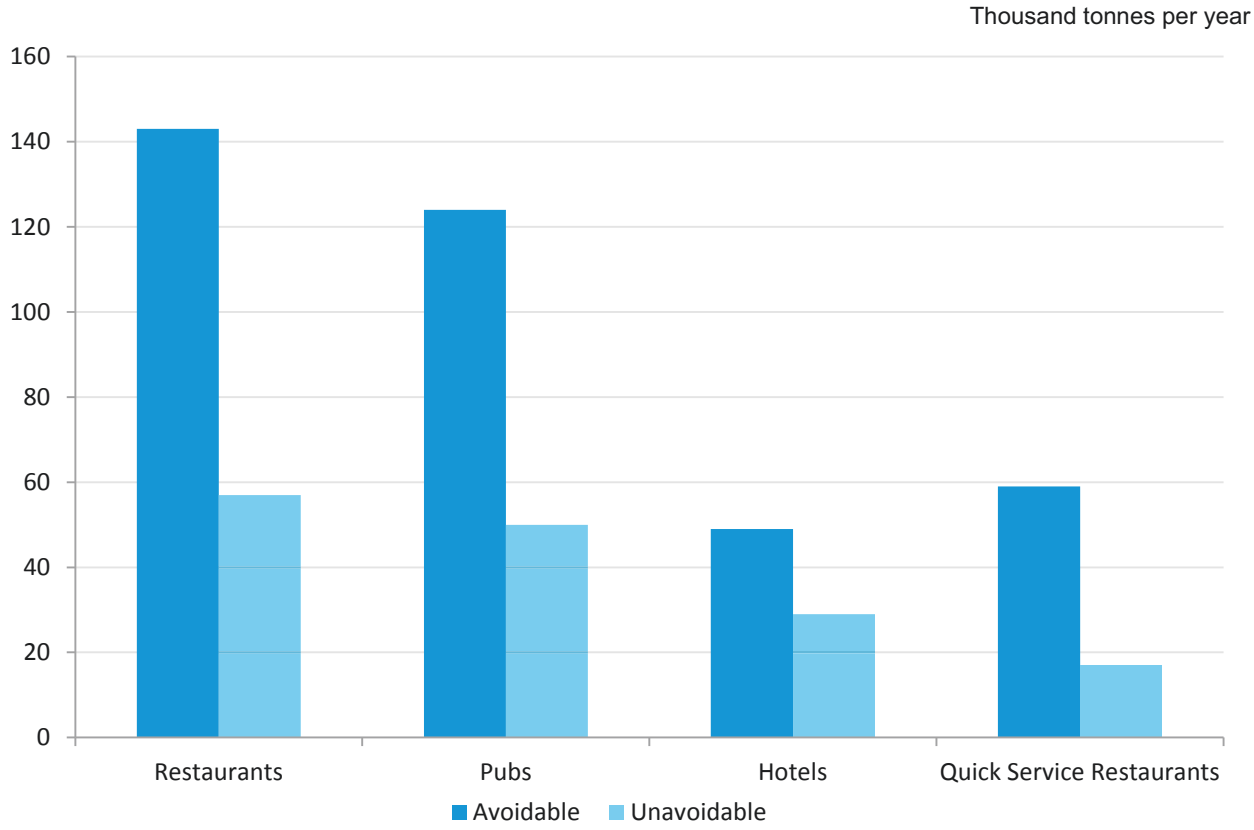
Notes: Avoidable waste is food and drink thrown away because it is no longer wanted or has been allowed to go past its best. The vast majority of avoidable food is composed of material that was, at some point prior to disposal, edible. Further details can be found in the glossary

Source: Household food and drink waste in the UK 2012, WRAP, 2013
www.wrap.org.uk/sites/files/wrap/hhfdw-2012-summary.pdf
www.gov.uk/government/uploads/system/uploads/attachment_data/file/461296/foodpocketbook-2015report-17sep15.pdf

Icons made by Freepik from www.flaticon.com

Hospitality sector food waste, UK

Figure 5.3: Food waste from the hospitality sector, UK, 2013

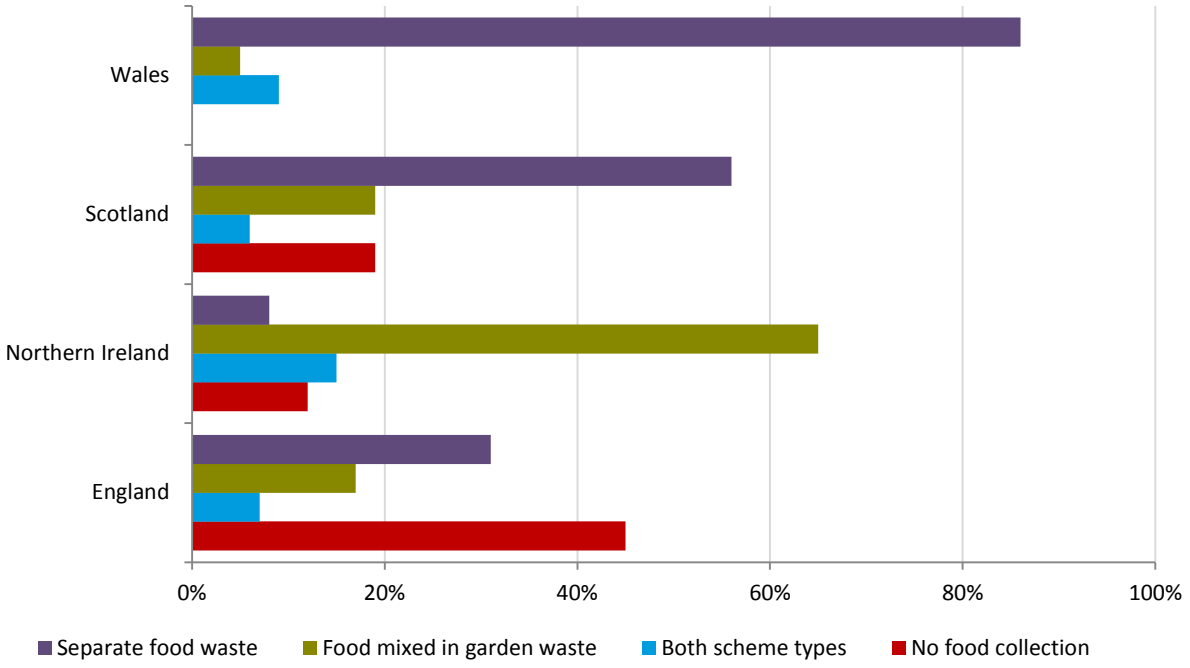


- The cost of food and drink waste from the hospitality sector was around £1.6 billion in 2013.
- Restaurants spent £0.6 billion of food and drink that was wasted.

Source: WRAP
www.wrap.org.uk/sites/files/wrap/Overview%20of%20Waste%20in%20the%20UK%20Hospitality%20and%20Food%20Service%20Sector%20FINAL.pdf Figure E1

Percentage of Local authorities collecting food waste

Figure 5.4: Percentage of local authorities collecting food waste, UK countries, 2014/15



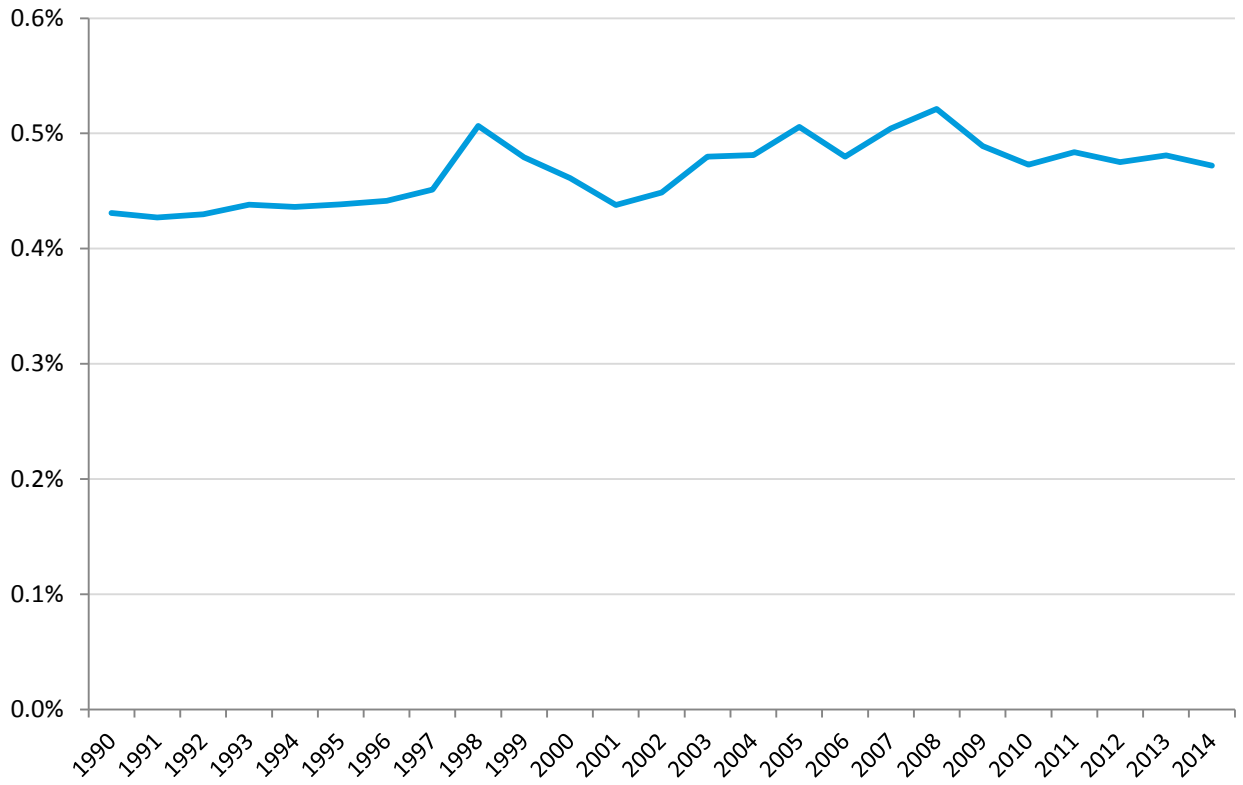
- Figure 5.4 covers the types of collection schemes operated by all authorities in the UK.
- 95 per cent of local authorities in Wales have separate food waste collections, with 5 per cent running both separate food waste and food mixed in with garden waste schemes.
- In England, Scotland and Northern Ireland some local authorities just collected food waste mixed in garden waste.

Notes: In any authority a scheme may not be available to every household.
Source: WRAP
WRAP Dry recycling performance benchmarks

Section 6 Economic characteristics of the waste management sector

Gross Value Added of the waste management sector as a percentage of the whole economy.

Figure 6.1: GVA of the waste management sector as a percentage of the economy, UK, 1990 – 2014



- Figure 6.1 uses the chain volume measure of GVA. This measure already takes price fluctuations into account.
- In 2014 the GVA that the waste sector generated showed a slight decrease (0.47 per cent of the economy's GVA).

Source: Office for National Statistics – National Accounts – GVA given in CVM
www.ons.gov.uk/economy/grossdomesticproductgdp/datasets/ukgdpolowlevelaggregates

Gross Value Added by waste management sector

Table 6.1: GVA by waste management sectors, UK, 2008 – 2014

£m (2014 prices)

	2008	2009	2010	2011	2012	2013	2014
Waste collection	2,176	2,488	2,367	2,670	2,848	2,679	2,972
Waste treatment and disposal	1,616	1,125	1,249	1,662	1,218	1,394	1,681
Materials recovery	1,977	1,310	1,960	2,032	1,844	1,453	1,633

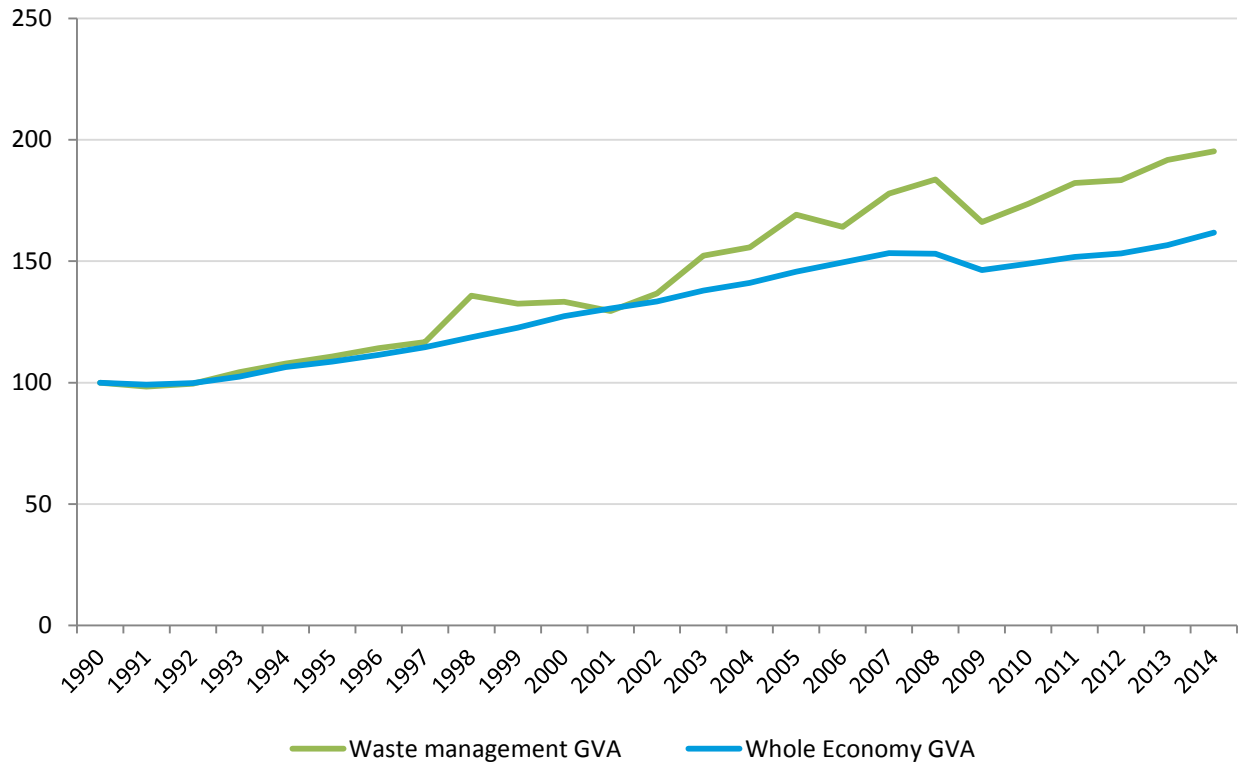
- Between 2008 and 2014 Gross Value Added (GVA) of the all waste sectors fluctuated.

Source: Office for National Statistics – Annual Business Survey
www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-387456

GVA of waste management sector

Figure 6.2: Index of GVA over time of the waste management sector and the whole economy in constant prices[1], UK, 1990 – 2014.

(1990=100)



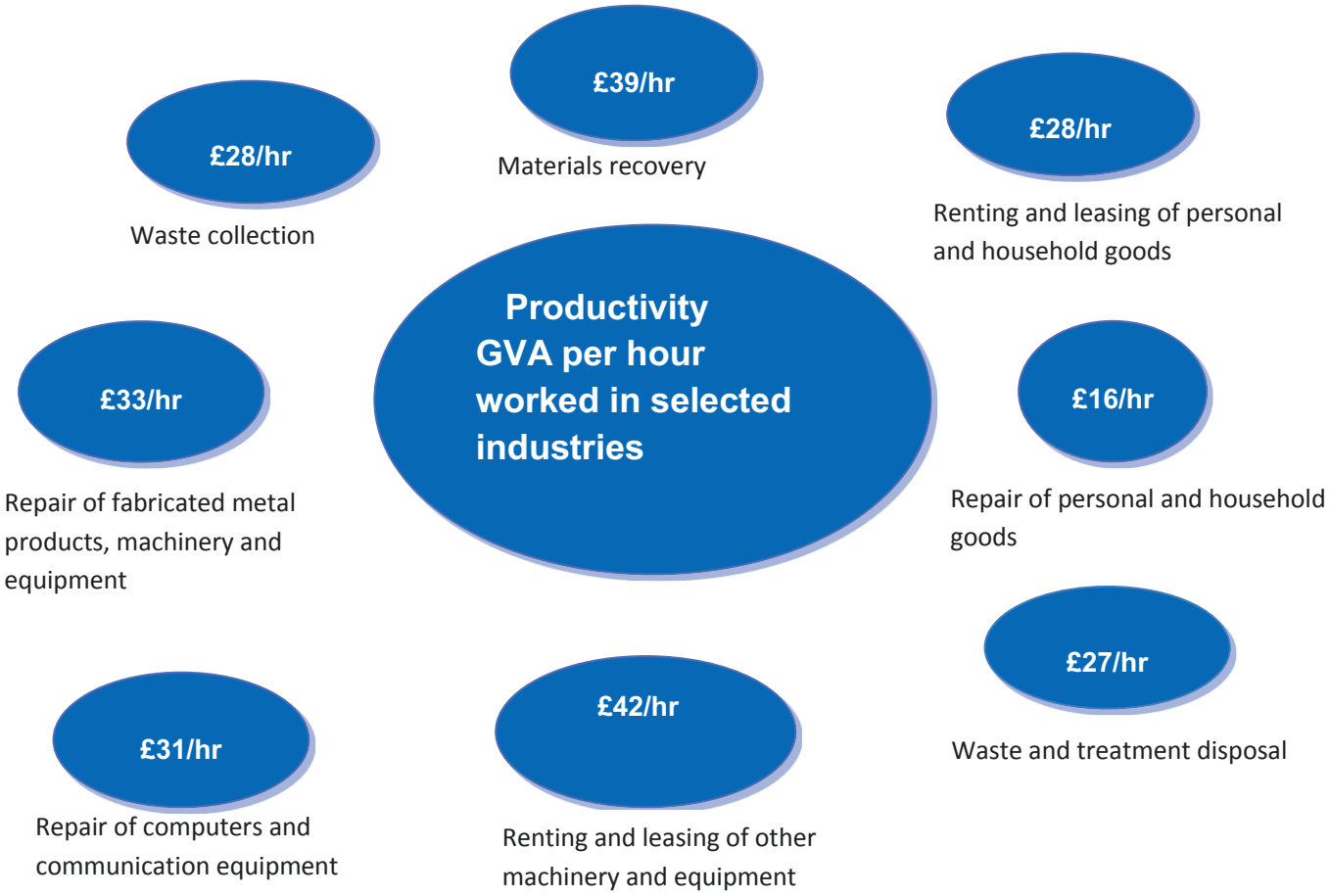
[1] – UK National Accounts Chain Value Measure (CVM) – waste sector defined by SIC 38

- Figure 6.2 uses the chain volume measure of GVA. This measure already takes price fluctuations into account.
- Between 1990 and 2014 Gross Value Added (GVA) of the waste sector fluctuated more than that of the whole economy.
- Over the past two decades the Gross Value Added of the waste and resource management sector has grown at a faster rate than the wider economy.
- However, at the start of the 2008-9 recession the GVA of the waste sector decreased considerably and, while now improving, has not yet recovered to its pre-recession level.

