HOUSEHOLD WASTE COLLECTION BENCHMARKING REPORT

Prepared for:

IRISH WASTE MANAGEMENT ASSOCIATION

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BASIS OF REPORT

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Executive Summary

The Irish Waste Management Association (IWMA) commissioned SLR Consulting to benchmark the cost of household waste collection services in the Republic of Ireland (Ireland) against services offered in countries across Europe. In addition, SLR was asked to examine historical household waste collection and treatment costs in Ireland, at a time when the local authorities were heavily involved in the market.

Benchmarking Against Other Countries

Municipal solid waste (MSW) management in Ireland is quite advanced in terms of environmental performance, but not quite as good as the best performing countries in Europe, that have no reliance on landfill and very high recycling rates. Using the latest Eurostat data,[1] Ireland's recycling rate is 42% and disposal of MSW to landfill is 22%.

Some European countries lag well behind Ireland in this regard and have a high reliance on landfill and low recycling rates. Comparing prices and costs in Ireland against countries with a heavy reliance on cheap landfill would be unfair, so in order to benchmark like with like, we removed countries that landfill more than 40% MSW and have an MSW recycling rate of less than 30%.

Labour costs are quite variable across Europe and we took the view that benchmarking Ireland against countries with very high labour costs or very low labour costs would be unfair. We therefore excluded countries that have average labour costs of greater than €46 per hour and also excluded countries that have average labour costs of less than €20 per hour[2]. Ireland has average labour costs of €31 per hour, according to 2017 Eurostat data.

We struggled to get data on Luxembourg, so that country was also excluded from the study at this point. The final shortlist of 14 countries considered in the study is as follows:

1. Austria	4. England	7. Germany	10. Northern Ireland	13. Sweden
2. Belgium	5. Finland	8. Italy	11. Rep. of Ireland	14. Wales
3. Denmark	6. France	9. Netherlands	12. Scotland	

SLR's research team sourced data from each of the benchmarked countries. We contacted many of the waste management associations in these countries and with their assistance, we sourced national data on the costs of household waste collection and treatment. For completeness, we also sent working drafts of our report to these associations for peer-review and received some useful feedback that influenced our final report.

In order to compare like with like, we removed VAT where it applied and we removed the costs associated with the operation of civic amenity sites, litter management and street cleaning. In some cases where we believed that administration costs were not included in the published data, we added 4% to the costs, based on the breakdown of detailed data that was sourced from the UK.

[1] Generally 2016 data, with some 2014 data applied where 2016 data is unavailable.

[2] based on Eurostat 2017 data for labour costs for enterprises of 10 or more employees. The quoted cut-off points are 50% higher than Ireland and 50% lower than Ireland.

The service offered for kerbside household waste collection across Europe is very variable and varies quite a lot internally in some countries. In our report, we provide details on the types and frequencies of collection for household wastes.

Taking the estimated costs of household waste collection and treatment in each of the benchmarked countries, the lowest to highest costs are listed in Table 1 below, with some relevant comments.

Table 1 Household Waste Collection Costs per Capita in Each Country

Rank	Country	Cost per capita	Comments
1	Finland	€ 59.54	No recyclables collected from single houses. Low rural population.
2	Belgium (Flanders)	€ 62.85	Flanders only. High population density & very low rural population.
3	France	€ 73.00	Biowaste not commonly collected at kerbside.
4	England	€ 73.75	Relatively low labour costs. High Population density. Low rural population.
5	Germany	€ 74.00	Costs are for 100 largest cities, so urban in nature.
6	Wales	€ 76.80	Relatively low labour costs.
7	Netherlands	€ 79.63	High Population density. Low rural population
8	Republic of Ireland	€ 81.50	Low population density. High rural population.
9	Scotland	€ 84.63	Low population density.
10	Northern Ireland	€ 101.84	Low population density. High rural population.
11	Italy	€ 106.00	High rural population.
12	Austria	€ 107.00	High rural population.
13	Sweden	€ 114.00	Low population density & relatively high labour costs
14	Denmark	€ 134.00	High labour costs. Relatively low population density
	Average	**€ 87.75**	

The data shows that Ireland is mid-table and the cost is below average for the benchmarked countries.

There is a large variation in the ratio of apartments to houses across Europe. In Ireland, only 7.3% of people live in flats/apartments, whereas the EU average is 41.8% according to Eurostat 2016 data. Collecting waste from apartments costs a lot less per person when compared with collecting waste from individual houses. In Ireland, our research has found that the cost of collection per person in individual houses is about 50% more expensive than the cost per person living in apartments.

In order to benchmark fairly, we normalised each country's costs by adjusting the cost per capita based on the percentage of people living in apartments and the percentage living in houses. The adjusted (normalised) case is based on the EU average of 41.8% of people living in apartments.

This adjustment increased the benchmarked cost per capita of countries such as Germany and Italy that have a high level of apartment dwellers and lowered the benchmarked cost per capita of countries such as Ireland, the UK, the Netherlands and Belgium that have lower levels of apartment dwellers.

The adjusted figures are presented in Table 2 below, which also provides more detail on some of the factors that influence the costs of household waste collection.

Table 2 Household Waste Collection Costs Per Capita Adjusted to Account for Apartments

Rank	Country	Adjusted cost per Capita	Average Labour Costs € per hour	Population Density (people per km2)	Rural Population	Recycling Rate	Landfill Reliance
1	Belgium (Flanders)	€ 58.35	€ 39.60	480	2%	54%	0.8%
2	Finland	€ 59.08	€ 32.70	18	16%	42%	3.3%
3	England	€ 66.65	€ 25.70	420	17%	45%	15.6%
4	Wales	€ 69.41	€ 25.70	149	20%	61%	9.6%
5	France	€ 70.20	€ 36.00	106	20%	42%	22.4%
6	Republic of Ireland	€ 72.00	€ 31.00	69	36%	42%	21.7%
7	Netherlands	€ 73.12	€ 34.80	498	9%	53%	1.4%
8	Scotland	€ 76.48	€ 25.70	67	18%	43%	45.3%
9	Germany	€ 78.66	€ 34.10	233	24%	66%	1.5%
10	Northern Ireland	€ 92.04	€ 25.70	136	37%	43%	37.0%
11	Austria	€ 108.34	€ 34.10	106	34%	59%	2.7%
12	Italy	€ 110.58	€ 28.20	204	31%	51%	27.6%
13	Sweden	€ 115.48	€ 38.30	24	14%	49%	0.6%
14	Denmark	€ 129.09	€ 42.50	136	12%	48%	1.0%

It can be seen from Table 2 that some of the more expensive countries such as Sweden, Denmark and Austria are achieving very low landfill levels and very high recycling rates. Austria, Italy and Northern Ireland have a relatively high proportion of their population living in rural areas and this clearly adds cost.

Belgium (Flanders) and England have very high population densities, which may explain the low costs in those countries. Finland is low cost for a country with a very low population density, but the demographics are helped by the fact that only 16% of the population live in rural areas. This is even more of an advantage in Belgium, where World Bank data reports that only 2% of people live in rural areas.

The Republic of Ireland is performing well on price, but lags behind many of the benchmarked countries in terms of recycling rates. We expect that the continued roll-out of brown (organic) bins will increase Ireland's recycling rate without having a significant impact on the prices charged to householders. We expect that the recycling rate can reach 50% through this ongoing programme, which is the average of the benchmarked countries.

The biggest factors for prices in Ireland are thought to be the high rural population and the low population density. The prices in Ireland are significantly lower than in other countries that have a high percentage of the population living in rural areas, such as Northern Ireland, Austria and Italy, so the price performance in Ireland is considered to be very good in light of the demographics.