Source: Office for National Statistics – National Accounts - GVA given in CVM
www.ons.gov.uk/ons/rel/naa1-rd/united-kingdom-national-accounts/the-blue-book--2012-edition/tsd---blue-book-2012-dataset.html

GVA per hour of waste management sector

Figure 6.3: GVA per hour of the waste management sector in current (2012) prices, UK, 2012

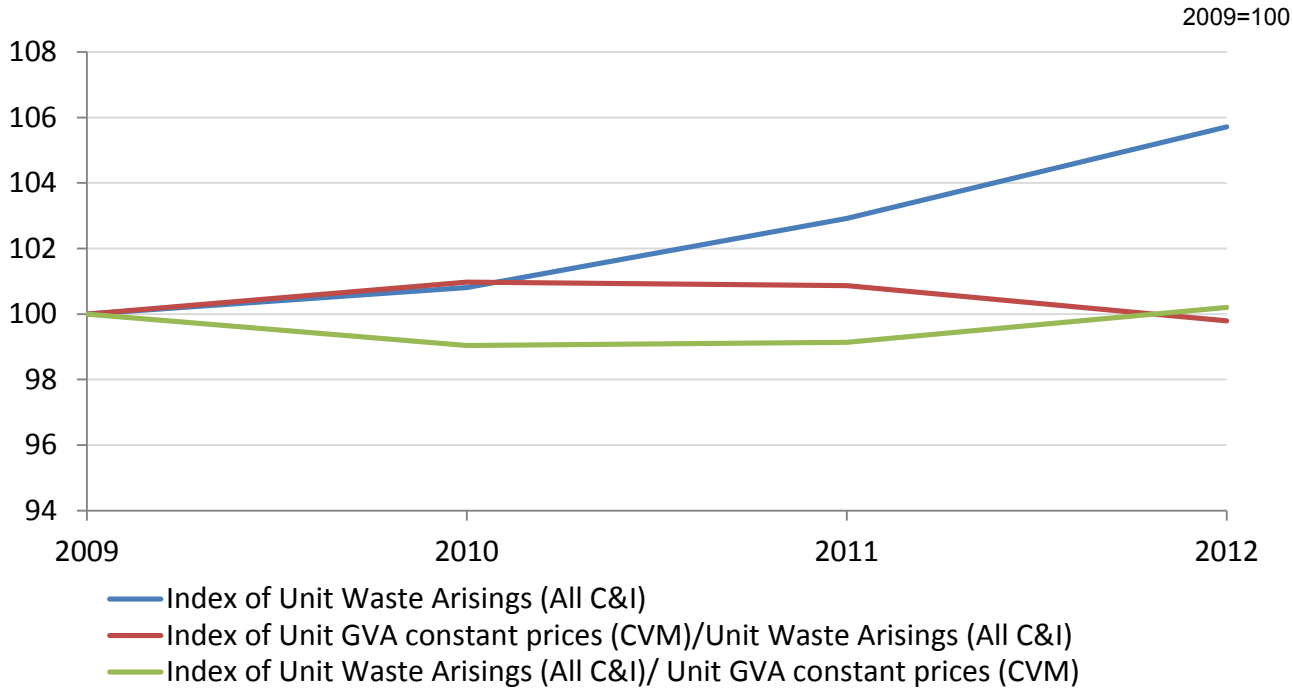


- The waste management sector's GVA per hour was £31 in 2012, the latest year for which the ONS has data. This ranked 39th out of 72 industries, i.e. the sector's labour productivity performance was middling.
- Capital intensive production industries display the highest levels of GVA per hour, and low capital-intensive, low-skilled service industries feature at the bottom of the productivity distribution. This suggests the low-skilled waste collection, low productivity aspects of the sector versus the capital-intensive MRF facilities, high productivity aspects, are netting off leading to the overall middling performance level of the sector as a whole.

Source: Office for National Statistics –-GVA given in Current (2012) Prices
www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-348837

Index of GVA and C&I waste

Figure 6.4: Graph comparing index trends in waste arisings, tonnes of waste per £ of GVA and £ of GVA per tonne of waste for the UK's commercial and industrial sectors, 2009 – 2012 (*Index of waste per unit of GVA is also a Waste Prevention Metric*)



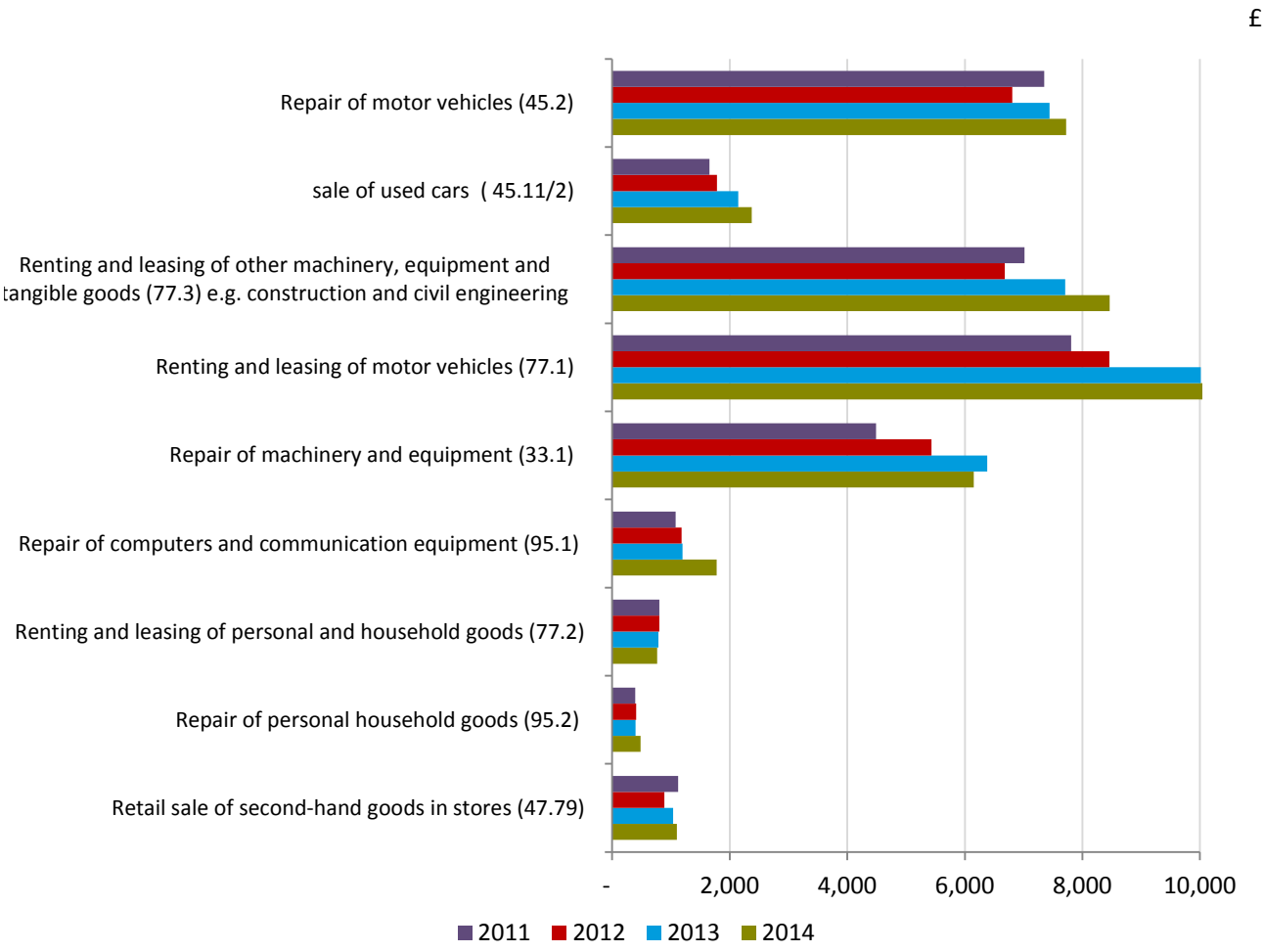
- Figure 6.4 uses the chain volume measure of GVA. This measure already takes price fluctuations into account.
- Between 2009 and 2012, waste arisings for commercial and industrial sectors as a whole, increased.
- Initially GVA per unit of waste arisings increased, but then levelled out for a year, before decreasing slightly in 2012.

Notes: The metric is based on Defra C&I data and UK National Statistics National Accounts. GVA given in CVM. Combining the two provides a measure of waste intensity per unit of output at a sectoral level.

Source: Reconcile project, 2014, ONS National Accounts, CVM
www.ons.gov.uk/ons/rel/naa1-rd/united-kingdom-national-accounts/the-blue-book--2012-edition/tsd---blue-book-2012-dataset.html
Defra, UK - Science Search_Reconcile

GVA for repair, re-use and leasing sectors

Figure 6.5: GVA for repair, re-use and leasing sectors[1], UK, 2010 – 2014 *(Waste Prevention Metric*)



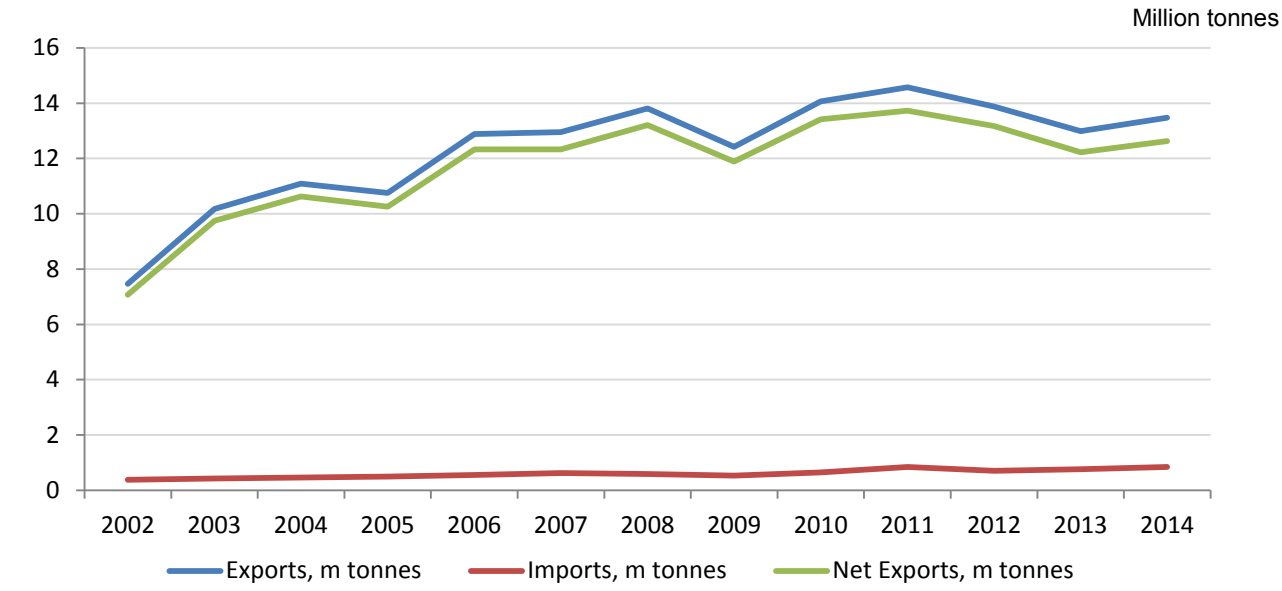
- Repair, renting and leasing of motor vehicles makes up around 50 per cent of the total GVA from the repair, reuse and leasing sector covered in the above chart.

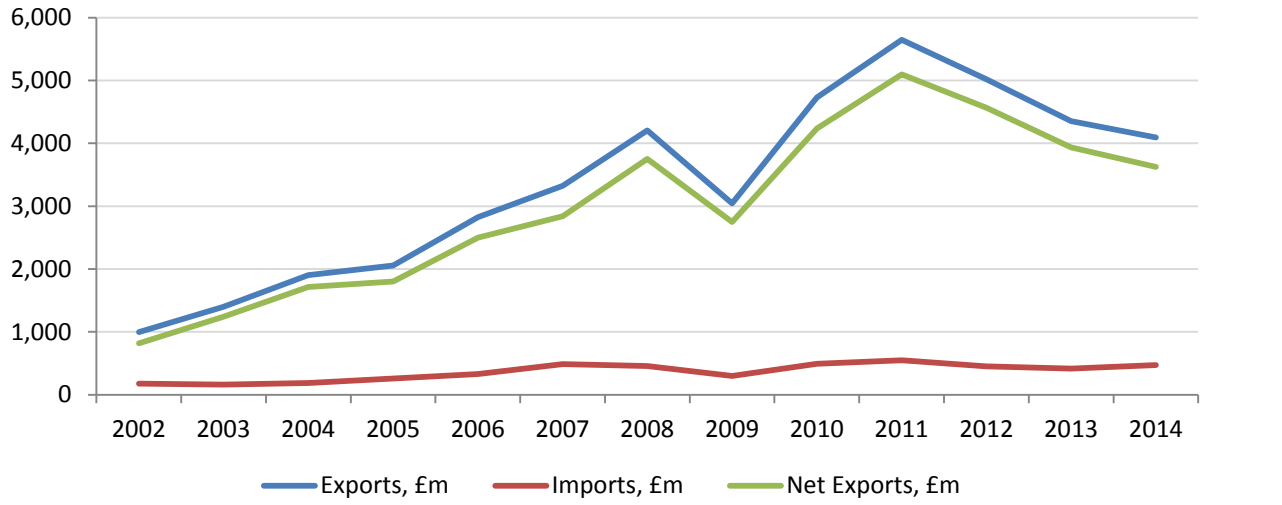
[1] GVA at basic prices

Source:
http://www.ons.gov.uk/businessindustryandtrade/business/businessservices/datasets/uknonfinancialbusinesseconomyannualbusinesssurveysectionsas

Exports of scrap materials

Figures 6.6 and 6.7: Exports, Imports and Net Exports of scrap materials in million tonnes and £m, UK, 2002 – 2014





- As Figures 6.6 and 6.7 show the UK exports more scrap materials than it imports.
- In 2014 the UK exported 13.5 million tonnes of scrap materials, worth over £4 billion.
- In 2014 there was a small increase in the tonnage of all scrap materials exported, but also a decrease in the monetary value of these exports.

Notes: Scrap materials - recyclable materials left over from product manufacturing and consumption, which has a monetary value.
Included here is: textiles, glass, rubber, plastic, wood, paper, copper, aluminium, nickel, lead, zinc, tin and ferrous metals
Source: WRAP. HMRC Trade database
www.uktradeinfo.com/Pages/Home.aspx

Exports of Refuse-Derived Fuel

Table 6.2: Exports of Refuse-Derived Fuel (RDF) from England and Wales, 2010 - 2014

Thousand Tonnes

	2010	2011	2012	2013	2014
Export of refuse – derived fuel	9	250	961	1,799	2,374

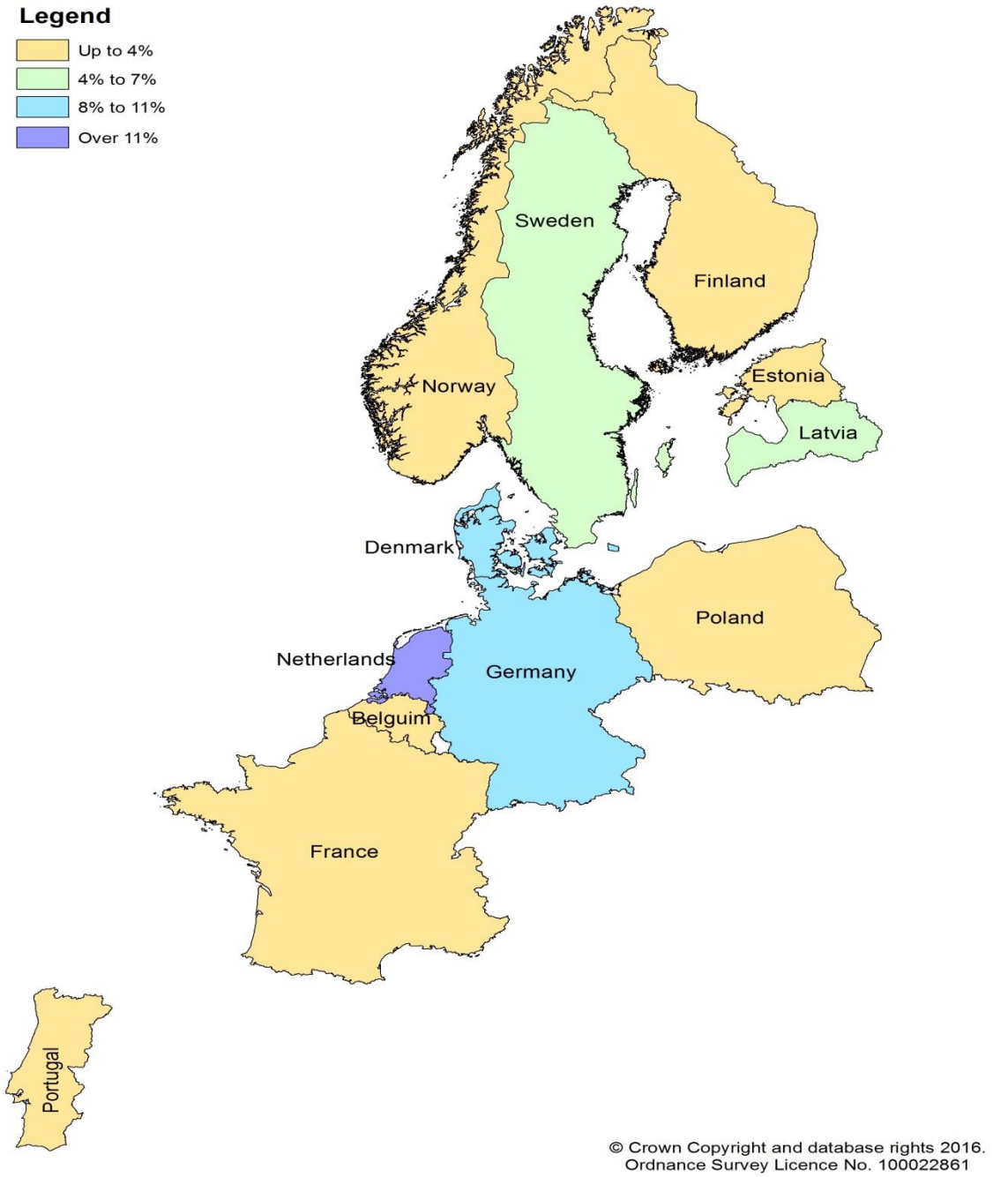
- Refuse derived fuel consists of residual waste that is subject to a contract with an end-user for use as a fuel in an energy from waste facility. The contract must include the end-user's technical specifications relating as a minimum to the calorific value, the moisture content, the form and quantity of the RDF[1].
- Exports of refuse derived fuel to energy from waste facilities elsewhere in the European Union have increased dramatically in recent years as it becomes a more favoured management route for waste.

[1] This is a new definition for RDF in England that will be trialled with industry for a six month period during 2016. Following the trial, a decision will be made on the permanent introduction of the definition

Notes: There were no exports prior to 2010.

Source: Environment Agency.
www.geostore.com/environment-agency/WebStore?xml=environment-agency/xml/ogcDataDownload.xml
International Waste Shipments

Figure 6.8: Destination of RDF exports from the UK, 2014



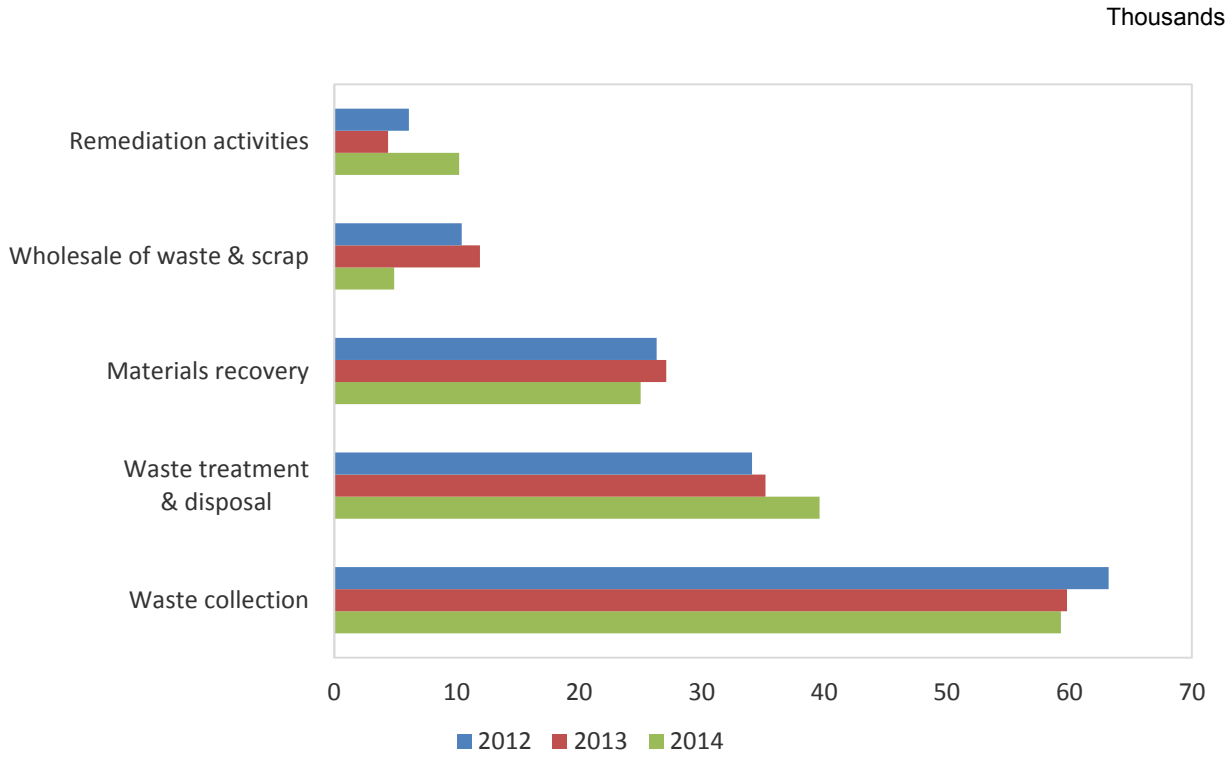
Notes: There were no exports prior to 2010.