Benchmarking Against Historical Costs

SLR used the following sources of data for benchmarking against historical costs of household waste collection and treatment:

- A Competition Authority (CA) Report[3] published in 2005 containing a survey of private sector charges in 2004.
- Local authority budgets from 2004/5, mostly accessed through Freedom of Information requests.
- Various Regional Waste Management Plans published in 2005.
- A 2005 report prepared by Trinity College Dublin for the EPA.[4]

SLR selected 2004 as the base year for benchmarking for two reasons. Firstly, it was prior to the mass withdrawal of local authorities from waste collection and secondly, there was good reliable available data on that year from the sources quoted above. Where 2004 data was unavailable or unreliable, we used 2005 data instead.

The results of our analysis are presented in the Tables 3 to 5 below.

Table 3 CA Survey of Private Operator Charges for Household Waste Collection Services in 2004

County	Annual Price (€) 240 l bins	County	Annual Price (€) 240 l bins
Carlow	420-444	Louth	270-372
Cavan	324	Mayo	300-360
Clare	330	Meath	270-372
Cork	360-370	Monaghan	324-372
Donegal	360	Offaly	312-324
Galway	350-375	Tipperary	380-384
Kildare	320-360	Roscommon	350
Kilkenny	456-480	Sligo	350
Laois	320-384	Waterford	480
Leitrim	380	Wexford	420-460
Limerick	344	Wicklow	372
Longford	324-380		

Table 4 Local Authority Costs for Household Waste Collection Services 2004 with VAT Added[5]

Rank	Local Authority	2004 Cost per Household	2005 Cost per Household (where relevant)	Comments
1	Waterford City	€ 242	€ 341	Operated Kilbarry Landfill but closed in 2004, so Costs increased for 2005
2	Fingal County	€ 299		Operated Balleally Landfill

[3] Enforcement Decision Series (No. E/05/002), Decision of the Competition Authority (Case COM/108/02), Alleged excessive pricing by Greenstar Recycling Holdings Limited in the provision of household waste collection services in northeast Wicklow. 2005.

[4] A Nationwide Review of Pay-By-Use (PBU) Domestic Waste Collection Charges in Ireland: Extensive Survey Findings (2005-WRM-MS-33) Interim Report Prepared for the Environmental Protection Agency by Department of Geography, School of Natural Sciences, Trinity College, Dublin Authors: Abigail O'Callaghan-Platt and Anna Davies (Environmental RTDI Programme 2000–2006)

[5] Costs/charges have had 13.5% VAT added to allow benchmarking against private sector charges in 2004 and current charges.

Rank	Local Authority	2004 Cost per Household	2005 Cost per Household (where relevant)	Comments
3	South Tipperary County	€ 341		Operated Donohill Landfill
4	South Dublin County	€ 348		Operated Arthurstown Landfill
5	Dublin City	€ 368		No Operational Landfill
6	Dun Laoghaire Rathdown		€ 395	No Operational Landfill
7	Galway City	€ 402		Provided 3 bin system & Operated Carrowbrowne Landfill & Compost Facility
8	Waterford County	€ 384 to €448		Cost based on 2 scenarios of using residual bin only (lower) or recycling & composting (higher)
9	Kerry County		€ 387 to €448	Operated North Kerry Landfill. Costs are estimated by KCC as system was PBU. Lower cost required home composting
10	Wexford County		€420 to €557	Operated Killurin Landfill. Lower cost is New Ross

Table 5 Charges under a Flat-Rate Waste Collection System Quoted in TCD 2005 Study

Local Authority	Annual Charge (€)
Minimum Charge per Annum	€ 300
Maximum Charge per Annum	€ 520
Mean Charge per Annum	€ 374.81

The current price in urban areas in Ireland is generally between €200 and €300 per annum and the price in rural areas is generally between €300 and €400 per annum, with some exceptions to both cases. It is clear from the data presented above that the costs and charges for kerbside household waste collection in Ireland in 2004/2005 were roughly €100 per household more expensive than current prices.

Since 2004, base costs for waste collection have increased significantly including the roll-out of a third bin, the introduction of mandatory weighing systems and increases in the landfill levy, minimum wage, insurance costs and diesel costs. The fact that household waste collection charges are now significantly lower than 2004 is, in our view, due to the following factors:

- Greater efficiencies in waste collection and treatment, including consolidation and vertical integration.
- Landfill charges with the €75 levy are lower than many of the 2004 local authority landfill charges that were artificially high.
- Lower volumes of residual waste are sent to landfill, c.20% now compared with 80% in 2004.
- The development of new infrastructure by the private sector including improved waste transfer stations, waste to energy plants, materials recovery facilities, composting plants and anaerobic digestion plants.
- Better research and engagement with International recycling markets, although this has suffered recently with the restrictions imposed by the Chinese Government.
- Engagement with the European Waste to Energy market as an alternative outlet to landfill, which has effectively capped landfill prices.
- The production of Solid Recovered Fuel (SRF) as an alternative outlet for residual waste. SRF replaces carbon fuels such as coal and pet-coke at cement kilns in Ireland.

1.0 Introduction

The Irish Waste Management Association (IWMA) commissioned SLR Consulting to benchmark the cost of household waste collection services in the Republic of Ireland (Ireland) against services offered in countries across Europe. In addition, SLR was asked to examine historical household waste collection and treatment costs in Ireland, at a time when the local authorities were heavily involved in the market.

This report is a culmination of the research and analysis undertaken by SLR. To ensure a consistent comparison against Ireland, the report focusses on countries in Europe that are not overly reliant on landfill and countries that currently achieve a relatively high recycling rate. The threshold applied and methodologies are described in further detail in subsequent sections of this report.

For these selected comparator countries, SLR has reviewed and analysed publicly available data to estimate an equivalent cost for collection and onward management of waste generated by households. To put these findings into context, this report also summarises typical household waste management provision in each of the countries considered. Where value added tax (VAT) is routinely included in the reported costs, adjustments have been made to correct for this.

Initial research was based on general feedback and data provided to SLR and to the Irish waste Management Association by other waste management associations in Europe with assistance from the European Federation of Waste Management (FEAD). Subsequently, SLR has undertaken desk-based research of its own to corroborate some of the data received from the FEAD members, referring also to information available publicly from Eurostat and other data sources.

1.1 Republic of Ireland

Household waste collection in the Republic of Ireland[6] is fully privatised with side-by-side competition that is tightly regulated by the authorities. Household waste collection largely consists of a 3-bin system (for dry recyclables, food waste and residual waste) in urban areas and a 2-bin system (for dry recyclables and residual waste only) in rural areas. There are so many different service offerings in the market that it is difficult to put a price on the average service.

Through the knowledge held internally of the waste management market, SLR estimate that the current cost of a kerbside waste management service in Ireland is generally between €200 and €400 per household per annum, including VAT at 13.5%. It is also estimated that the average cost for waste services per household in Ireland is between €250 and €300 per annum, including VAT, as the majority of customers live in urban areas where the costs are lowest.

Netting off the VAT from the average household waste costs results in a range of costs of between €220 and €264 per household per annum. It is understood that the average household in Ireland has 2.9 occupants based on 2016 data published by the Central Statistics Office (CSO). Therefore, the annual waste costs are between €76 and €91 per person excluding VAT. The midpoint of this range is €83.50 per person. Note that this is based on houses only and does not extend to apartments, where the cost of waste management per person is lower.

[6] In this report where we refer to 'Ireland' and where Eurostat data refers to 'Ireland', this means the Republic of Ireland and does not include Northern Ireland.

In terms of service, most companies in Ireland collect each waste type fortnightly, with the exception of Panda Waste Management in the Dun Laoghaire-Rathdown area, where the residual waste is collected weekly.

Analysis of the data on collection from apartments in Ireland, confidentially received from a number of large waste management companies, suggests that the average cost of waste collection and treatment per apartment is approximately €114, excluding VAT. According to the CSO data, occupied apartments in Ireland house an average of 2.03 people, which therefore suggests that the average waste cost in apartments in Ireland is approximately €56 per person.

On average in the EU28, 41.8% of people live in flats or apartments, whereas in Ireland (Ireland) it is just 7.3%, according to 2016 Eurostat data presented in Table 1-1 below.

Table 1-1 Percentage of Population Living in Flats/Apartments (Eurostat 2016 data)

Country	Percentage
Spain	66.1
Latvia	66.1
Switzerland	62.7
Estonia	62.0
Lithuania	58.2
Germany	57.1
Greece	57.1
Malta	55.0
Italy	52.5
Czech Republic	52.0
Slovakia	51.5
Iceland	48.5
Bulgaria	45.1
Sweden	45.1
Austria	45.0
Portugal	45.0
Poland	42.5
European Union (EU28)	**41.8**
Romania	36.3
Finland	34.2
France	31.5
Denmark	31.4
Hungary	31.4
Luxembourg	30.4
Slovenia	29.2
Cyprus	25.7
Serbia	24.6
Belgium	21.9
Croatia	21.0
Norway	19.7
Netherlands	18.8

Country	Percentage
United Kingdom	14.3
FYR Macedonia	13.6
Ireland	7.3

Combining the cost per person in apartments (€56) with the midpoint cost per person in houses (€83.50) and using the 7.3% for apartment living in Ireland, we estimate that the average cost per capita for waste collection and treatment in Ireland is **€81.50**.

In order to compensate for low level of apartment living in Ireland, we calculate the estimated cost per capita if 41.8% of people in Ireland lived in apartments at a cost of €56 per person and 58.2% lived in houses at a cost of €83.50 per person. This would result in a cost per capita of **€72** in Ireland.

In order to achieve a fair comparison, in other Chapters of this report we normalise the costs per capita in this way, to get a cost based on 41.8% apartment living.

Population density is another important factor in household waste collection costs. Ireland has a population density of 69 inhabitants per square kilometre; whereas the EU average is 118 inhabitants per square kilometre based on Eurostat data for 2016. We do not normalise this factor in this report, but in our conclusions, we take cognisance of the fact that collecting household waste in countries with lower population density is inherently more expensive than collecting in higher density countries.

Household waste collection in Ireland is subsidised by the national packaging producer responsibility scheme REPAK. We estimate from detailed data that the subsidy for kerbside waste collection is worth about €3 per annum per person. We know from our research that many of the other countries in the study also benefit from producer responsibility subsidies, either directly or indirectly, but we have not analysed this in detail, as it is outside the scope of our work. However, we do not believe that the impact of these subsidies would have a significant impact on the results of the benchmarking, given the relatively modest impact of the subsidy in Ireland and the availability of similar benefits in other benchmarked countries.

2.0 Methodology

In comparing household waste collection costs against European benchmarks, it is important to ensure comparator countries operate household waste management services which are broadly comparable to those on offer in the Republic of Ireland. To this end, it is important to focus on countries in Europe that do not predominantly rely on landfill, and currently achieve a relatively high recycling rate.

In addition, labour costs vary widely across Europe and it is not expected that countries with high labour costs, would have similar waste collection and treatment costs to countries that have very low labour costs. The methodology and thresholds applied to meet these requirements are set out below.

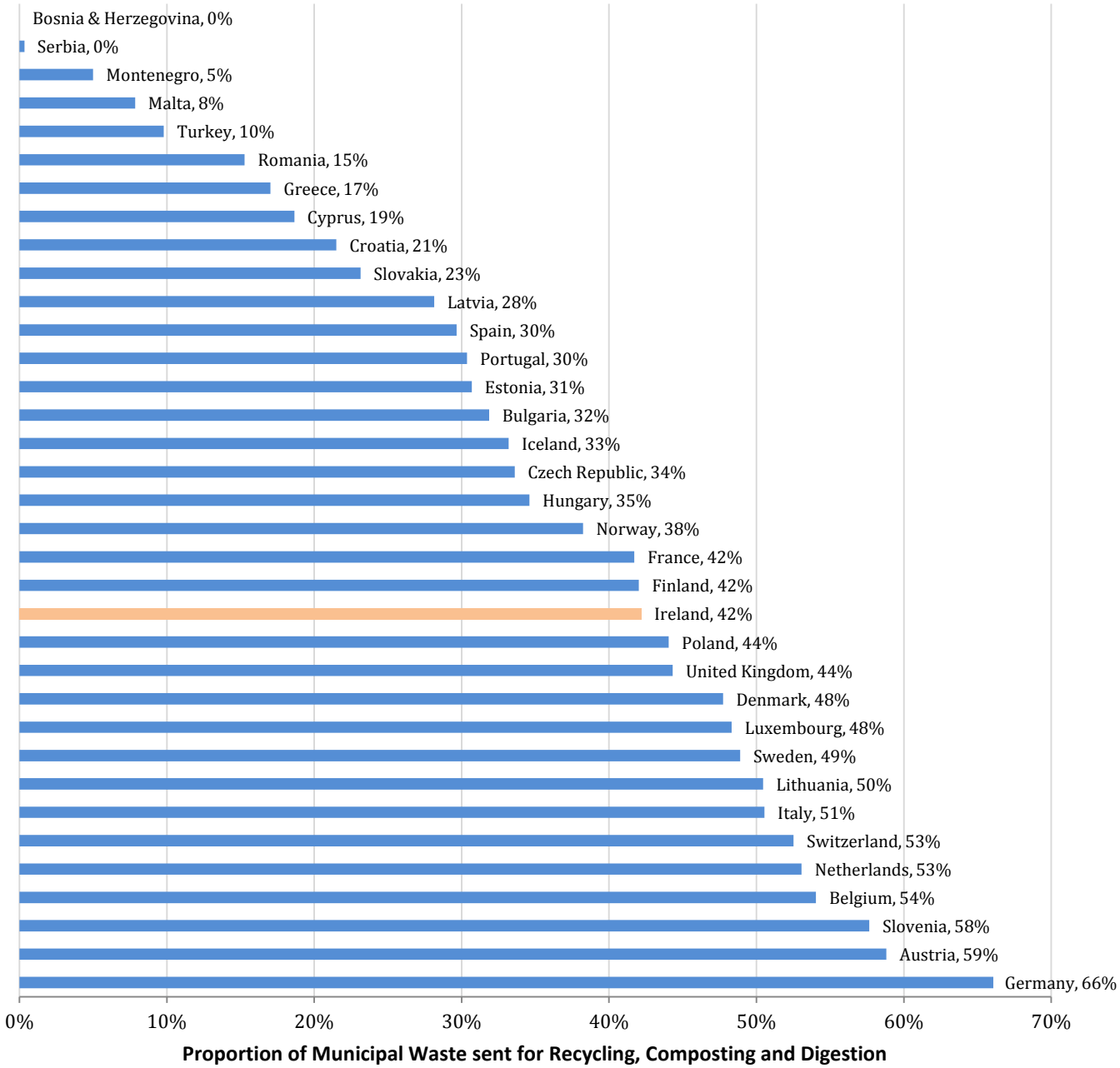
2.1 Recycling Levels

There are approximately 38 states and territories in Europe. Based on the Eurostat dataset for '*municipal waste by waste operations',* SLR has ranked the countries in order of recycling performance for 2016[7]. The data is updated every 2 years, so where no data has been recorded for 2016, the data for the previous reporting period has been used.

The ranking of European countries in order of recycling performance is presented in Figure 2-1.