Source: Environment Agency.
www.geostore.com/environment-agency/WebStore?xml=environment-agency/xml/ogcDataDownload.xml - International Waste Shipments

Employees in the waste sector

Employees in the waste sector, GB

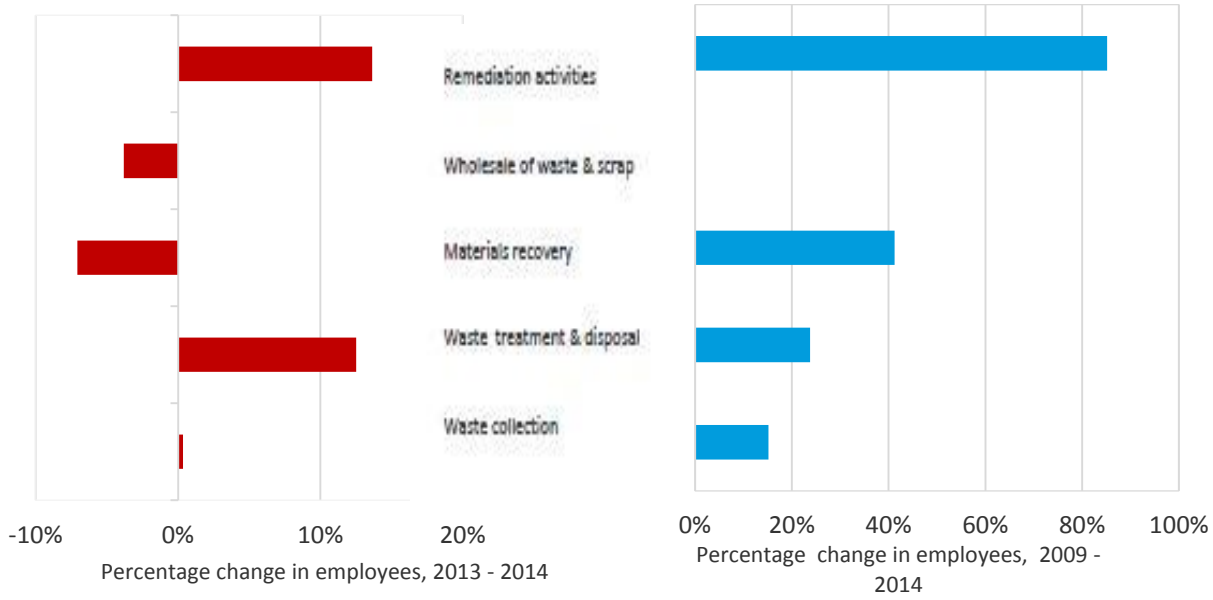
Figure 6.9: Employees in the waste sector, GB, 2012 – 2014



- Total number of employees in the waste industry covers both full time and part time employees, from the private and public sectors.
- The waste collection industry covers employees in both hazardous and non-hazardous waste. The materials recovery industry covers both dismantling of wrecks and also recovery of sorted materials.
- The waste treatment and disposal industry also covers hazardous and non-hazardous waste. Although the number of employees in this sector has increased this is due to an increase in the number of employees in the non-hazardous area of this industry
- In 2014, 2 out of the 5 sectors experienced increases in the number of employees compared to 2013.
- Employees data presented are estimated and subject to standard errors, therefore should be treated with caution.

Source: ONS
Industry (2, 3 & 5 - digit SIC) - Business Register and Employment Survey (BRES): Table 2 - Office for National Statistics
Table2: Annual employee and employment estimates for GB and UK in September 2014 split by 2,3 and 5 digit SIC codes (SIC2007). Results given by full-time/part-time and public/private splits.

Figure 6.10: **Percentage change in employees in the waste industry in Great Britain, between 2009-2014 and 2013-2014**



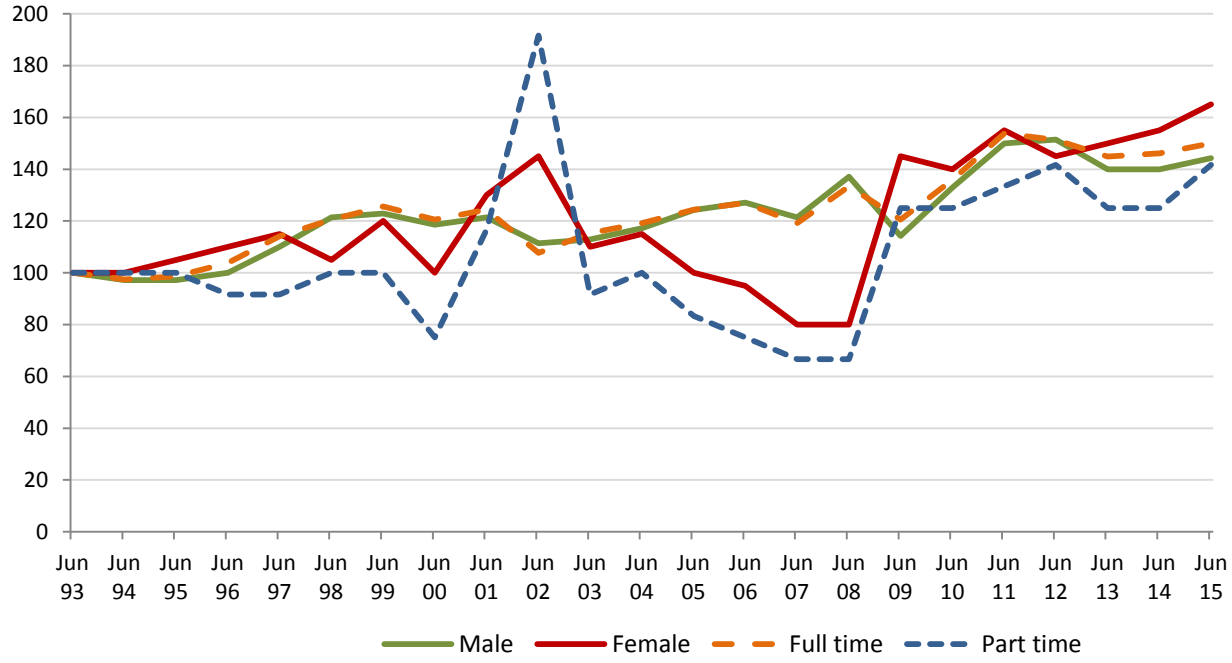
- Figure 6.10 is based on the percentage growth in the number of employees in the waste industry between 2009 - 2014, and 2013 - 2014.
- The percentage growth covers both full and part time employees in both public and private sectors of the waste industry.
- Between 2009 and 2014, all sectors within the waste industry experienced increases in employment numbers except the wholesale of waste and scrap.
- The largest increase was employment was in the Remediation activities (eighty five per cent).
- Between 2013 and 2014 employee numbers in the Materials recovery and wholesale of waste and scrap sectors decreased. The increase in numbers in the other three sectors led to an overall increase in numbers within the industry.
- Employees data presented are estimated and subject to standard errors, therefore should be treated with caution.

Source: ONS
Industry (2, 3 & 5 - digit SIC) - Business Register and Employment Survey (BRES): Table 2 - Office for National Statistics

Employees in the waste sector, UK

Figure 6.11: Employees in the waste sector, UK, 1993 – 2015.

(1993 = 100)



- Figure 6.11 covers all employee jobs in both public and private sectors of the waste industry in the UK excluding the Wholesale waste & scrap sector.
- Data is based on June series of each year and covers full and part time jobs as well as number of male and female jobs in the waste industry.
- The index for male jobs (both part time and full time) is very similar to that of full time jobs and has been steady over the years. While the index for female jobs (also covering full and time) follows similar index pattern to that of part time jobs.
- Part time jobs in the waste industry peaked in 2002 mostly due to a sharp increase in the female part time jobs in June 2002 which increased by 78 per cent from the previous year. Part time male employment increased by 40 per cent within the same period (not shown).
- Employees data presented are estimated and subject to standard errors, therefore should be treated with caution.

Source: ONS

Industry (2, 3 & 5 - digit SIC) - Business Register and Employment Survey (BRES): Table 2 - Office for National Statistics

Section 7: Waste Infrastructure

Permitted estate at end of 2014, England

Table 7.1: Permitted estate at the end of 2014, England

Waste management method	Sites permitted at end 2014	Sites that accepted waste in 2014	Million tonnes managed in 2014
Landfill	493	338	41.3
Transfer	3,149	2,383	46.7
Treatment	2,545	1,896	57.4
Metal recycling	2,534	1,290	13.6
Incineration	134	74	8.6
Use of waste	240	143	2.3
Land disposal	287	181	17.1
Total	**9,382**	**6,305**	**187.0**

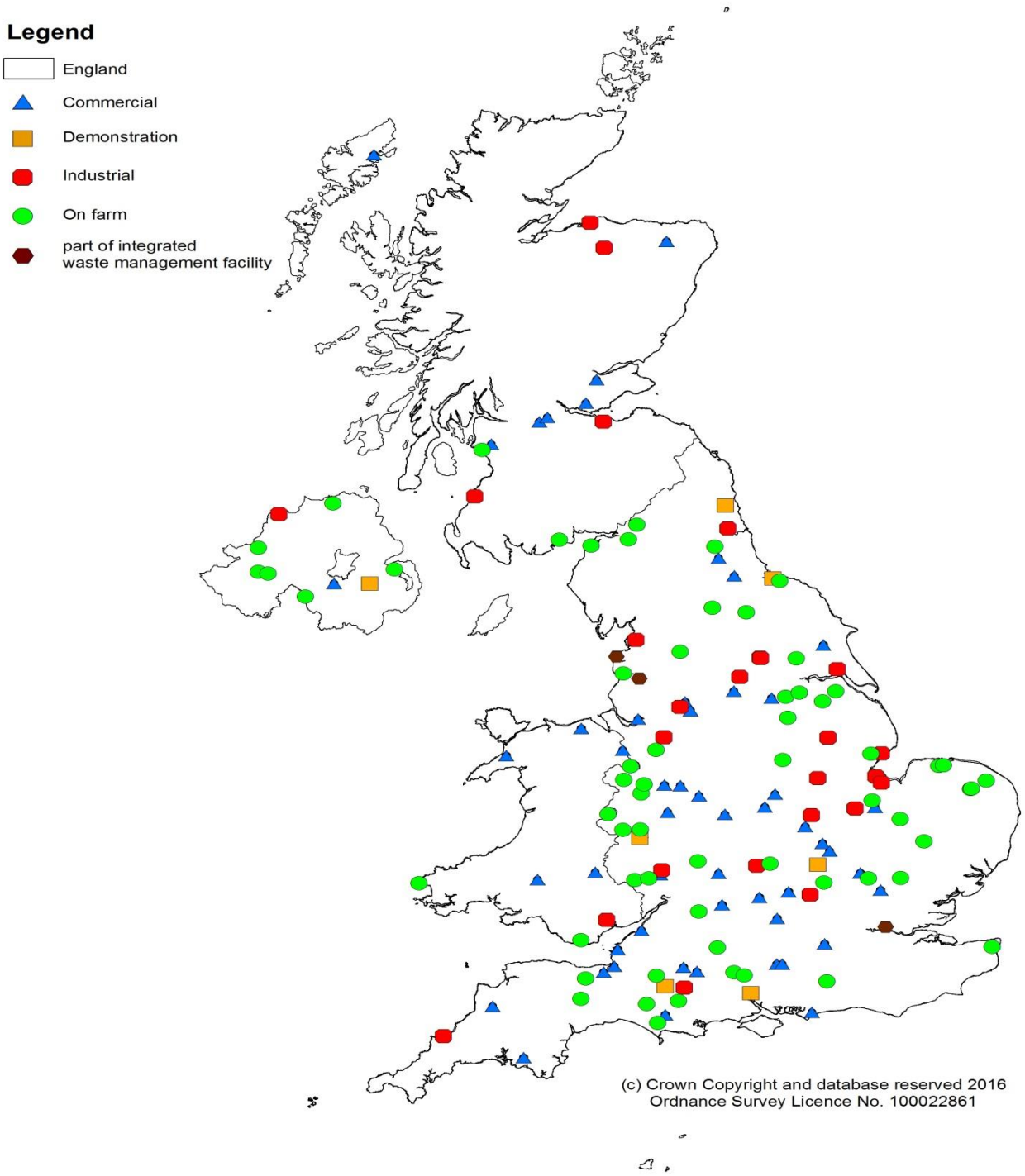
- In 2014 there were around two-thirds of permitted sites accepting waste.
- Three quarters of permitted Transfer sites were accepting waste in 2014, whilst only half of metal recycling sites accepted waste.

Notes: There is a possibility of waste being double-counted because an item of waste can pass through more than one facility
This data is based on permitted waste site monitoring returns. Some sites may not have submitted their returns in 2014 but may have accepted waste.

Source: Environment Agency, Waste management 2014
www.gov.uk/government/uploads/system/uploads/attachment_data/file/465422/Waste_management_2014_in_England_-_Summary.pdf

Anaerobic digestion

Figure 7.1: Anaerobic Digestion sites, UK, 2015

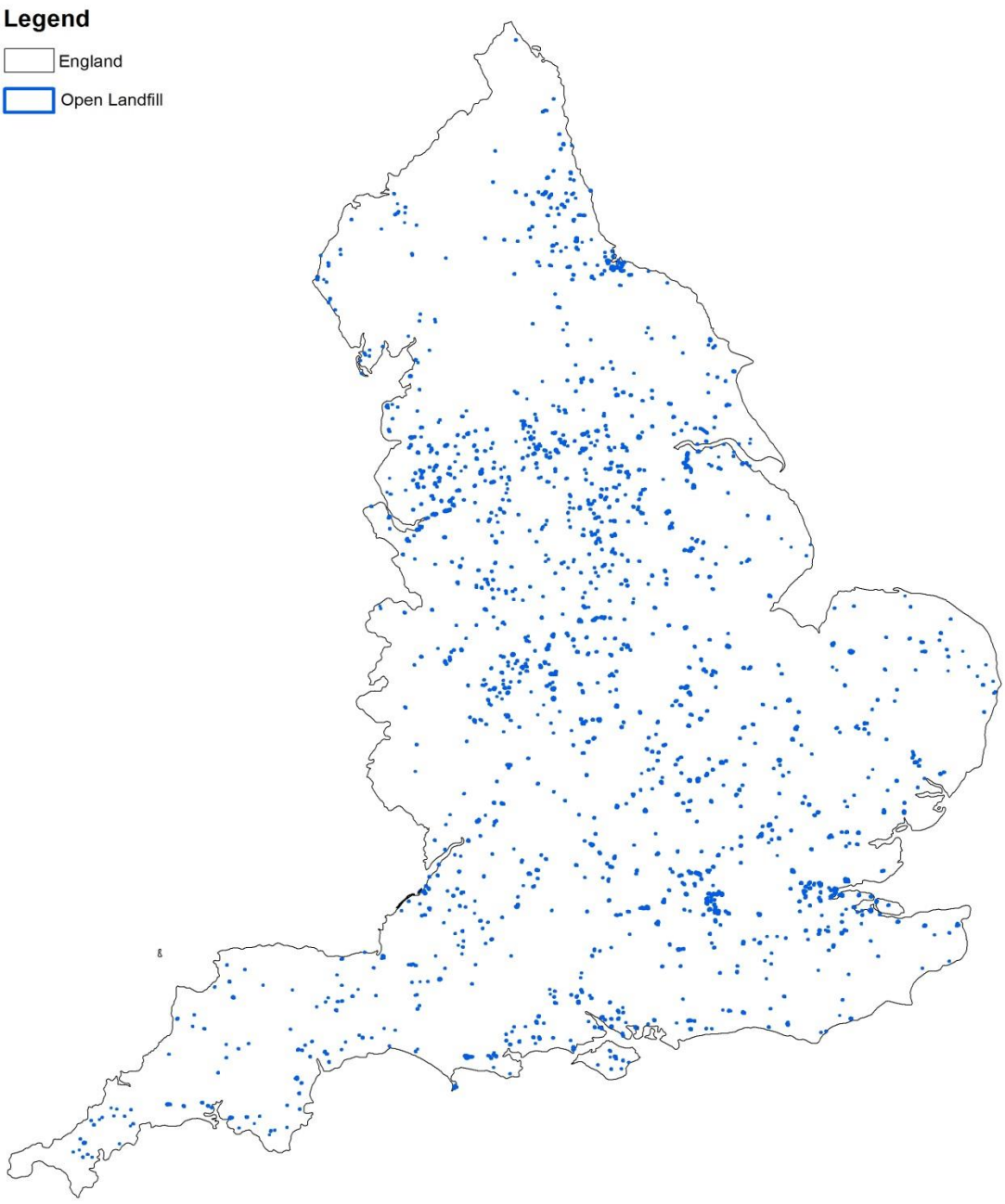


- As at 28h February 2015, there were 152 operational anaerobic digestion sites.

Source: www.wrap.org.uk/content/operational-ad-sites

Landfill sites

Figure 7.2: Permitted Waste sites (landfill sites that are currently authorised by the Environment Agency under Environmental Permitting Regulations), England, 2014

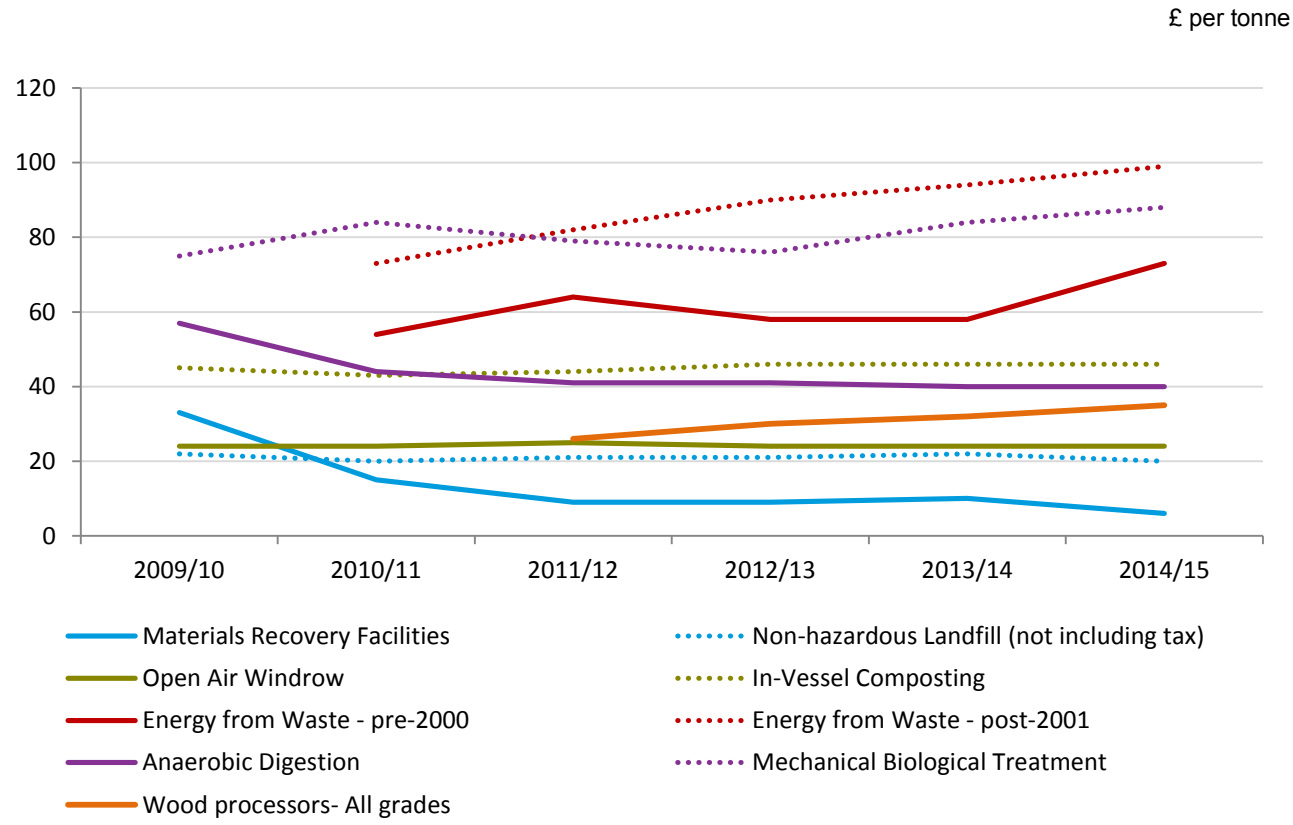


(c) Crown Copyright and database reserved 2015
Ordnance Survey Licence No. 100022861

Source: Environment Agency
www.geostore.com/environment-agency/WebStore?xml=environment-agency/xml/ogcDataDownload.xml

Gate Fees

Figure 7.3: Median Gate Fees for various waste streams, UK, 2009/10 – 2014/15



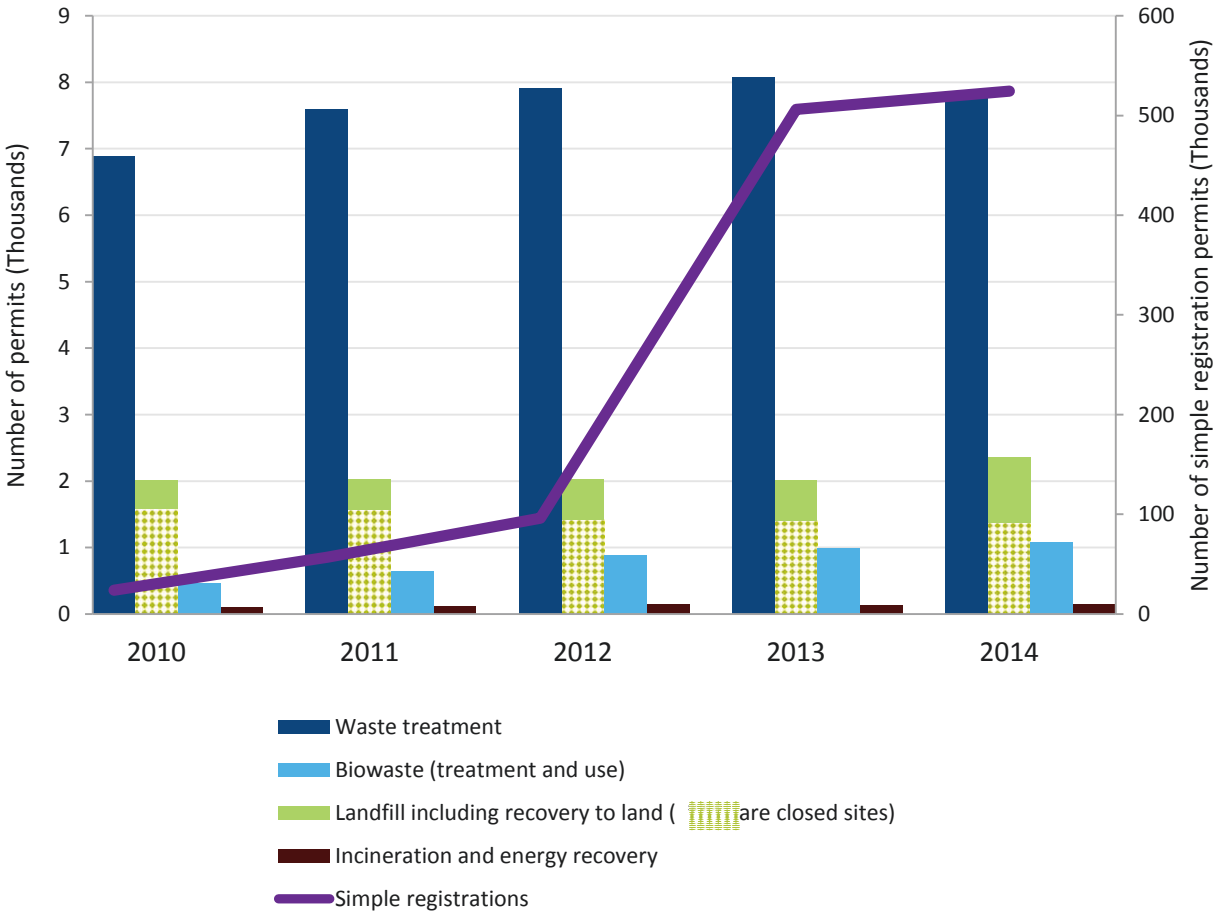
- Gate Fees for non-hazardous landfill are shown excluding landfill tax, which pushes the median cost per tonne to over £100. This additional tax would make energy from waste a preferable method.
- Materials Recovery Facilities have the lowest gate fees, but they also have the largest range of gate fees (-£43 to £86).
- Anaerobic Digestion and In Vessel Composting sites would be competing for the same waste types.
- Figure 7.3 shows Anaerobic Digestion to have a lower median price, but they have similar ranges of prices.

Notes: Energy from Waste – pre- 2000 are plants built before 2000, which were built in a different way to those built post-2000. Operating costs tend to be lower in the 'older' facilities.

Source: WRAP
www.wrap.org.uk/sites/files/wrap/Gate_Fees_Report_2013_h%20(2).pdf

Waste Management Infrastructure, England.

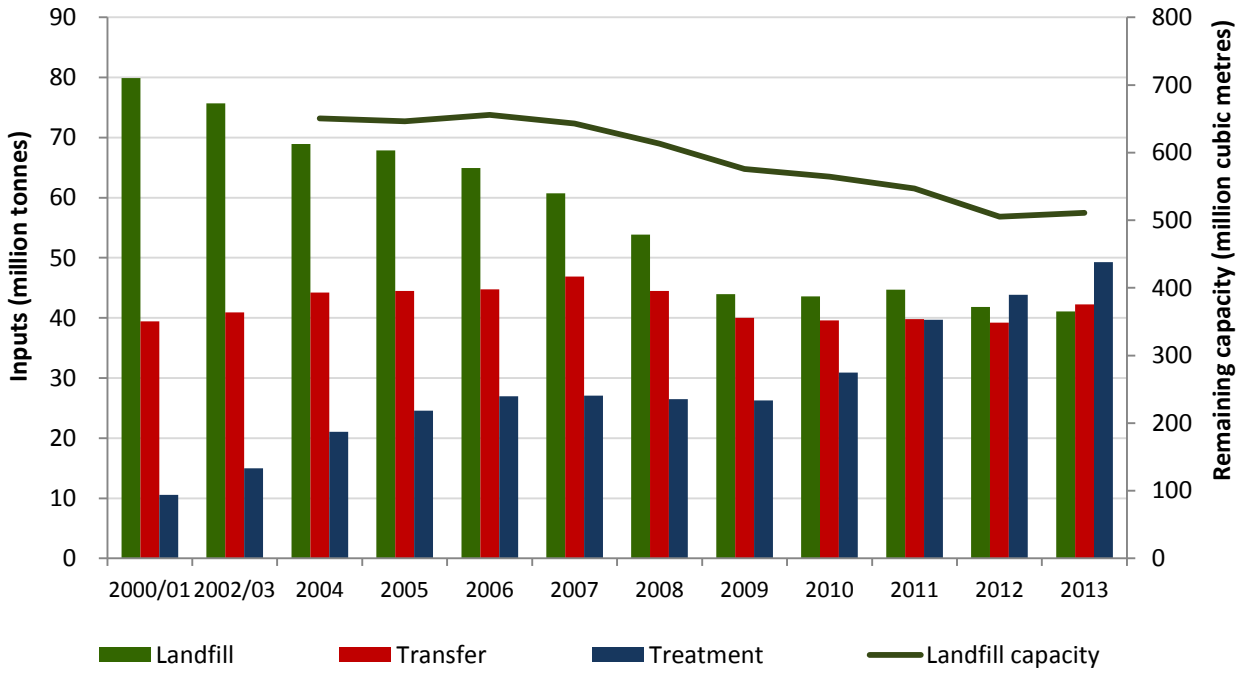
Figure 7.4: Number of waste sector permits, England, 2010 – 2014



- The waste industry in England holds over 11,000 Environmental Permitting Regulations (EPR) permits issued by the Environment Agency; 81 per cent of all EPR permits.
- The number of permitted waste facilities increased by 21 per cent between 2010 and 2014. The increases are mostly in the waste treatment and biowaste sectors.
- Simple waste registrations increased significantly in 2013 because the transitional requirements for agricultural exemptions ended and many farmers registered new simple waste registrations in the middle of that year.

Notes: Sites can hold more than 1 permit
Treatment includes composting and recycling
Source: Environment Agency
www.gov.uk/government/uploads/system/uploads/attachment_data/file/463507/LIT_10126.pdf

Figure 7.5: Waste Management Throughput and Capacity, England, 2000/01 – 2013



- In recent years more waste has been re-used and recycled, and less landfilled.
- All sites with an EPR permit recovered 59 per cent of their waste in 2013, compared to 39 per cent in 2000.

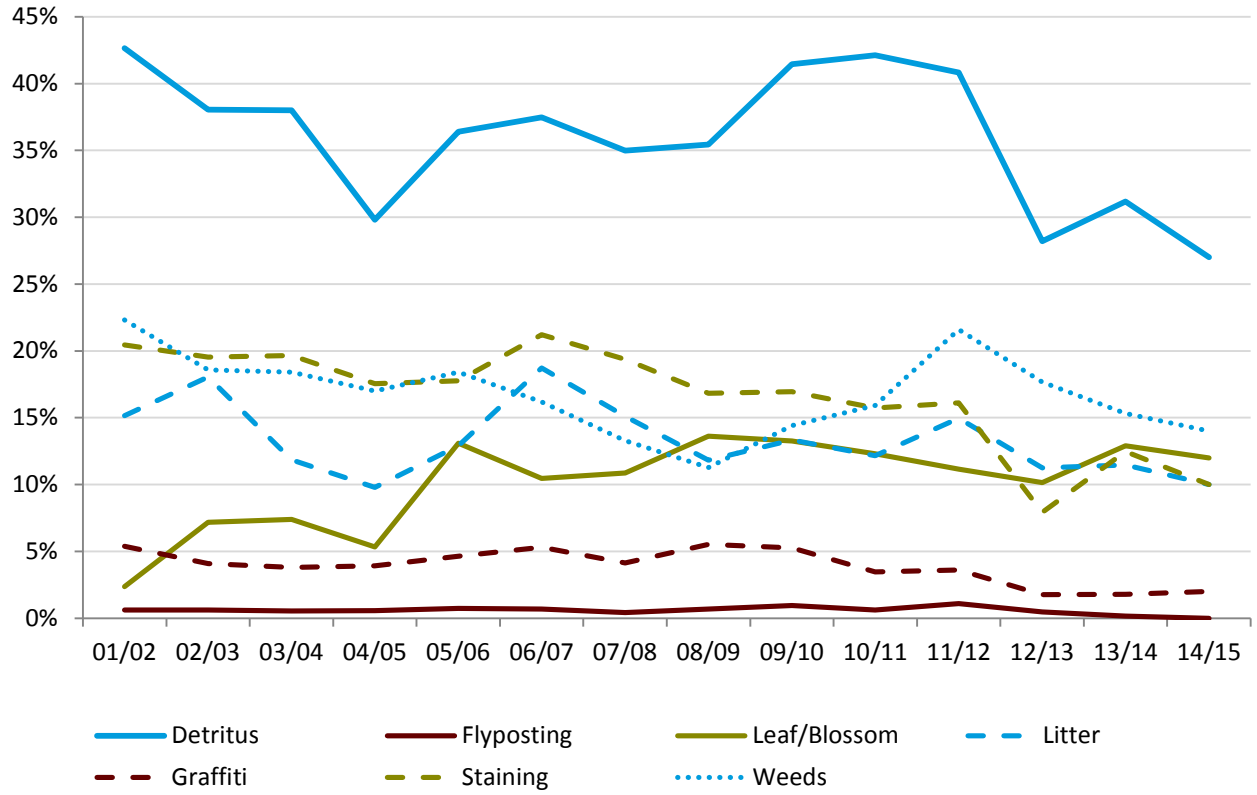
Notes: [1] Sites can hold more than one permit
Treatment includes composting, incineration and recycling

Source: Environment Agency
www.gov.uk/government/uploads/system/uploads/attachment_data/file/463507/LIT_10126.pdf

Section 8: Environmental issues relating to waste

Local Environment Quality - percentage of survey sites below an acceptable standard

Figure 8.1: Percentage of survey sites below an acceptable standard[1], England, 2001/02 - 2014/15



[1]An acceptable standard is Grade B and above – Predominantly free with some minor instances of the issue to none of the issues present

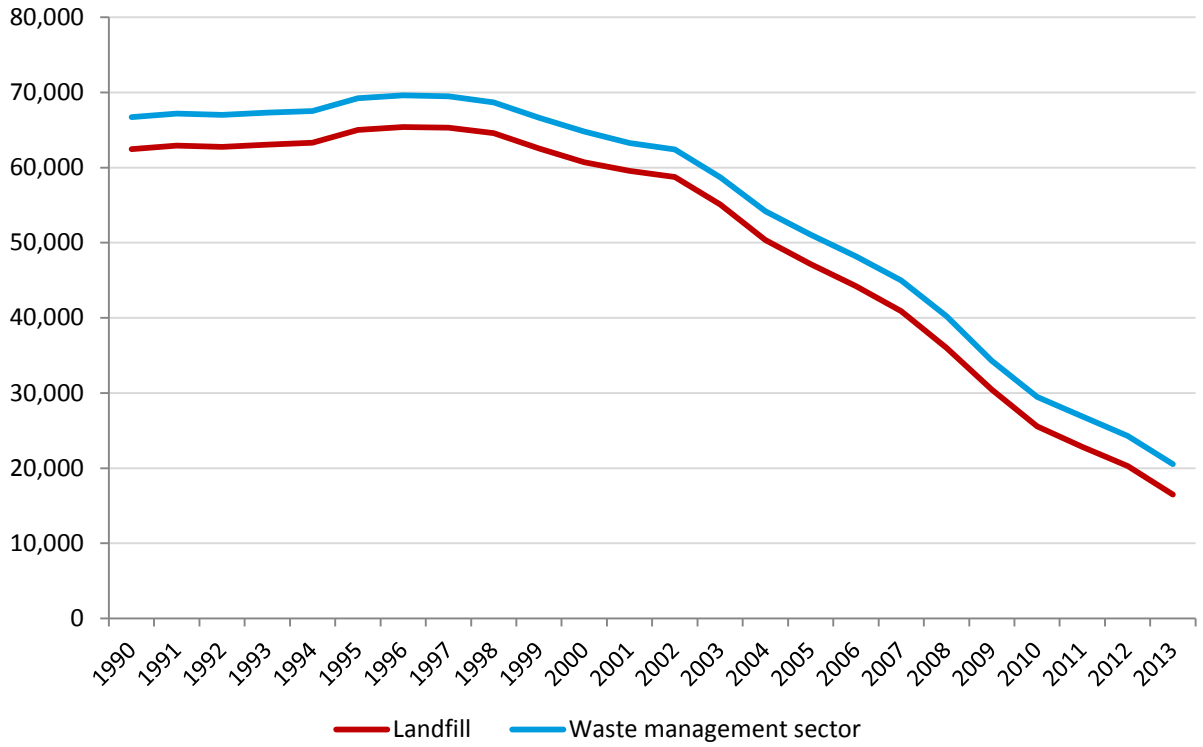
- Overall, litter and graffiti seem to have shown a long-term improvement in standards.
- Flyposting seems to have scored consistently well.

Notes: Due to a change in site selection methodology between 2012/13 and 2013/14 onwards, it is not possible to make any comparisons between these years.

Source: KBT, The Local Environmental Quality Survey of England 2014/15 (LEQSE) www.keepbritaintidy.org/Documents/Files/LEQSE%202014/KBT_LEQSE%202014_Online%20Final.pdf – Figure 4

Emissions from landfill

Figure 8.2: Historical trend of methane (CH_4) emissions from landfill and waste management sector, UK, 1990 – 2013 *(Waste Prevention Metric)*



- The above chart shows CH_4 emissions measured as 'carbon dioxide equivalents'.
- The amount of CH_4 emitted from landfills depends on the difference between methane generation and methane capture at landfill.
- Emissions have decreased since 1995 due to reductions in waste sent to landfill due to the introduction of landfill tax and an increase in recycling, the waste PFI programme, as well as improvements in landfill management and the introduction of CH_4 capture technology.

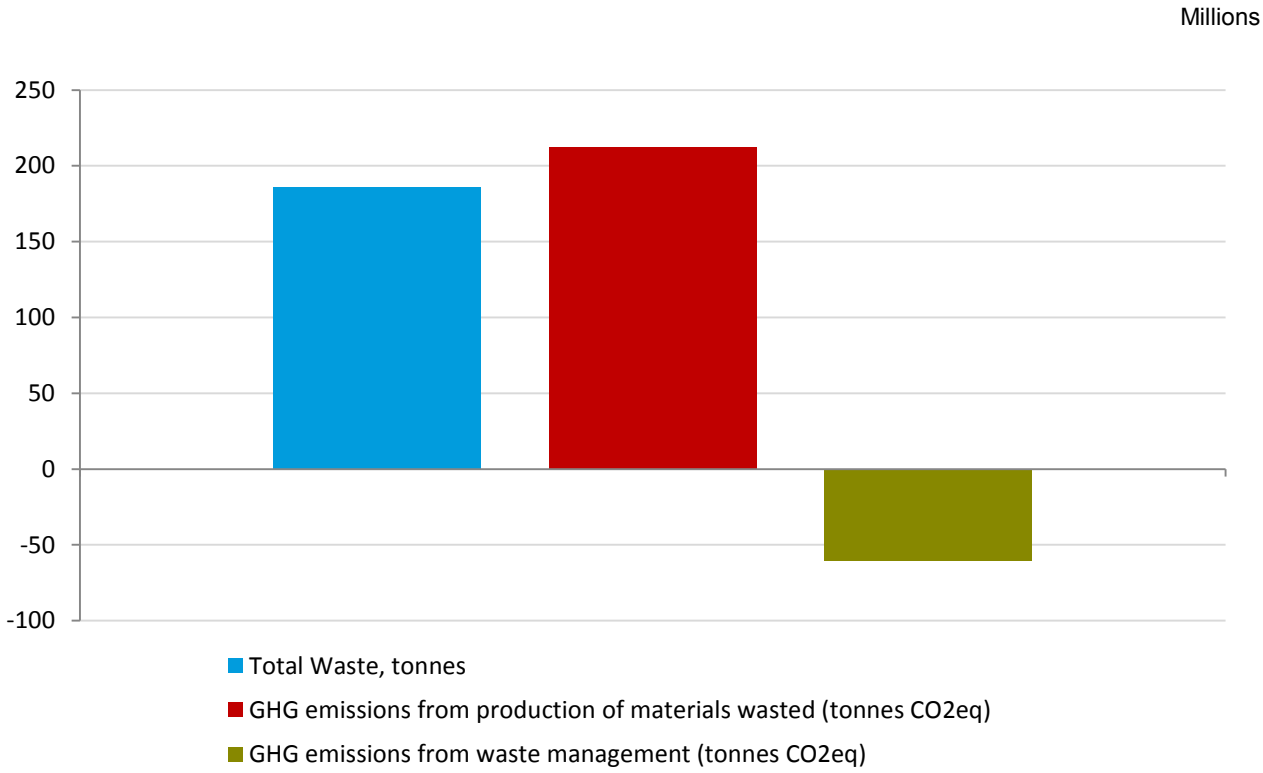
Notes: DECC have updated the global warming potential (GWP) of the non-CO2 GHGs (the GWP is the number used to multiply emissions of non-CO2 GHGs to convert them into CO2 equivalent). The GWP of methane increased (meaning that methane emissions expressed in terms of CO2 equivalent are higher than they previously were)

Source: DECC
www.gov.uk/government/statistical-data-sets/non-co2-greenhouse-gas-emissions-projections-report-summer-2015

Carbon Metric Factors

This section of the Digest presents data on carbon emissions from waste management.