[7] http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_wasmun&lang=en

Figure 2-1
Proportion of Recycling, Composting and Digestion

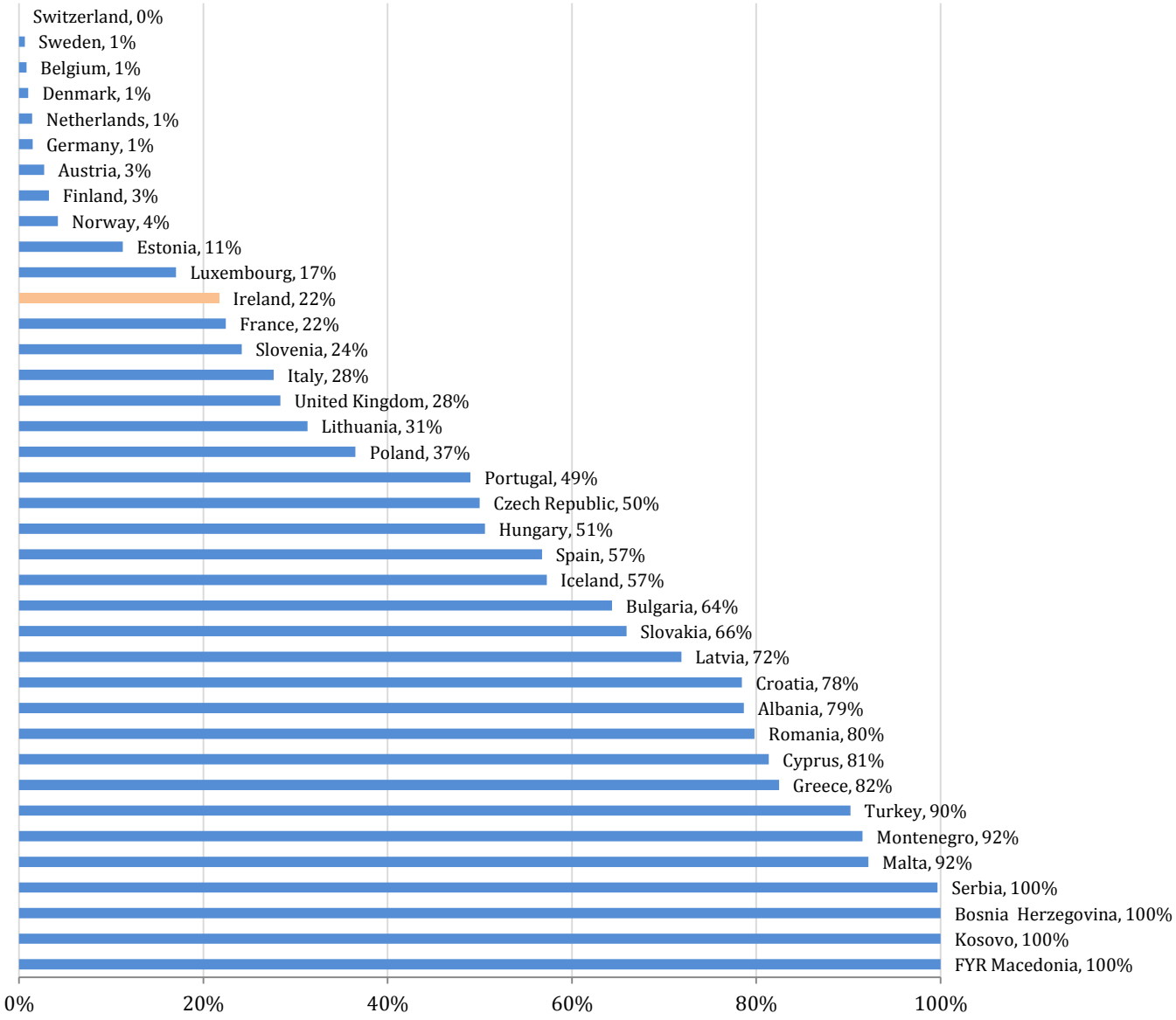


Ireland is achieving 42% municipal solid waste (MSW) recycling, according to the Eurostat data. Countries that are achieving less than 30% MSW recycling were excluded from further consideration at this stage.

2.2 Reliance on Landfill

Based on Eurostat data, SLR has also ranked the countries in order of proportion of MSW disposed to landfill in 2016, the results of which are illustrated in Figure 2-2.

Figure 2-2
Proportion of Municipal Waste Sent to Landfill



Ireland is achieving 22% landfill rate for MSW, according to the Eurostat data. Countries that are disposing more than 40% of MSW to landfill were excluded from further consideration at this stage.

2.3 Initial Shortlist of Benchmarked Countries

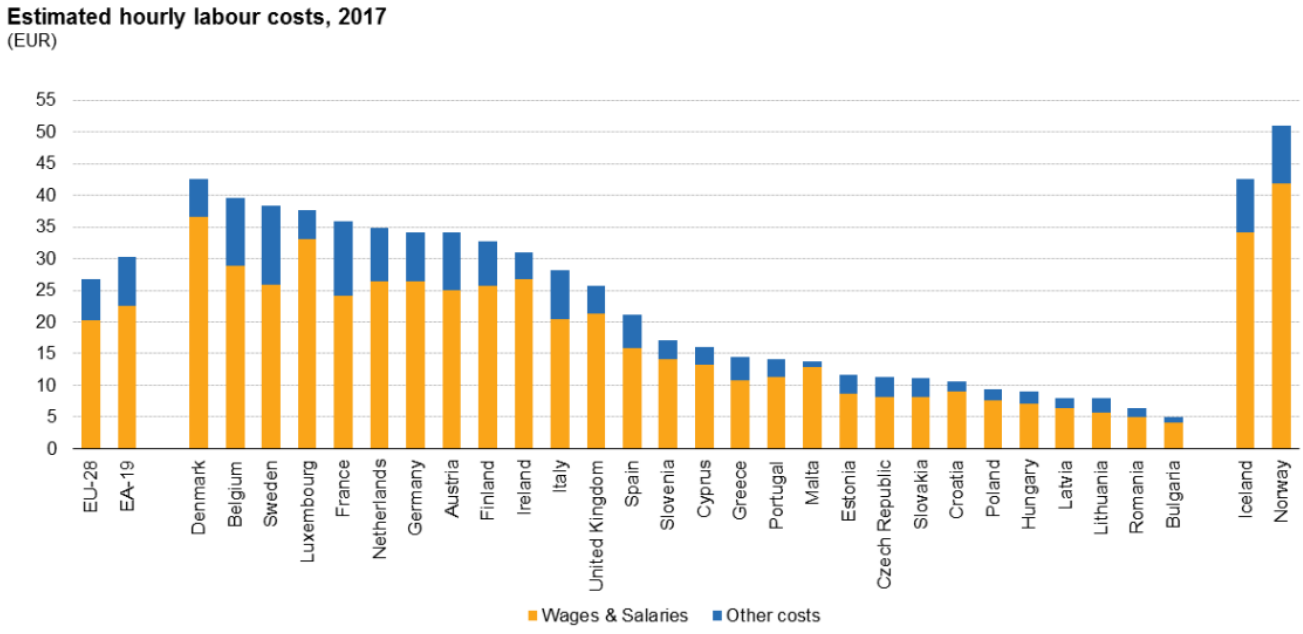
An initial shortlist of countries was drawn up at this point, excluding countries with a recycling rate of less than 30% and a rate of landfill disposal of over 40% of MSW. The result is a shortlist of the following 20 countries:

- Austria;
- Belgium;
- Denmark;
- Estonia;
- Finland;
- France;
- Germany;
- Italy;
- Lithuania;
- Luxembourg;
- Switzerland;
- Netherlands;
- Norway;
- Poland:
- Slovenia;
- Sweden;
- United Kingdom (4 countries as England, Wales, Scotland and Northern Ireland considered separately).

2.4 Labour Costs

SLR then considered the cost of labour in these countries, which is provided in Figure 2-3 below, based on Eurostat 2017 data for labour costs for enterprises of 10 or more employees.