Figure 8.3 Waste weight and GHG emissions 2012

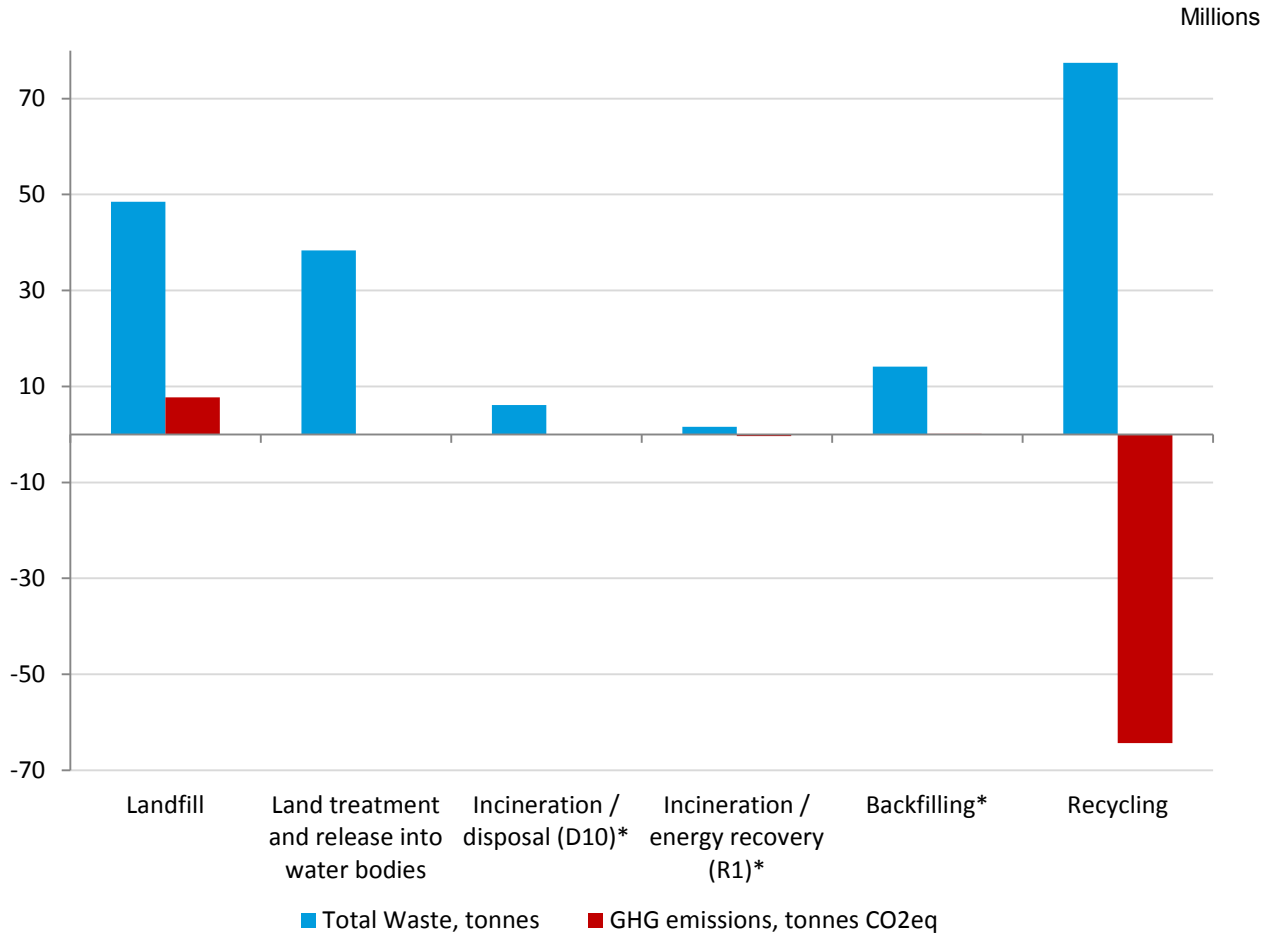


- Figure 8.3 shows total waste arisings, in million tonnes and total greenhouse gas emissions resulting from the production of materials which become waste and from waste treatment activities, measured in million tonnes of carbon dioxide equivalent (CO_2 eq).
- Emissions associated with materials discarded in 2012 were approximately 213 million tonnes of CO_2 eq, and the eventual treatment all of this waste avoids emissions of around 57 million tonnes of CO_2 eq. The majority of this benefit is from avoiding raw materials through recycling.

Notes: These are estimates based on a life cycle perspective and cover global emissions associated with materials discarded in the UK – they are not confined to emissions from the UK alone. For example, the emissions associated with imported products include embedded emissions.

Source: WRAP
Factors: www.ukconversionfactorscarbonsmart.co.uk/ as factors per tonne
Waste arisings:

Figure 8.4 Waste weight and GHG emissions 2012



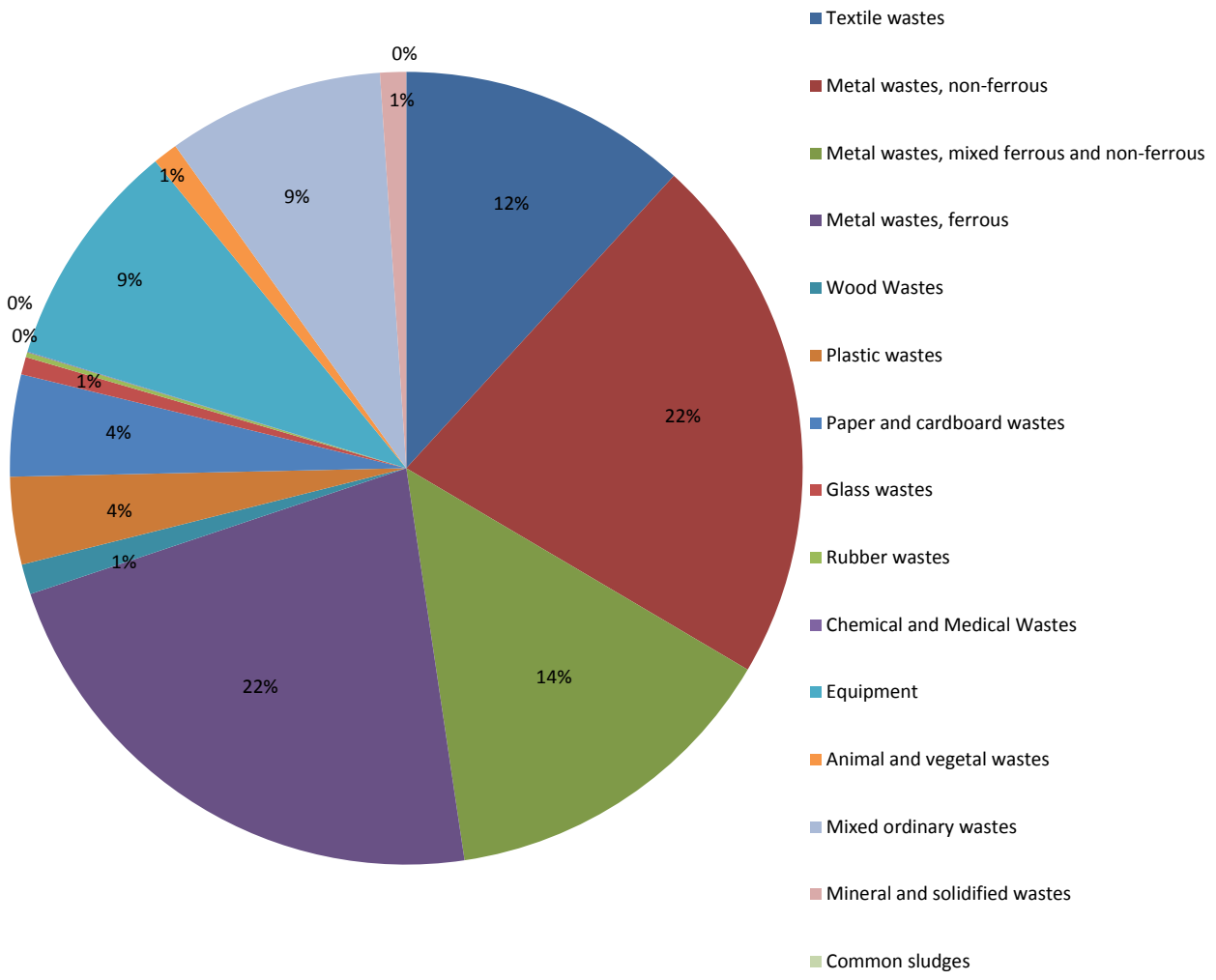
- Figure 8.4 shows total waste going into each waste management activity and the emissions from each of the activities.
- Depositing waste onto or into land results in emissions of around 7 million tonnes of CO_2 eq over and above those resulting from production.
- Land treatment and release into water bodies is largely dredging spoils and mineral wastes, the treatment of which results in negligible emissions.
- Recycling avoids emissions of around 64 million tonnes of CO_2 eq compared to providing an equivalent amount of materials from primary sources (e.g. mining).

Notes: * Incineration/disposal means thermal treatment of waste in an incineration plant or a co-incineration plant, incineration/energy recovery is incineration that fulfils the energy efficiency criteria laid down in the WFD, backfilling is a recovery operation where waste is used in excavated areas as a substitute for other non-waste materials

These are estimates based on a life cycle perspective and cover global emissions associated with materials discarded in the UK – they are not confined to emissions from the UK alone. For example, the emissions associated with imported products include embedded emissions.

Source: As for Figure 8.3

Figure 8.5: Contribution of Recycling GHG Benefits, 2012



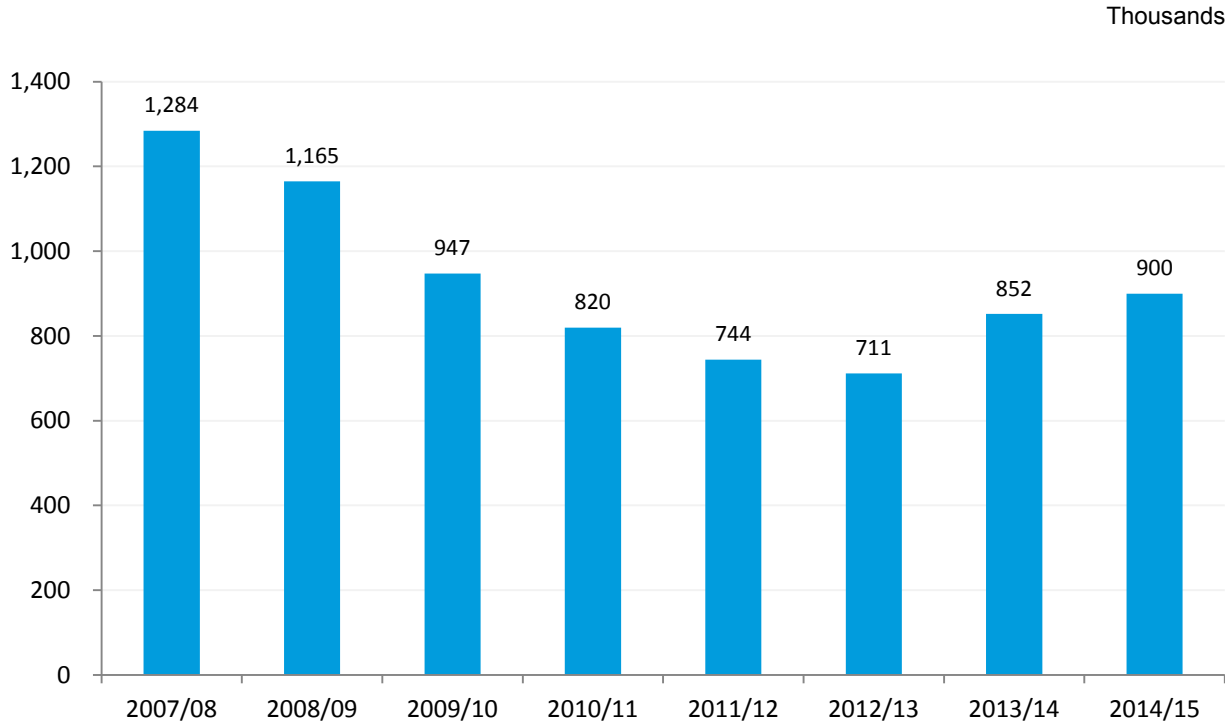
- The above chart shows that in 2012, over half of the emissions avoided by recycling come from animal and vegetal waste, metals and textiles. As some of these materials and wastes are traded internationally, the savings from recycling also extend beyond UK territorial emissions.

Source: WRAP

Section 9: Fly tipping, Waste Crime and Pollution Incidents

Fly tipping

Figure 9.1: Trends in number of fly tipping incidents, England, 2007/08 – 2014/15

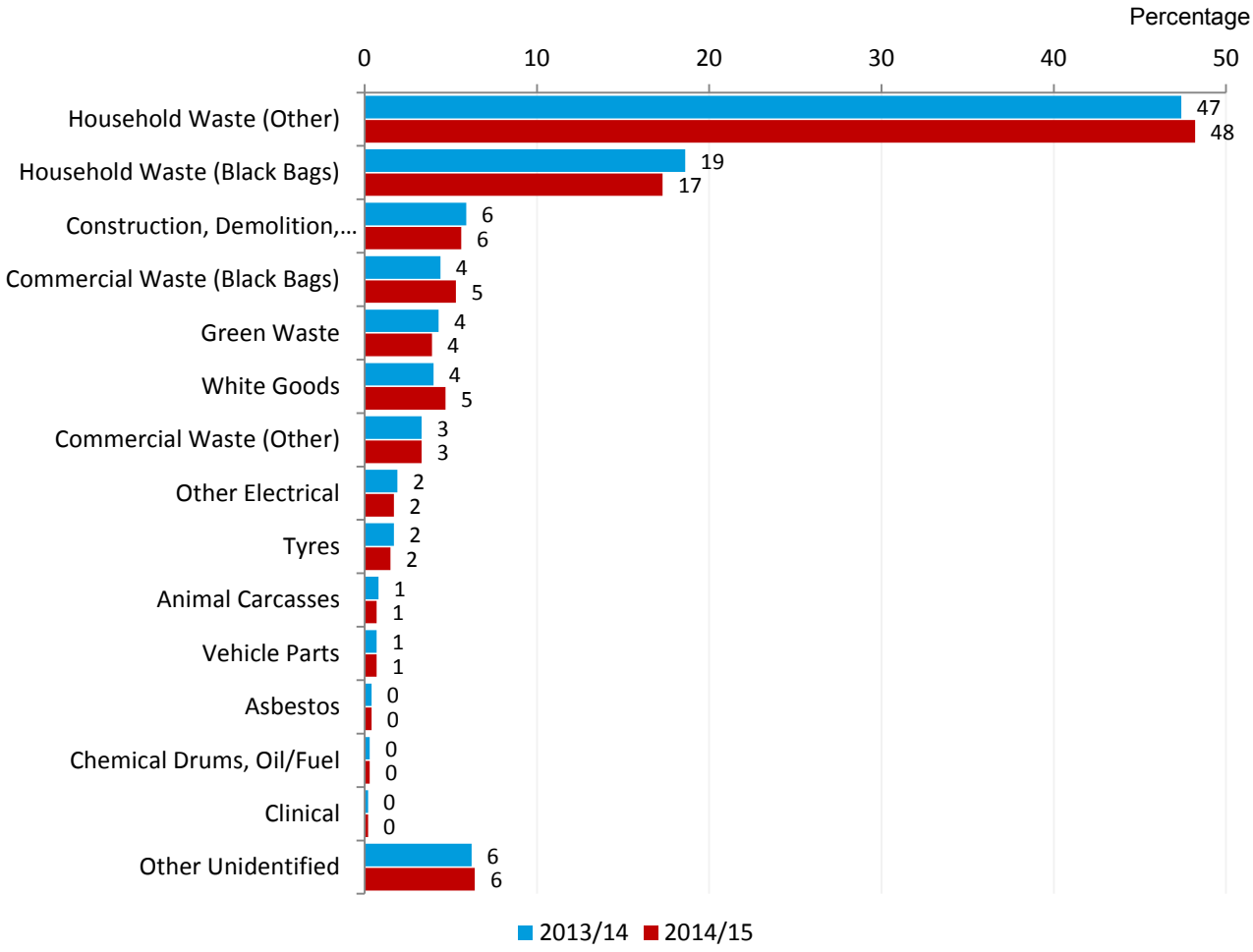


- Local Authorities dealt with 900 thousand incidents of fly-tipping in 2014/15 in England, ranging in size from single black bag to tipper lorry load.
- There was a 5.6 per cent increase in fly-tipping incidents in England in 2014/15 compared to 2013/14 with upward trends in most incident size categories.
- Single bag incidents and small black bag incidents were the size categories that saw a decrease.

Notes: Some local authorities have introduced new technologies such as on-line reporting and electronic applications, along with increased training for staff – this may have accounted for some of the increase in reported incidents.

Source: Flycapture
www.gov.uk/government/uploads/system/uploads/attachment_data/file/469566/Flycapture_201415_Statistical_release_FINAL.pdf- Figure 1

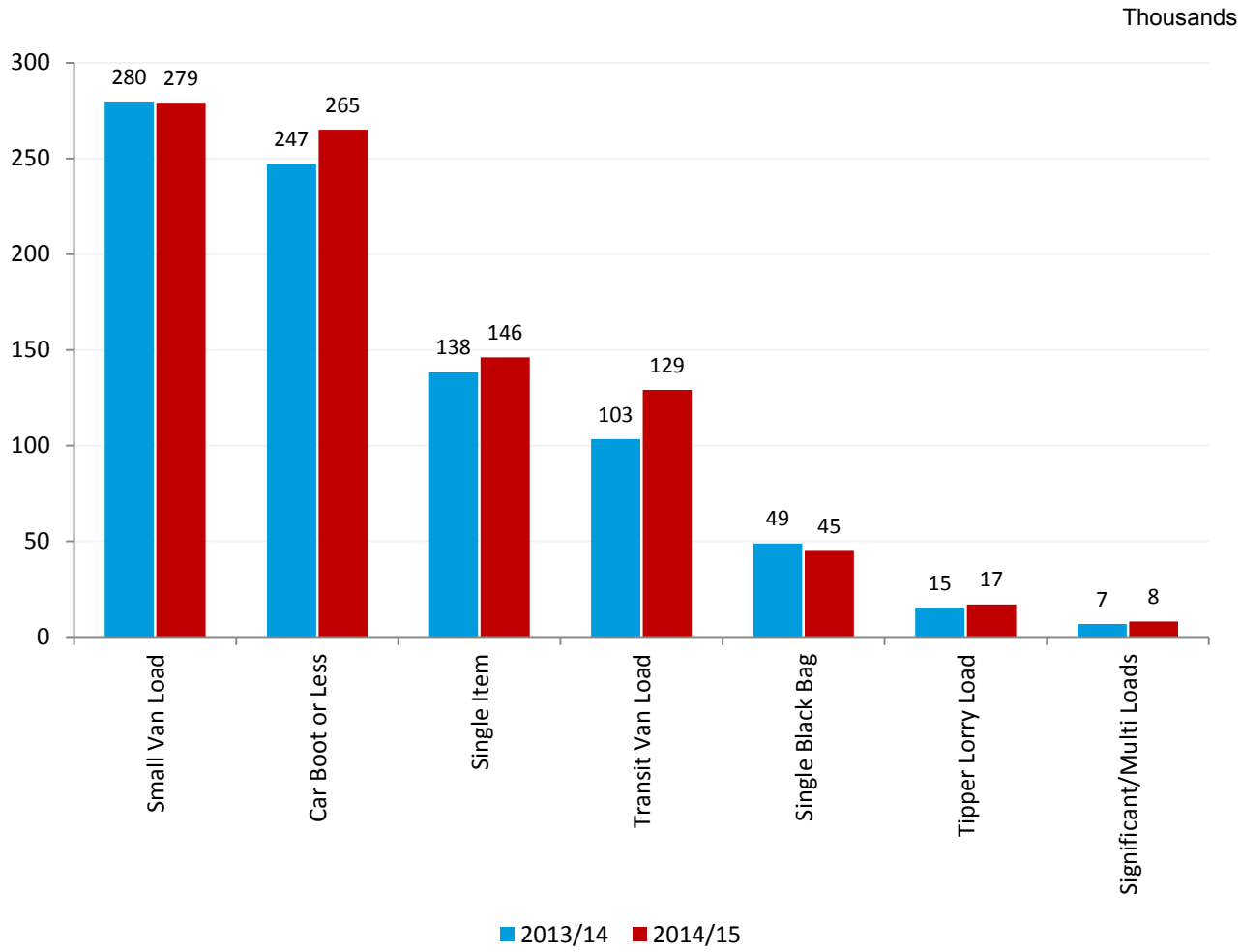
Figure 9.2: Fly-tipping incidents by type, as proportion of all incidents, England, 2013/14 and 2014/15



- 66 per cent of all fly-tips in England in 2014/15 were household waste. This was nearly 590 thousand incidents, one for every 40 households.
- Whilst the number of Household black bag incidents has decreased in 2014/15, the number of incidents of other Household waste has increased.
- Almost 9 per cent of incidents in England in 2014/15 were of commercial waste, an increase of 18 per cent since 2013/14.

Source: Flycapture
www.gov.uk/government/uploads/system/uploads/attachment_data/file/469566/Flycapture_201415_Statistical_release_FINAL.pdf - Figure 2

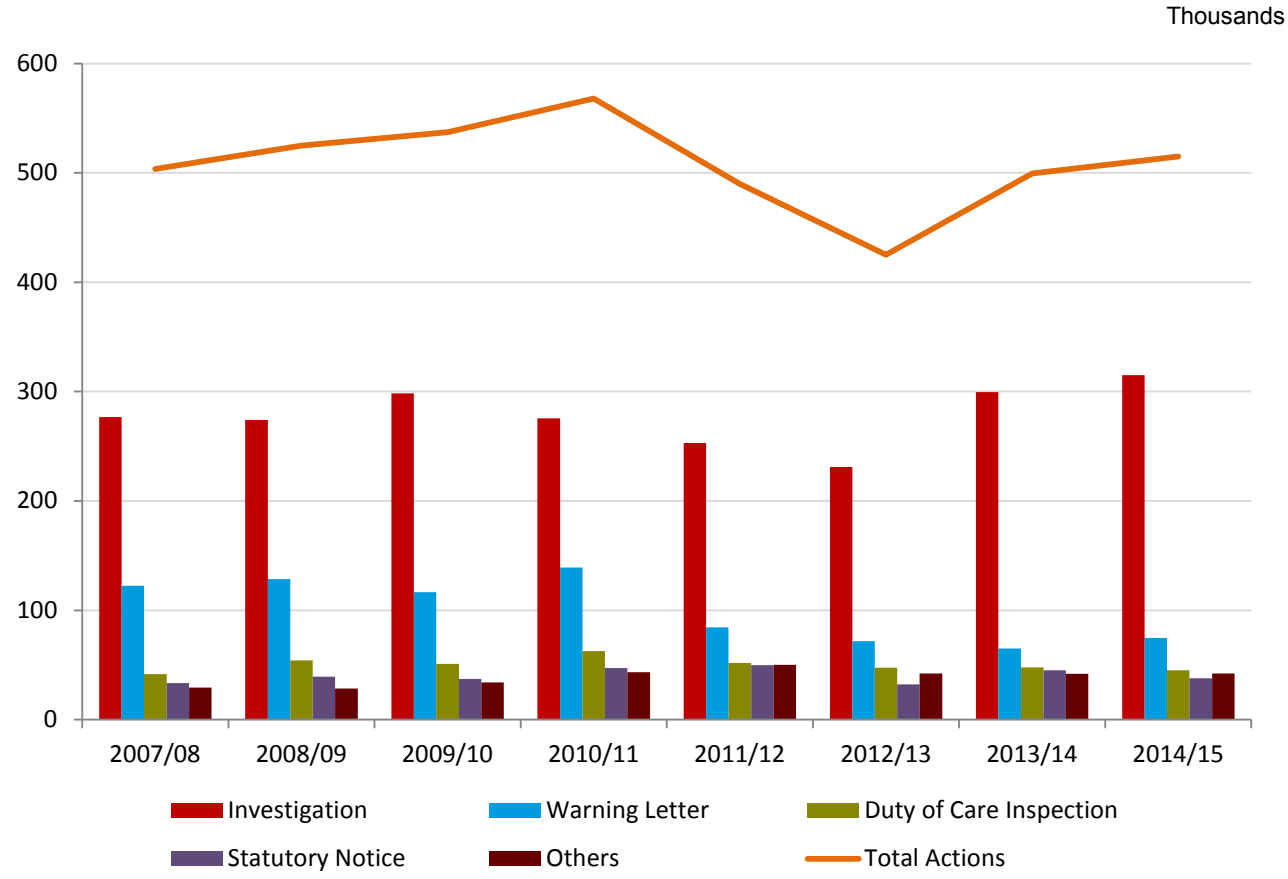
Figure 9.3: Fly-tipping incidents by size in England, 2013/14 and 2014/15



- 31 per cent of fly tipping incidents, 279 thousand, were small van load size.
- 16 per cent of incidents, 146 thousand, were recorded as single items, which would cover items such as furniture, mattresses etc.
- The estimated cost of clearance of fly-tipping to Local Authorities in England in 2014/15 was nearly £50 million, nearly 11 per cent higher than 2013/14.

Source: Flycapture
www.gov.uk/government/uploads/system/uploads/attachment_data/file/469566/Flycapture_201415_Statistical_release_FINAL.pdf - Fig 4

Figure 9.4: Fly-tipping enforcement actions in England, 2007/08 to 2014/15



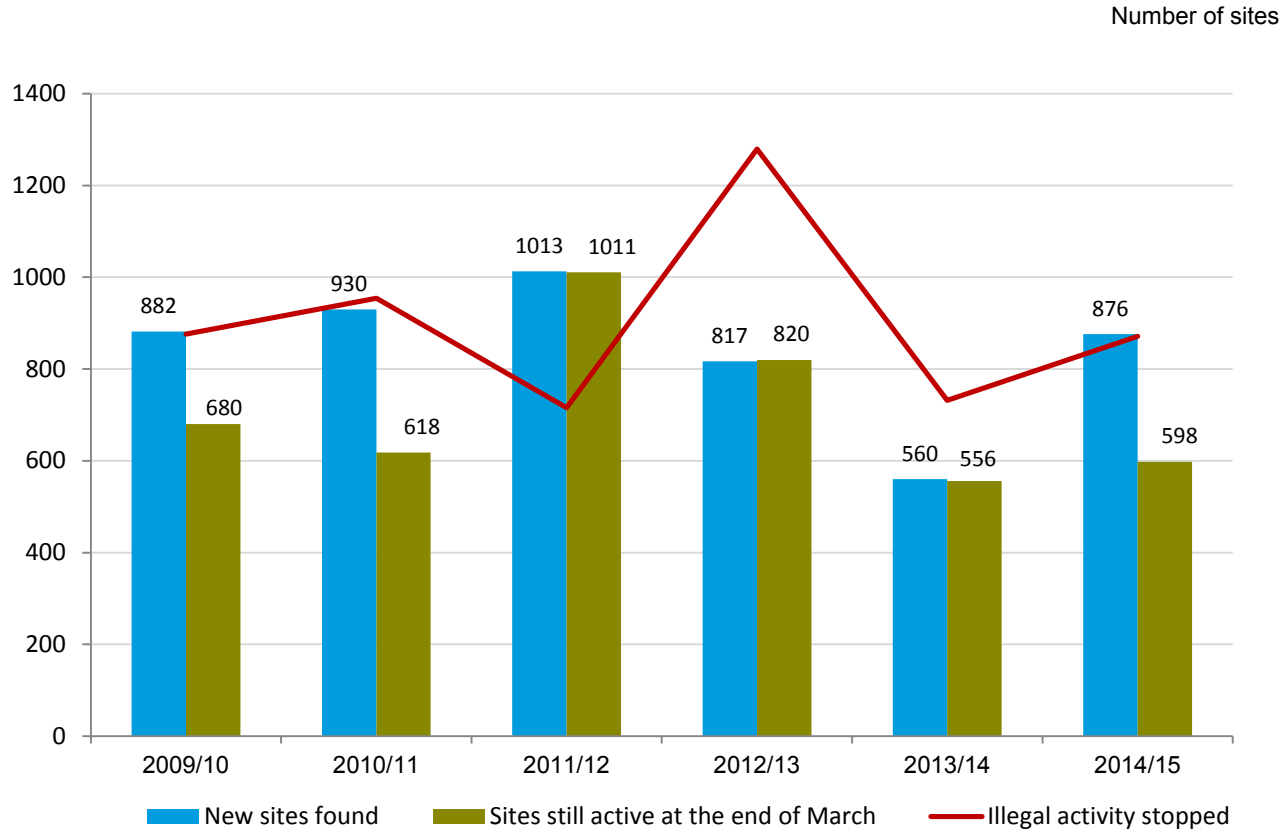
- Over 500 thousand enforcement actions were carried out in England in 2014/15, an increase of 3 per cent from 2013/14.
- Local authorities spent £17.6 million on enforcement actions in England in 2014/15, up from £17.3 million in 2013/14.
- Local authorities issued over 75 thousand warning letters, up from 65 thousand in 2013/14 and 38 thousand statutory notices, down from 45 thousand in 2013/14.
- Local authorities in England carried out 315 thousand investigations in 2014/15, up from 300 thousand in 2013/14, an increase of 5 per cent.

Source: Flycapture
www.gov.uk/government/uploads/system/uploads/attachment_data/file/469566/Flycapture_201415_Statistical_release_FINAL.pdf - Figure 5

Waste Crime

Illegal Waste Sites

Figure 9.5 Illegal Waste Sites, England, 2009/10 – 2014/15

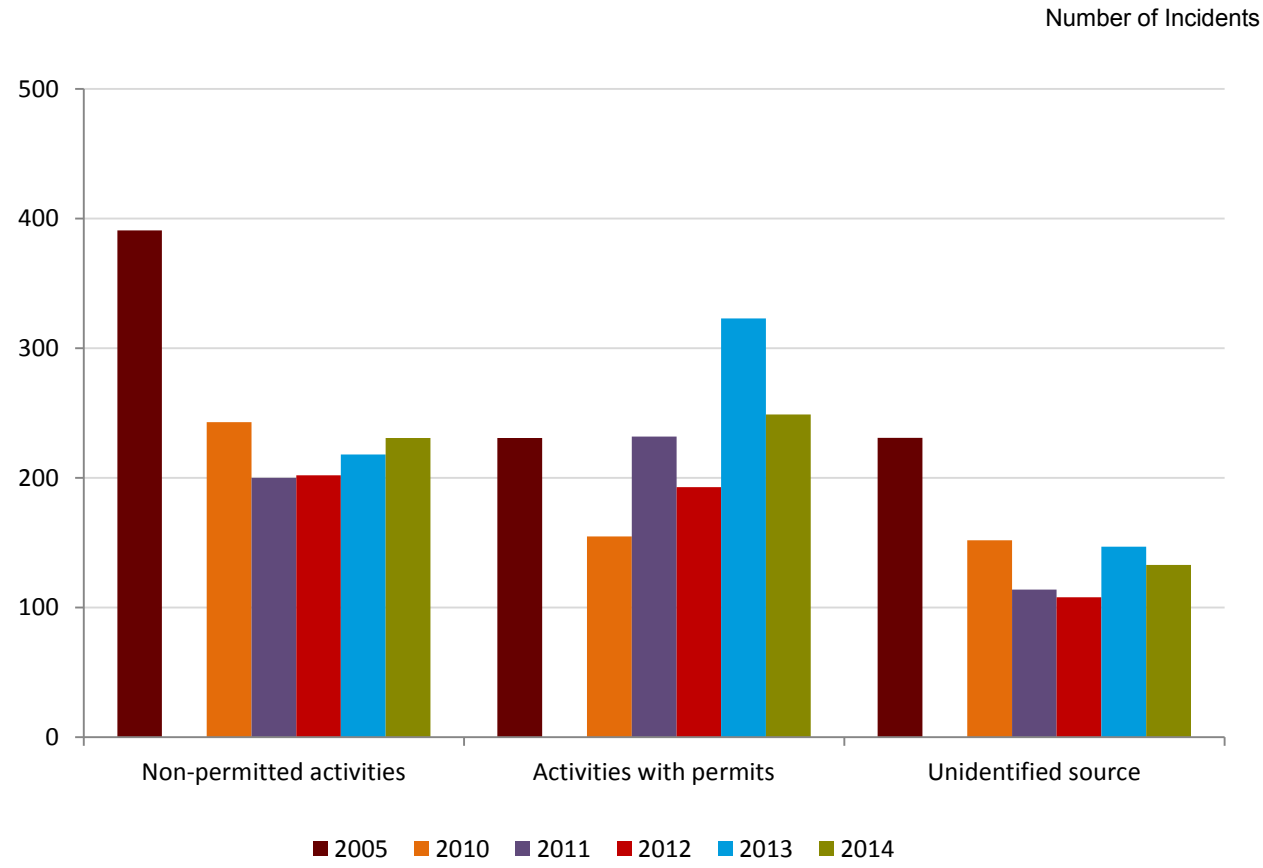


- Sites are illegal if they do not have a permit when they should, or do not meet all legal requirements.
- In 2014/15 illegal activity was stopped at 871 sites. The main activity being carried out was treating waste (such as composting or recycling activities). This was at 43 per cent of sites.
- The top 3 types of waste found at illegal sites were household and commercial waste, construction and demolition waste and end-of-life vehicles. These waste types made up two-thirds of the waste types found on sites where illegal activity was stopped.

Source: Environment Agency
www.gov.uk/government/uploads/system/uploads/attachment_data/file/463507/LIT_10126.pdf

Pollution Incidents

Figure 9.6: Serious Pollution Incidents (caused by activities with permits and those without permits), England, 2005, 2010 – 2014

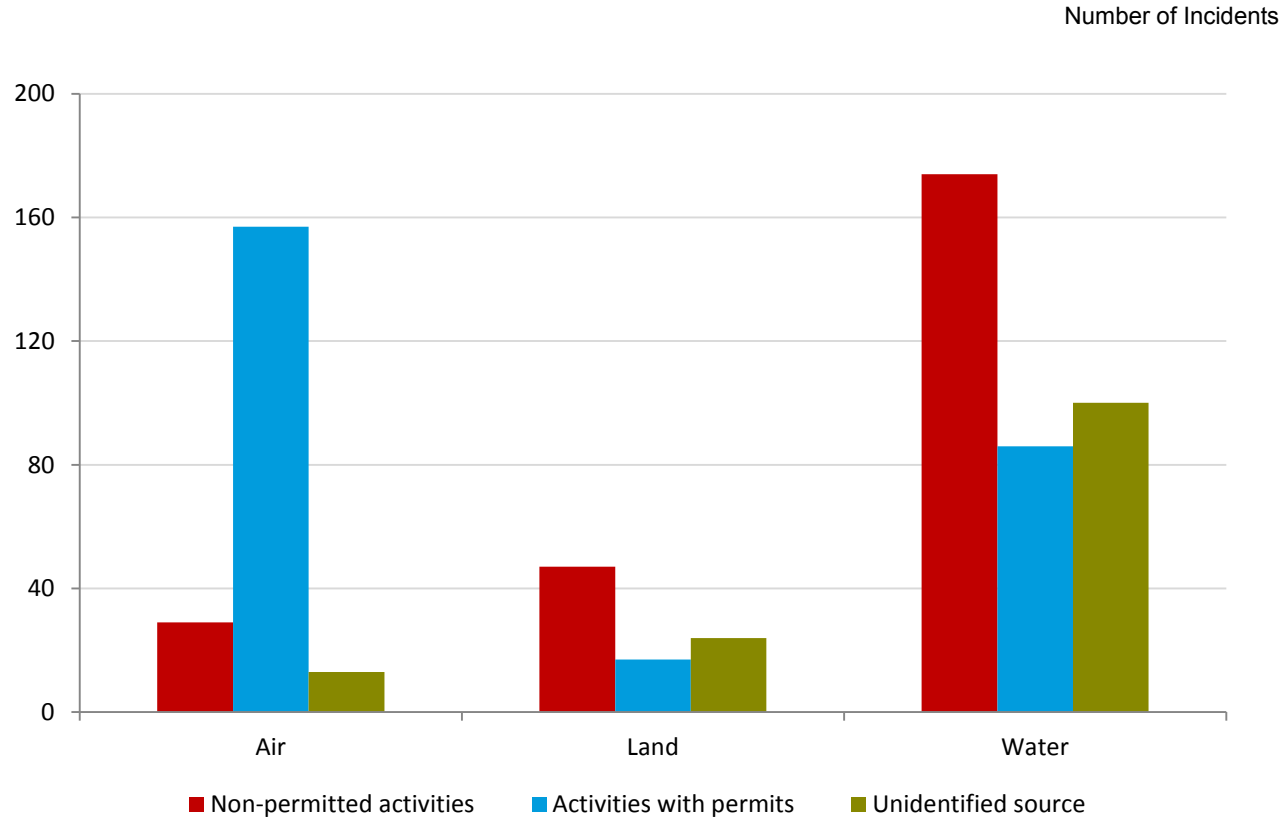


- The total number of serious pollution incidents decreased by 11 per cent in 2014 (688 incidents in 2013 and 614 incidents in 2014).
- However the total number is still higher than those recorded in 2012 (503 incidents).
- In 2014, there has been a 23 per cent decrease in incidents from sites with permits (from 323 incidents in 2013 to 249 incidents in 2014), but incidents from non-permitted[1] sites increased by 6 per cent (from 218 incidents in 2013 to 232 incidents in 2014), continuing a rising trend in incidents from these sites.

Notes: [1] Non-permitted sites or activities are sites that do not require a permit under EPR – they may not require a permit, may be regulated by other legislation, or may be sites that are operating illegally

Pollution incidents are classified according to their impact on the environment and people, from category 1 (the most serious) to category 4 (little or no impact). Categories 1 and 2 are included here.
Source: Environment Agency
www.gov.uk/government/uploads/system/uploads/attachment_data/file/448728/LIT_10127.pdf

Figure 9.7: Serious Pollution incidents to land, air and water, England, 2014



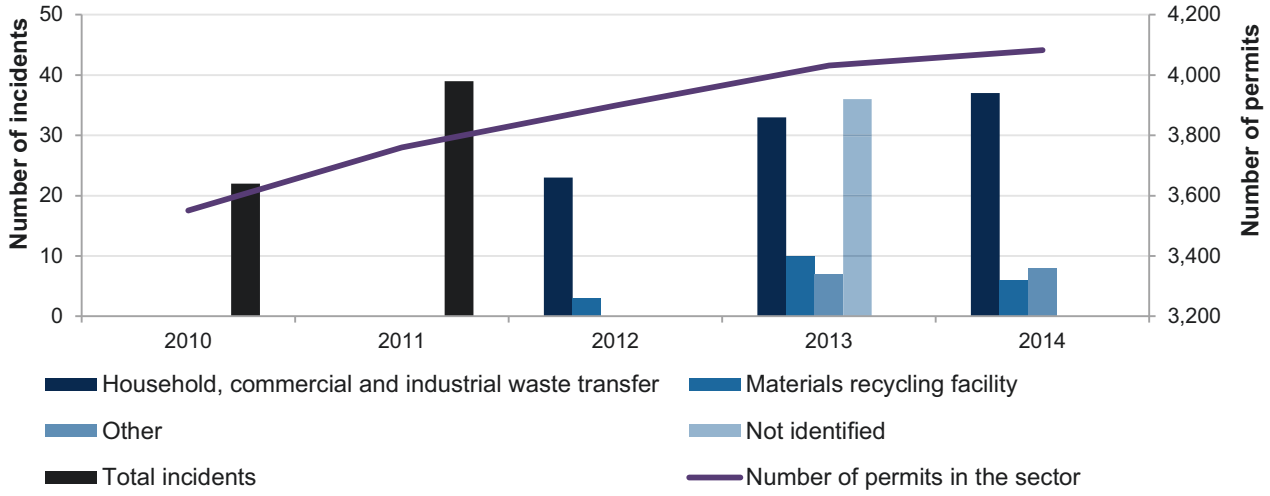
- Of all the serious pollution incidents in 2014, 59 per cent had an impact on water and 32 per cent had an impact on air[1].
- Serious pollution incidents caused by sites with permits mainly affected air.
- Serious pollution incidents caused by non-permitted sites and unidentified sources mainly affected water.

Notes: [1] A single incident may affect multiple environmental media (i.e. air, land, water).