Figure 2-3
Hourly Labour Costs in the EU in 2017



Note: whole economy (excluding agriculture and public administration); in enterprises with 10 or more employees. Provisional data.
Source: Eurostat (online data code: lc_lci_lev)

The data shows that labour costs in Ireland are €31.0 per employee per hour, compared with an EU average of €26.8. Table 2-1 below shows the 2017 estimated labour costs in each of the 17 initial shortlisted countries.

Table 2-1 Estimated Labour costs for 17 shortlisted countries (Eurostat 2017 data)

Country	2017 labour Costs
Switzerland[8]	51.3
Norway	51.0
Denmark	42.5
Belgium	39.6
Sweden	38.3
Luxembourg	37.6
France	36.0
Netherlands	34.8
Austria	34.1
Germany	34.1
Finland	32.7
Ireland	**31.0**
Italy	28.2
European Union (EU28)	**26.8**
United Kingdom	25.7
Slovenia	17.0
Estonia	11.7
Poland	9.4
Lithuania	8.0

Of the initial shortlist of countries, the following were considered to have very low labour costs compared to Ireland and were excluded from further consideration in the study:

- Slovenia €17.0
- Estonia €11.7
- Poland €9.4
- Lithuania €8.0

The following countries were considered to have very high labour costs compared to Ireland and were also excluded from the study:

- Switzerland €51.3
- Norway €51.0

We struggled to get data on Luxembourg, so that country was also excluded from the study at this point. The final shortlist of 14 countries considered in the study is as follows:

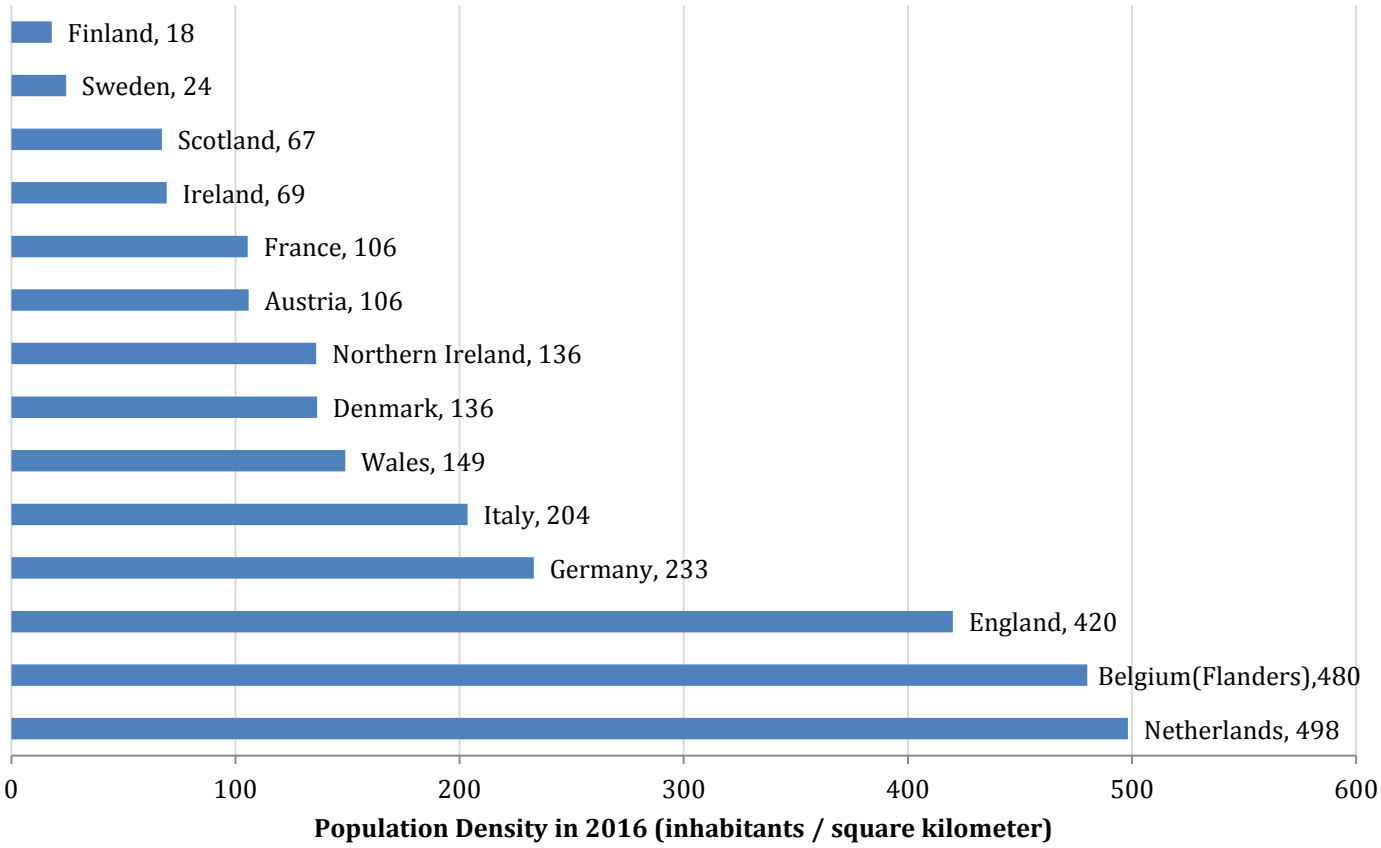
1. Austria
2. Belgium
3. Denmark
4. England
5. Finland
6. France
7. Germany
8. Italy
9. Netherlands
10. Northern Ireland
11. Rep. of Ireland
12. Scotland
13. Sweden
14. Wales

[8] Switzerland was not included in the Eurostat data, so this was sourced from www.swissinfo.ch quoting figures from the Swiss Federal statistics Office.

2.5 Population Density

As mentioned above, population density is an important factor in household waste collection costs. Population densities in the shortlisted countries are presented in Figure 2-4[9].

Figure 2-4
Population Density in the Shortlisted Countries



It is notable that Ireland's population density fall towards the low end of the European spectrum. Ireland traditionally has a high level of 'one-off' housing in the countryside and household waste collection lacks economy of density in that scenario.

Whilst Finland and Sweden have lower population densities than Ireland, there are vast areas with few or no houses in these countries and we assume that those areas are not served by kerbside household waste collection services. So in reality the population density served by kerbside waste collection in Finland and Sweden is higher than the data suggests.