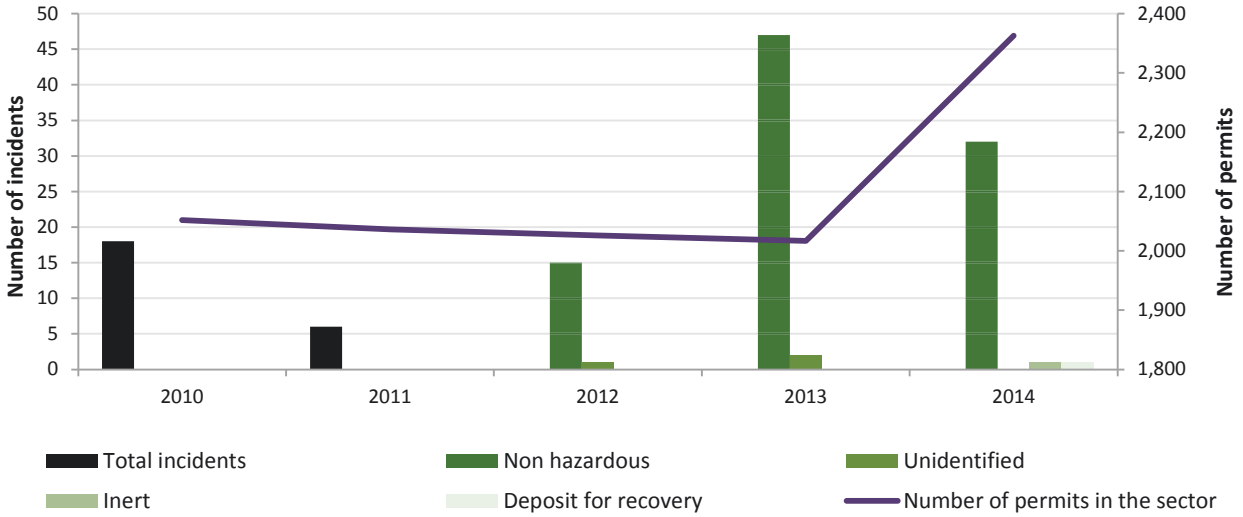
Source: Environment Agency
www.gov.uk/government/uploads/system/uploads/attachment_data/file/448728/LIT_10127.pdf

Figures 9.8- 9.10: Serious pollution incidents to all media in England

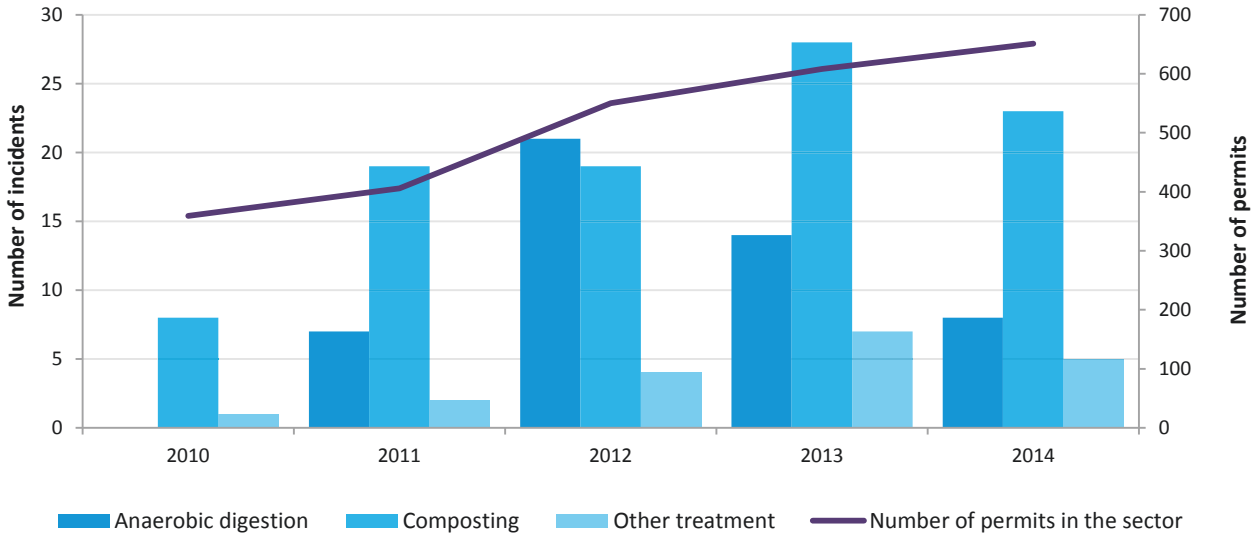
Waste treatment (non-hazardous)



Landfill



Biowaste sector



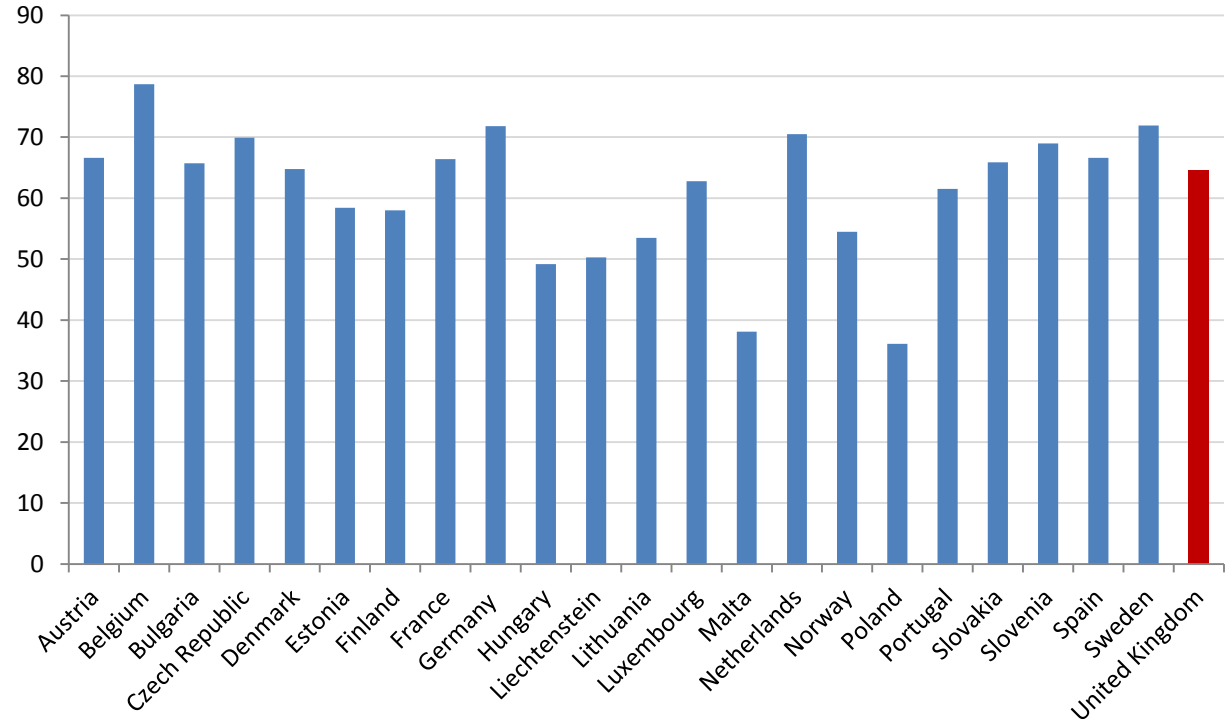
- The number of serious pollution incidents from each of these 3 waste sectors was lower in 2014 than in 2013.
- Serious pollution incidents caused by biowaste treatment sites are the lowest recorded since 2011, but incidents caused by non-hazardous waste treatment and landfill sites are still higher than in 2012.

Source: Environment Agency
www.gov.uk/government/uploads/system/uploads/attachment_data/file/448728/LIT_10127.pdf

Section 10: EU and UK comparisons

Recycling rate for packaging waste

Figure 10.1: Recycling rate for packaging waste, 2013

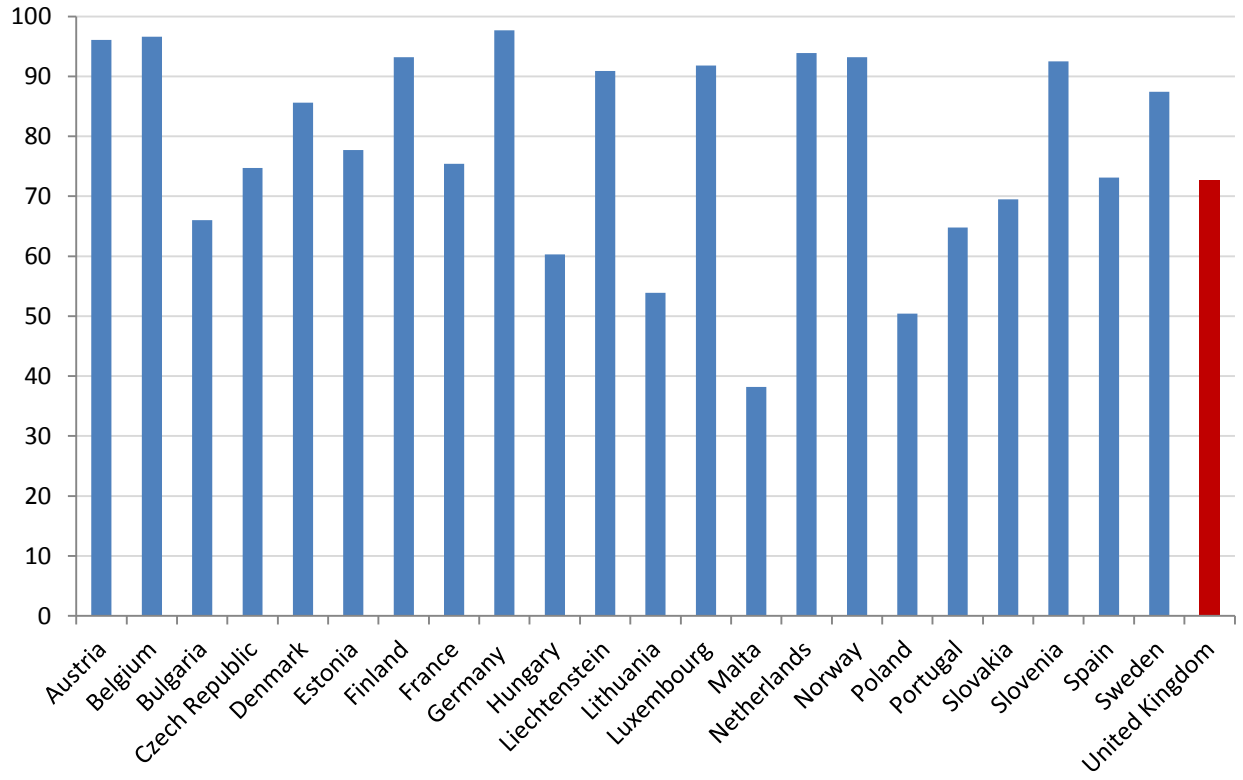


- The UK recycling rate for packaging waste in 2013 was 64.6 per cent, slightly higher than the rate in 2012 (61.4 per cent).
- Belgium had the highest rate for recycling packaging waste at 78.8 per cent; with Poland have the lowest rate at 36.1 per cent.
- Figures should be treated with some caution, particularly when making comparisons across Member States, as we have not robustly verified the quality of the data from other Member States.

Source: Eurostat

Recovery rates for packaging waste

Figure 10.2: Recovery rates for packaging waste, 2013

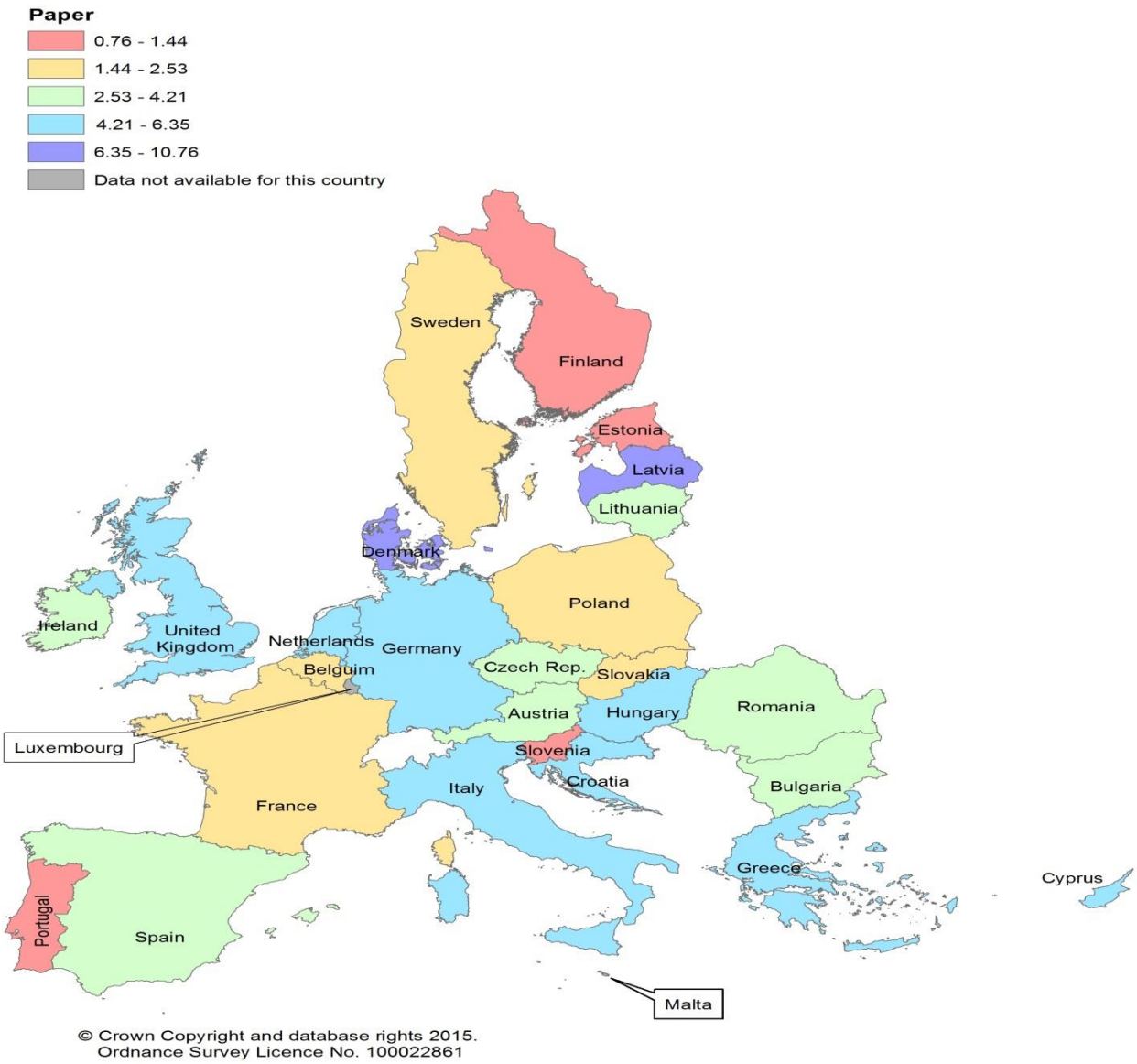


- The UK recovery rate for packaging waste in 2013 was 72.7 per cent, which was slightly higher than 69.1 per cent in 2012.
- Germany had the highest rate for recovery of packaging waste at 97.7 per cent, with Malta having the lowest rate at 38.2 per cent.
- Almost all countries saw an increase in their packaging recovery rates between 2002 and 2012, except for Denmark and Liechtenstein which both have seen a slight decrease over that time period.
- Figures should be treated with some caution, particularly when making comparisons across Member States, as we have not robustly verified the quality of the data from other Member States.

Source: Eurostat

Material Productivity

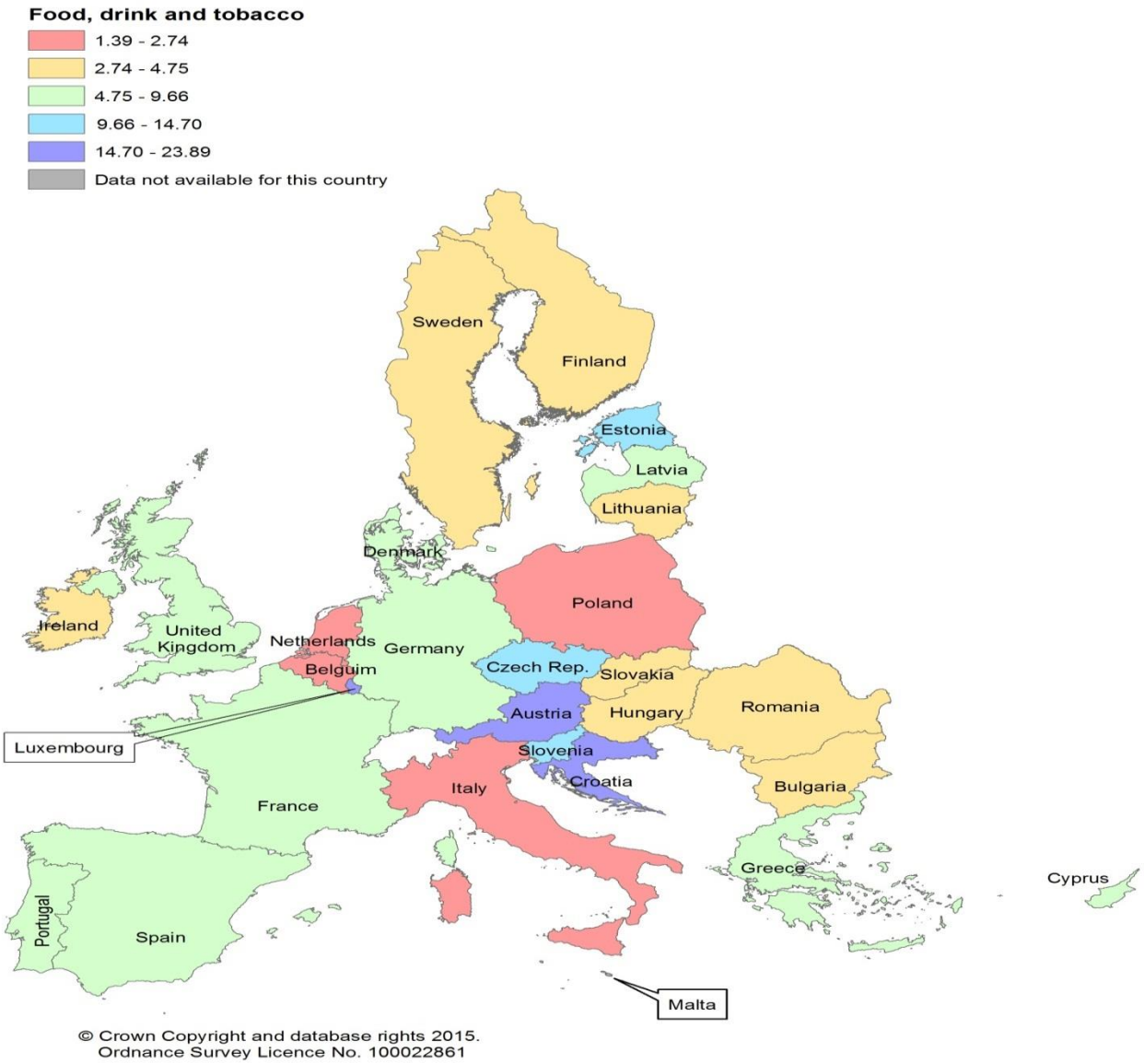
Figure 10.3: Gross value added by paper industry[1] per tonne of waste that paper industry produces, € per tonne, 2012



- The UK rate of €5.66 per tonne of paper waste, is above the EU_28 average of €3.04 per tonne.
- Latvia has the highest rate at €10.76 per tonne of paper waste, with Finland having the lowest rate at €0.76 per tonne.

Notes:[1] paper and paper products and printing and reproduction of recorded media
Source: Eurostat/WRAP

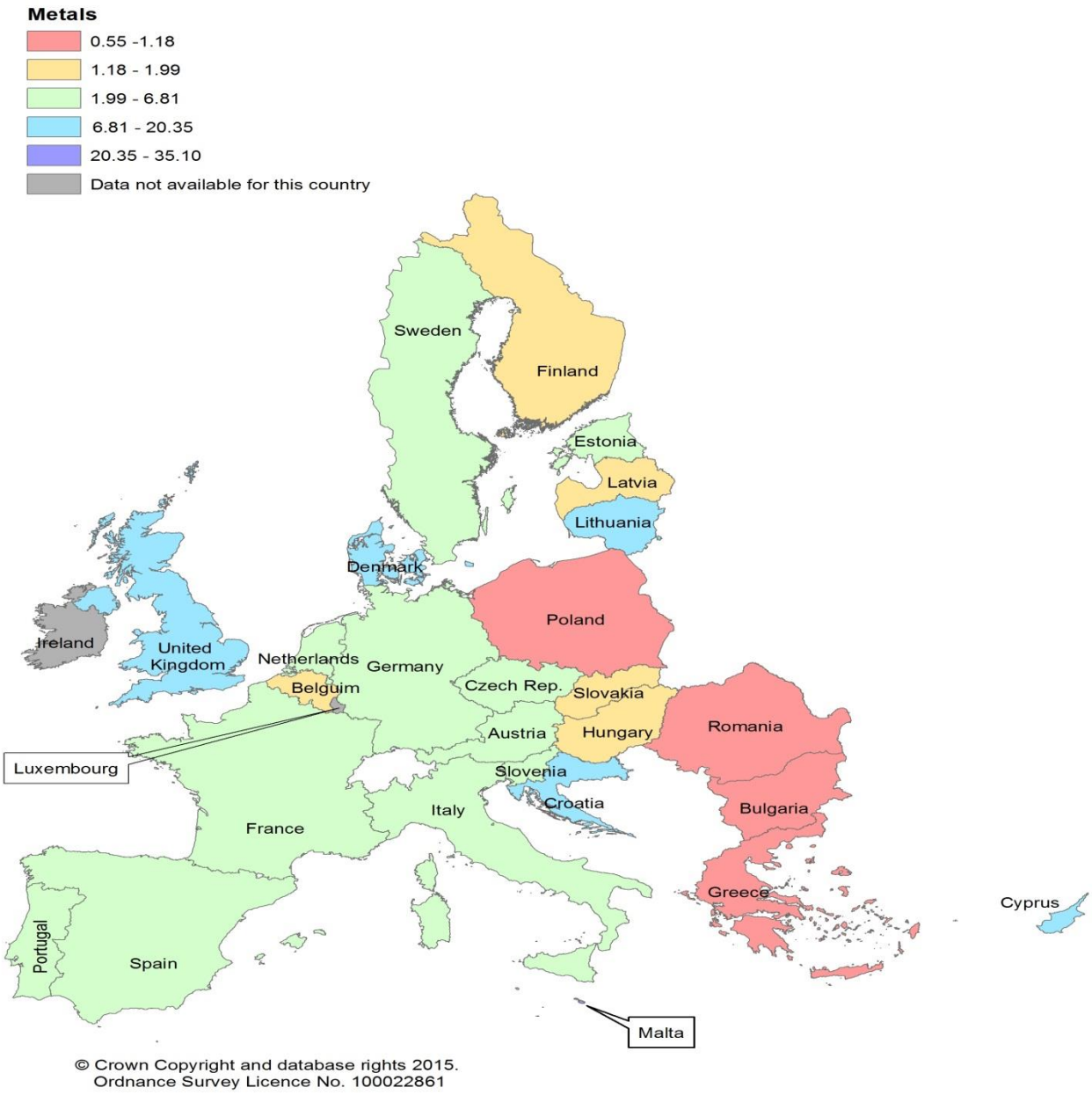
Figure 10.4: Value added by food, drink and tobacco industry per tonne of waste that food, drink and tobacco industry produces, € per tonne, 2012



- The UK rate of €9.66 per tonne of food, drink and tobacco waste is above the EU_28 average of €4.45 per tonne.
- Luxembourg has the highest rate at €23.89 per tonne of food, drink and tobacco waste, with Netherlands having the lowest rate at €1.39 per tonne.