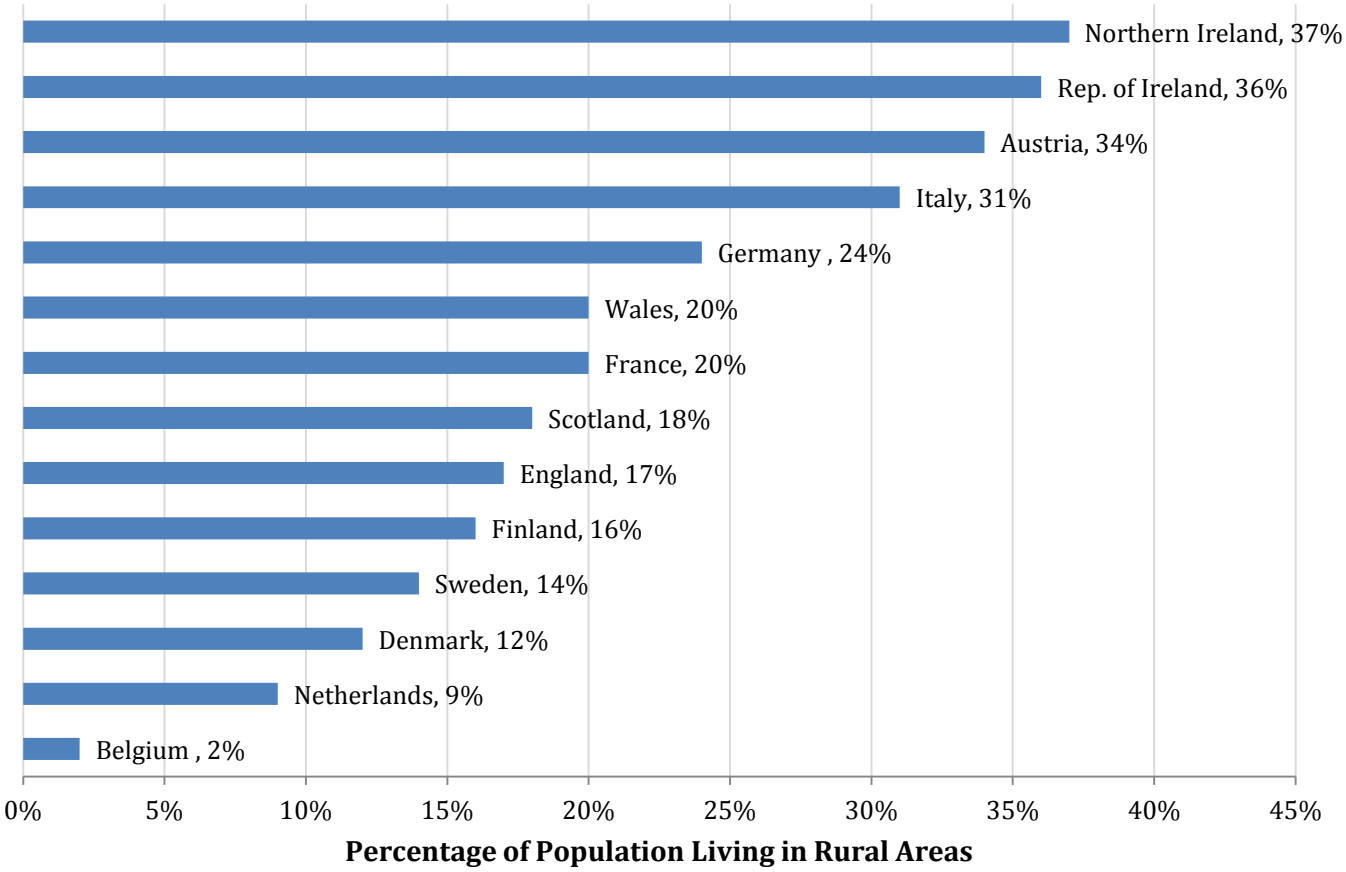
2.6 Rural versus Urban Population

Collecting household waste from kerbsides in urban areas is a lot more cost effective than collecting in rural areas, due to economies of density and scale. We use World Bank statistics[10] to estimate the percentage rural

[9] Mostly from http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tgs00024&plugin=1

population in each of the shortlisted countries in 2016, as presented in Figure 2-5 below. The World Bank figure for the UK is 17% rural population, but we used local sources[11] for each of the UK countries, as there are significant differences in the demographics of these countries.

Figure 2-5
Rural Population in the Shortlisted Countries



The data shows that Ireland, North and South, has a high percentage of people living in rural areas compared with the other benchmarked countries. Austria and Italy also have a relatively high proportion of the population living in rural areas. In contrast, Belgium is particularly urban, according to the World Bank data.

[10] See https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS

[11] NISRA for Northern Ireland. National Records of Scotland. Welsh Government. DEFRA.

3.0 Household Waste Collection Costs and Services in Other European Countries

This chapter presents the waste management costs and collection services in each of the shortlisted European countries.

3.1 England

3.1.1 Waste Management Costs

In seeking to establish waste management costs for England, SLR has referred to the dataset of budget estimates of local authority revenue, expenditure and financing for 2017/18 published by the Ministry for Housing, Communities and Local Government (MHCLG)[12].

Simplistically summing revenue expenditure reported by MHCLG for waste collection, waste disposal, recycling and waste minimisation activities (trade waste in particular being excluded), gives a total expenditure of £3.64 bn. for waste services in England. However, to provide a fully inclusive cost which is comparable to the benchmarked service in Ireland, it is necessary to apply the following adjustments:

- MHCLG data is inclusive of expenditure on household waste and recycling centres (HWRCs, commonly known as civic amenity sites). While no separate itemisation is available for the cost of HWRCs in England, data published by the Welsh Government Association[13] indicates that HWRC service account for 17% of local authority waste service expenditure. Applying this reduction factor, gives an estimate of £3.02 billion.
- It is understood that MHCLG dataset excludes council expenditure on administrative services which support the collection and treatment of household waste. In total, MHCLG report a 'central services' budget of £2.99 bn. No published data exists on the proportion of this total which is attributable to waste management services. Indicatively however, examining the detail of this budget, we estimate that expenditure on waste management services amounts to 4% of total expenditure on local authority public services in England. Applying this 4% factor, it is estimated that circa £120 million of the central services cost is associated administrative support to waste management. Coincidentally, this amounts to 4.0% of the quoted waste costs.
- In deriving costs from the MHCLG 2017/18 cost dataset, it is also important to note that expenditure on capital is aggregated under a separate heading (i.e. the reported £3.64 bn revenue expenditure is not inclusive of all capital items). Previously, MHCLG has published service specific capital costs in 2013/14, and this earlier dataset indicates that waste management accounts for 2.3% of the capital spend total. Applying this factor to the reported total £9.37 bn capital spend in 2017/18, 2017/18 capital expenditure on waste services in England is estimated at £210 million.
- Applying corrections for central administrative services and capital expenditure, a combined total of £3.35 bn on household kerbside waste services is estimated.

[12] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/623097/RA_2017-18_data_by_LA.xlsx

[13] http://www.wlga.wales/SharedFiles/Download.aspx?pageid=62&mid=665&fileid=706

- Data published by the Office for National Statistics (ONS) indicates that England had a population of approximately 55.6 million in 2017/18[14], suggesting a per capita waste service expenditure of £60.25 per person.

In our analyses of the UK countries, we have data from a number of years during which the value of sterling has been quite volatile in response to the planned Brexit. The average exchange rate over the last 5 years has been €1.224 to £1 sterling, so we use this figure consistently in this report when addressing the UK countries. Applying the exchange rate of EUR 1.224 per GBP, this equates to an average expenditure of **€73.75** per person.

In order to benchmark the collection costs with Ireland, we adjust for apartment versus houses in each country. Based on data from Ireland, the cost per capita of collecting from houses is roughly 1.5 times more expensive than the cost of collecting from apartments. According to the Eurostat data quoted earlier in this report, 14.1% of people in the UK live in flats or apartments compared to 41.8% on average in the EU. Adjusting for this factor, if England had 41.8% of people living in apartments, the adjusted cost per capita would be **€66.65**.

3.1.2 Waste Collection Services

The Waste and Resources Action Programme (WRAP) publishes a list annually showing the kerbside waste collection schemes offered by local authorities across the UK. The most recent dataset presents kerbside waste collection schemes for 2016/17[15]. SLR has reviewed the WRAP data and analysed the figures for England.

As shown in Figure 3-1 and Figure 3-2 there is considerable variation in the collection service offering for households across England. The majority of households (64%) have their residual waste collected fortnightly; 33% have weekly collections, while 3% have collections at other frequencies.

[14] https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/datasets/localauthoritiesinenglandtable2

[15] http://laportal.wrap.org.uk/Statistics.aspx

Figure 3-1
Waste Collection Frequency in England

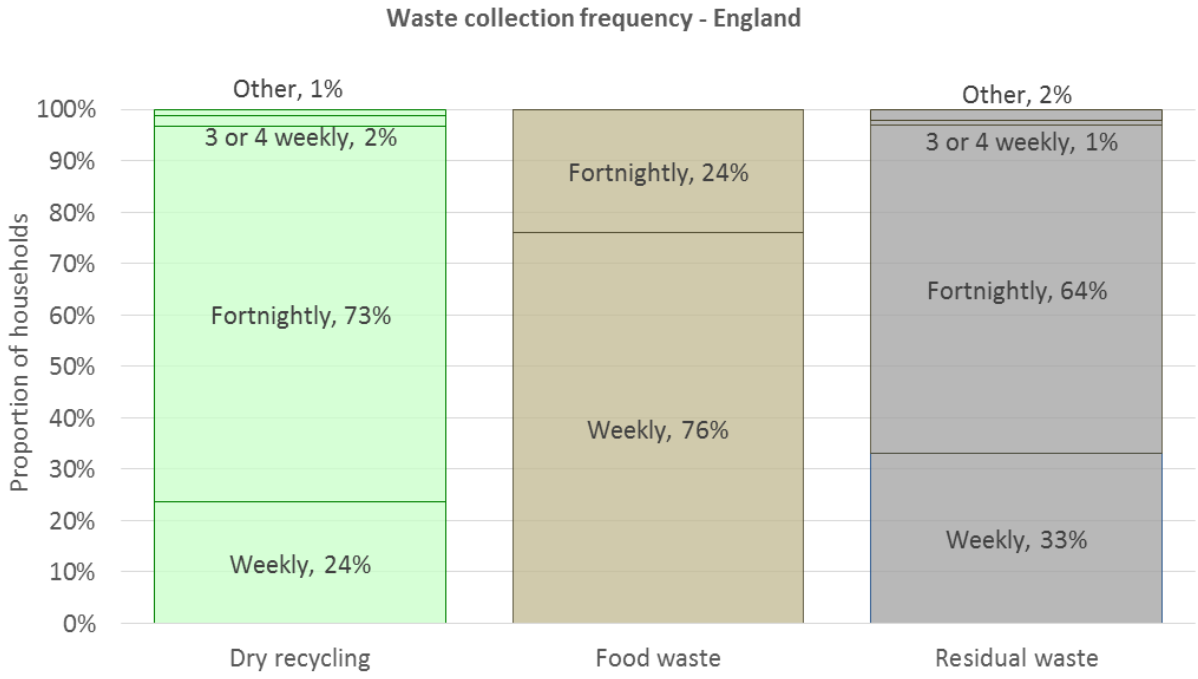
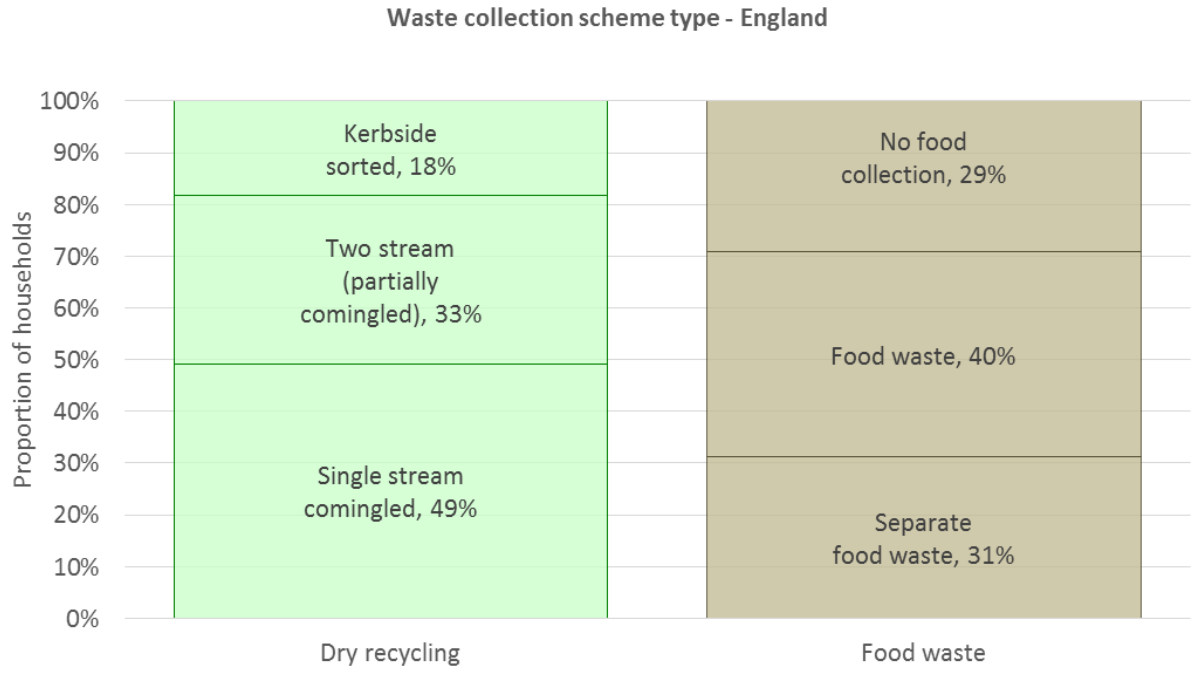


Figure 3-2
Waste Collection Scheme Type in England

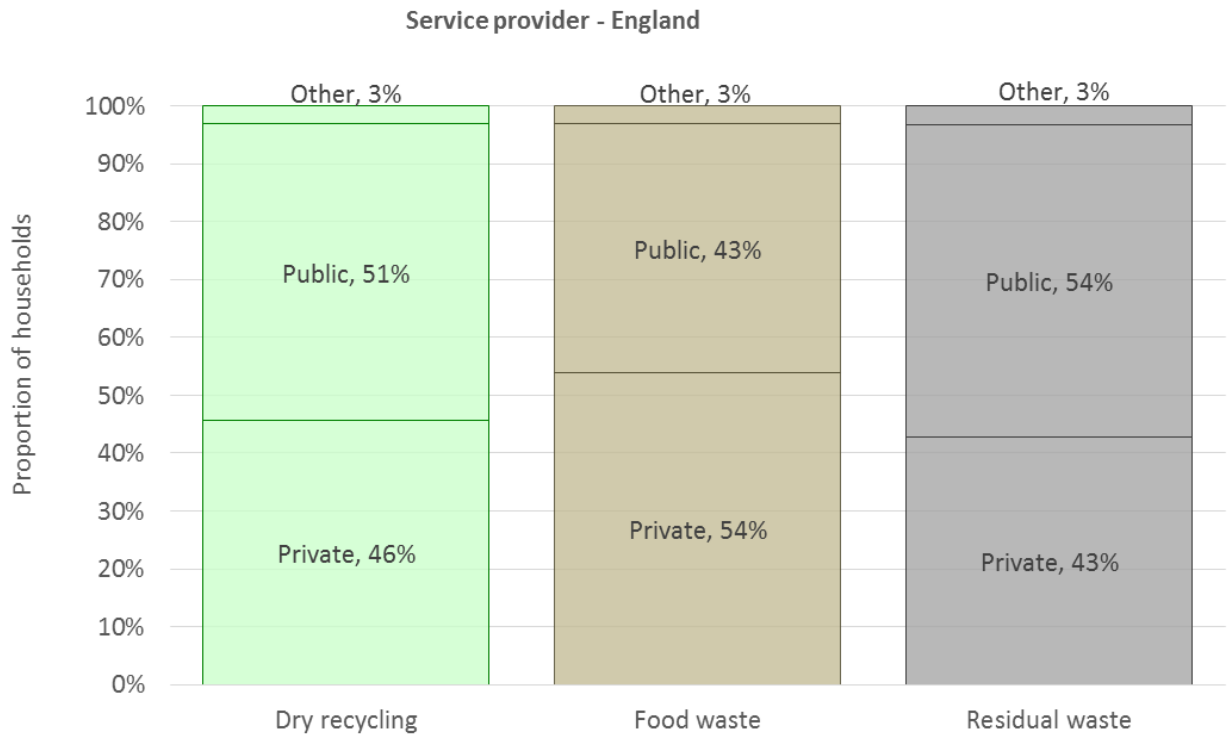


With regards to food waste, 31% of properties have separate food waste collections; 40% have mixed collections (i.e. food and garden waste combined), while 29% of properties have no food waste collections at all[16]. Of the properties that have some form of kerbside food waste collection, 76% have this collected weekly and the remainder have their food waste collected fortnightly.