Source: Eurostat/WRAP

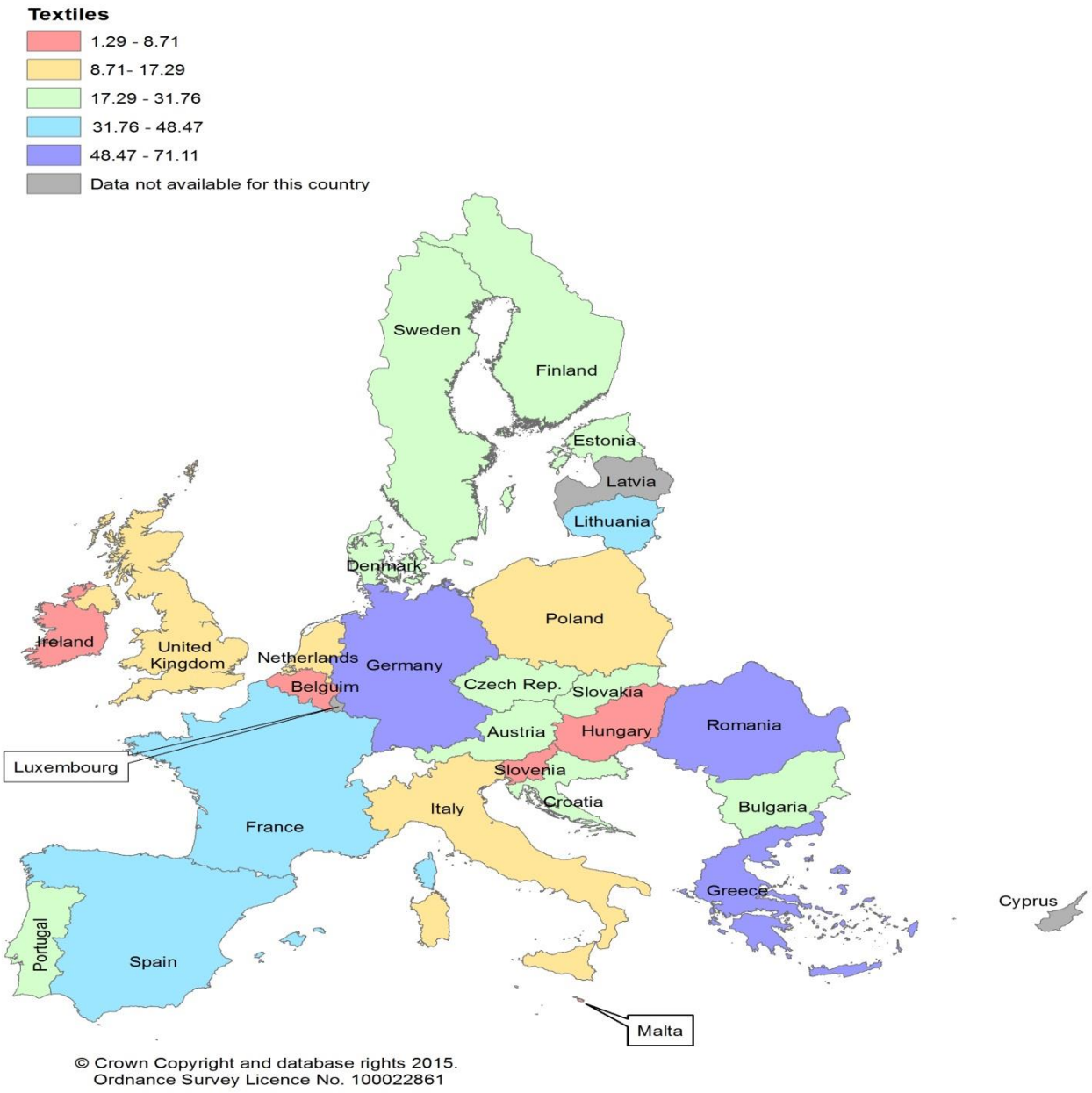
Figure 10.5: Value added by metal industry[1] per tonne of waste that metal industry produces, € per tonne, 2012



- The UK rate of €10.14 per tonne of metal waste, is above the EU_28 average of €3.23 per tonne.
- Malta has the highest rate at €35.10 per tonne of metal waste, with Greece having the lowest rate at €0.55 per tonne.

Notes: [1] Manufacture of basic metals and manufacture of fabricated metal products except machinery and equipment
Source: Eurostat/WRAP

Figure 10.6: Value added by textile[1] industry per tonne of waste that textile industry produces, € per tonne, 2012

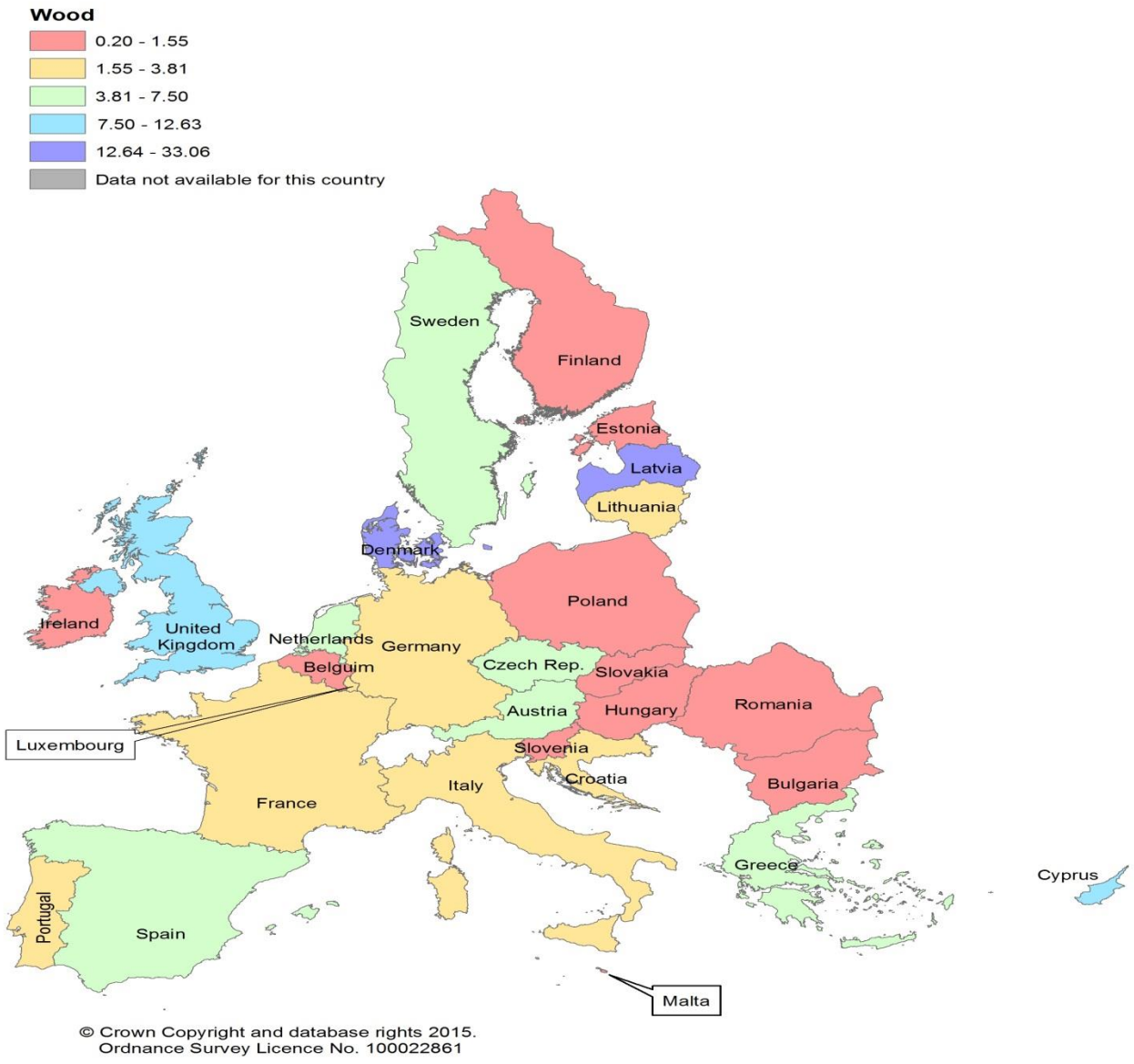


- The UK rate of €8.70 per tonne of textile waste, is below the EU_28 average of €15.10 per tonne.
- Greece has the highest rate at €71.11 per tonne of textile waste, with Belgium having the lowest rate at €1.29 per tonne.

Notes: [1] Manufacture of textiles, wearing apparel, leather and related products

Source: Eurostat/WRAP

Figure 10.7: Value added by wood[1] industry per tonne of waste that wood industry produces, € per tonne, 2012

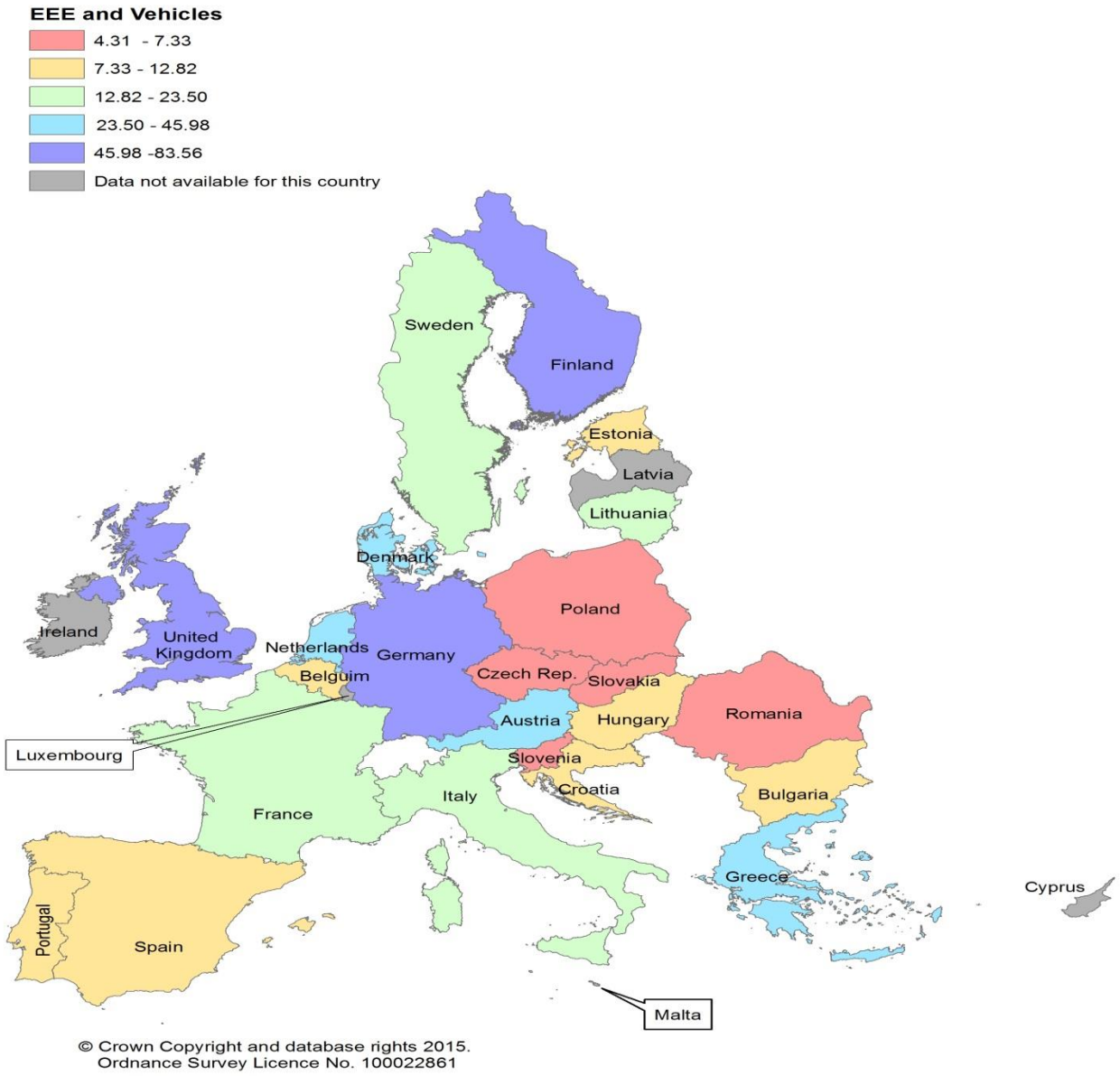


- The UK rate of €11.20 per tonne of wood waste, is above the EU_28 average of €1.50 per tonne.
- Denmark has the highest rate at €33.06 per tonne of wood waste, with Finland having the lowest rate at €0.20 per tonne.

Notes: [1] Manufacture of wood and of products of wood and cork, except furniture, manufacture of articles of straw and plaiting materials

Source: Eurostat/WRAP

Figure 10.8: Value added by EEE industry[1] per tonne of waste that EEE industry produces, € per tonne, 2012



- The UK rate of €59.54 per tonne of EEE and vehicle waste, is above the EU_28 average of €23.52 per tonne.
- Finland has the highest rate at €83.56 per tonne of EEE and vehicle waste, with Slovakia having the lowest rate at €4.31 per tonne.
- Finland adds most value to machinery and equipment.

Notes: [1] Manufacture of computer, electronic and optical products, electrical equipment, motor vehicles and other transport equipment

Source: Eurostat/WRAP

Glossary

Resource terms:

DMC: **Domestic Material Consumption** is (Domestic extraction + Imports – Exports) and measures the amount of materials used in the economy, and is calculated by subtracting exports from DMI.

DMI: **Direct Material Input** is (Domestic extraction + Imports) and measures the total amount of materials that are available for use in the economy.

GDP: **Gross Domestic Product** is an integral part of the United Kingdom's (UK) National Accounts and provides a measure of the total economic activity in the country.

GVA: **Gross Value Added** is a key component of GDP. It measures the contribution to the economy of each individual producer, industry or sector.-

CVM - **chained volume measures** is updated every year, meaning that, in practice, every series to be presented in real terms is estimated both in current prices and prices of the previous year (PYPs). The growth rates of the series in successive years on the same prices (for example 2006 estimated in current prices and 2007 in PYPs) are linked together in a chain of short series (known as chain-linking) to give a full real terms time series. CVMs are more responsive to major structural changes in the economy and, given the fact that the industry and product mixes of the economy are changing more rapidly now than in the past, they provide a more accurate picture of change in the economy than constant price series rebased every five years.

RMC: **Raw Material Consumption** is Domestic extraction and includes imports expressed or converted into their Raw Material Equivalents

RME: **Raw Material Equivalents** are the equivalents of domestic extraction from the rest of the world to produce the respective goods

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Waste terms:

AD: **Anaerobic digestion**. This process works by bacteria, which thrive in the absence of oxygen, breaking down the bio-degradable fraction of the waste to produce a stable residue.

BMW: **Biodegradable Municipal Waste.** It 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

CH_4:.**methane.** It is a colourless, odourless gas with a wide distribution in nature

C&I: **Commercial and Industrial waste.** This is waste from mainly manufacturing and service industries.

C&D: **Construction and Demolition** is a waste stream that is primarily received from construction sites. Some examples of C&D waste include, but are not limited to, concrete, rebar, wood, panelling, linoleum, and carpet

EfW: **Energy from Waste.** The process of creating energy in the form of electricity or heat from the incineration of waste materials

EU_28: Member States of the European Union as at July 2013

EWC: **European Waste Catalogue.** is a hierarchical list of waste descriptions established by the European Commission. These are used by industry to record their waste activities.

Fly-tipping: - refers to dumping waste illegally instead of using an authorised method

GWh – **Gigawatt-hours**. It is a Unit of electrical energy equal to one billion (10^9) watt hours, which is a unit of energy equivalent to one watt (1 W) of power expended for one hour (1 h) of time

Incineration: is a waste treatment technology that involves the combustion of organic materials and substances. Incineration and other high temperature waste systems are described as "thermal treatment". Incineration of waste materials converts the waste into incinerator bottom ash, flue gases, particulates, and heat, which can in turn be used to generate electric power.

IVC: **In Vessel Composting**. This can be used to treat food and garden waste mixtures. These systems ensure that composting takes place in an enclosed environment, with accurate temperature control and monitoring. There are many different systems, but they can be broadly categorised into six types: containers, silos, agitated bays, tunnels, rotating drums and enclosed halls.

KBT: **Keep Britain Tidy**. It is a British campaign run by the Keep Britain Tidy environmental charity.

LEQSE: **Local Environmental Quality Survey of England.** It is a report that tells just how clean our country is in a scientific, statistically robust way

MBT: **Mechanical Biological Treatment**. MBT describes a number of different processes dealing with the biological treatment of waste. It is the combination of both biological and physical processes, which can be arranged in a number of different ways

MRF: **Materials Recovery Facility**. Line of business where recyclable material is processed, separated, and sold. This is a facility where recyclable materials are sorted and processed for sale. This process includes separating recyclable materials (manually or by machine) according to type, and baling or otherwise preparing the separated material for sale. Operating costs and revenues for MRF's are accounted for as a separate line of business.

MSW: **Municipal Solid Waste.** This is "Regular" waste from non-industrial sources, such as residential homes, restaurants, retail centres, and office buildings. Typical MSW includes

paper, discarded food items, and other general discards. Green waste is considered MSW and includes garden clippings, leaves, trees, etc.

OAW: **Open Air Windrow**. This is a composting method used for processing garden waste, such as grass cuttings, pruning and leaves in either an open air environment or within large covered areas where the material can break down in the presence of oxygen.

Waste from Households: includes waste from: Regular household collection, Civic amenity sites, 'Bulky waste' 'Other household waste'. It does not include street cleaning/sweeping, gully emptying, separately collected healthcare waste, or asbestos waste. It is a narrower measure than 'municipal waste' and 'council collected waste'. It was first published by Defra in May 2014. It was introduced for statistical purposes to provide a harmonised UK indicator with a comparable calculation in each of the four UK countries and to provide a consistent approach to report recycling rates at UK level on a calendar year basis under the Waste Framework Directive (2008/98/EC).

WEEE: **Waste Electrical and Electronic Equipment Regulations.** Recycling of WEEE is a specialist part of the waste and recycling industry. The Waste Electric and Electronic Equipment (WEEE) Regulations 2013 became law in the UK on the 1st of January 2014

WRAP: **Waste and Resources Action Programme**. This is a UK based non-profit recycling advocate

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Food Waste terms

Avoidable waste: Food and drink that is thrown away untouched or opened/started but not finished (e.g. whole apples, yoghurts, half loaves of bread, unused slices of bacon etc.) or food and drink we cook or serve too much of

Possibly Avoidable waste: Food that some but not all people would eat (e.g. bread crusts) or that can be eaten when a food is prepared in one way but not in another (e.g. potato skins).

Unavoidable waste: This is elements of food that has not been edible under normal circumstances, such as bones, cores, peelings egg shells, banana skins and tea-bags