For the collection of dry recycling, 73% of properties have their dry recycling collected fortnightly; 24% have material collected weekly, while 3% of properties have collections at other frequencies. The majority of properties (49%) have a comingled collection; 33% of properties have a two stream partly comingled collection and the remainder (18%) have a kerbside sorted collection scheme.

As shown in Figure 3-3, there is almost an even split in the proportion of waste and recycling collections across England provided by public bodies and private waste management companies, with about 3% of collections provided by third sector organisations such as community groups and social enterprises.

Figure 3-3
Waste Collection Service Provider in England



[16] London Borough of Sutton have answered 'none' to the question of whether there is a separate food waste collection; however it is understood that the Council does offer this service.

3.2 Scotland

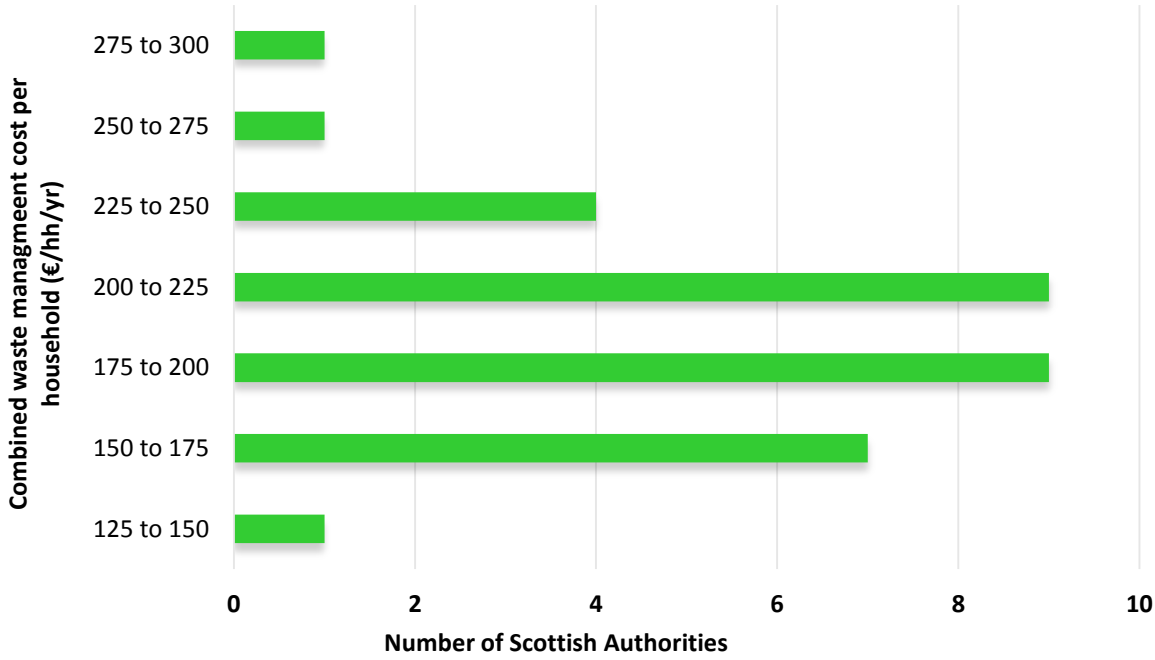
3.2.1 Waste Management Costs

In seeking to establish waste management costs for Scotland, SLR has referred to the most recent published dataset for local government benchmarking data for 2016/17 published by the national improvement service for local government in Scotland[17]. These figures are sourced directly from the Scottish Government's Local Finance Return (LFR) which is completed by Councils each year[18]. The information of relevance to this study pertains to waste collection costs and waste disposal costs exclusive of VAT, as reported under the following key performance indicators:

- ENV1a – net expenditure for waste collection per property; and
- ENV2a – net expenditure for waste disposal per property.

This dataset covers 32 local authorities and analysis of the waste management costs in 2016/17 shows that costs were lowest in the Shetland Islands at £117.46 (€143.78) per property, and highest in Argyll and Bute at £231.55 (€283.41) per property. It is however notable that analysis of the dataset shows that the majority of local authorities in Scotland reported waste management costs of €175 to €225 per property per year as shown in Figure 3-4.

Figure 3-4
Waste Management Costs per Household in Scotland



The dataset shows that the average waste management costs in 2016/17 were approximately £161.31 (€199.89) per property (i.e. £64.54 for collection and £98.77 for disposal).

[17] http://www.improvementservice.org.uk/documents/benchmarking/1617rawdata.xlsx
[18] http://www.gov.scot/Topics/Statistics/Browse/Local-Government-Finance/ReturnLFR

In total, reported Scottish local authority expenditure on waste collection and disposal in 2016/17 amounts to £431M. As per the case of England, it is understood that local authority waste management costs reported in Scotland are inclusive of the cost of operation of HWRCs. Applying a reduction of 17%, again derived from HWRC operation costs reported in Wales, leaves a combined cost of £357.7M.

As mentioned previously, the reported figures account for the costs associated with the collection and disposal of waste managed by local authorities in Scotland. The figures will include staff costs for those working directly within waste management but exclude elements which are defined as support costs. The local governance structures in each Council will dictate what are classified as support costs. The LFR have issued guidance in this regard which suggests that costs associated with the finance, legal, human resources, information technology, internal audit, procurement and asset management departments should be regarded as support costs[19]. Scottish datasets however provide no clear basis to estimate this unquantified support element. Therefore, to be consistent with England, we add 4%[20] to cover those costs, so the total cost of kerbside household collection in Scotland is estimated at £372M.

Dividing by Scotland's population in 2016, estimated by National Records of Scotland at 5.38M, indicates a household waste management cost of £69.14 per person. At the 5 year average EUR 1.224 per GBP exchange rate, this converts to **€84.63** per person.

In order to benchmark the collection costs with Ireland, we adjust for apartment versus houses in each country. Based on data from Ireland, the cost per capita of collecting from houses is roughly 1.5 times more expensive than the cost of collecting from apartments. According to the Eurostat data quoted earlier in this report, 14.1% of people in the UK live in flats or apartments compared to 41.8% on average in the EU. Adjusting for this factor, if Scotland had 41.8% of people living in apartments, the adjusted cost per capita would be **€76.48**.

3.2.2 Waste Collection Services

The Waste and Resources Action Programme (WRAP) publishes a list annually showing the kerbside waste collection schemes offered by local authorities across the UK. The most recent dataset presents kerbside waste collection schemes for 2016/17[21].

SLR has analysed this data for Scotland, and as shown in Figure 3-5 and Figure 3-6, there is considerable variation in the collection service offering for households across Scotland. The majority of households (71%) have their residual waste collected fortnightly; 13% have weekly collections, while 8% have 3 or 4 weekly collections.

[19] http://www.gov.scot/Topics/Statistics/Browse/Local-Government-Finance/ReturnLFR/LFR2015-16supportcosts

[20] In the England case, this was £120M out of £3.02Bn = 4.0%

[21] http://laportal.wrap.org.uk/Statistics.aspx

Figure 3-5
Waste Collection Frequency in Scotland

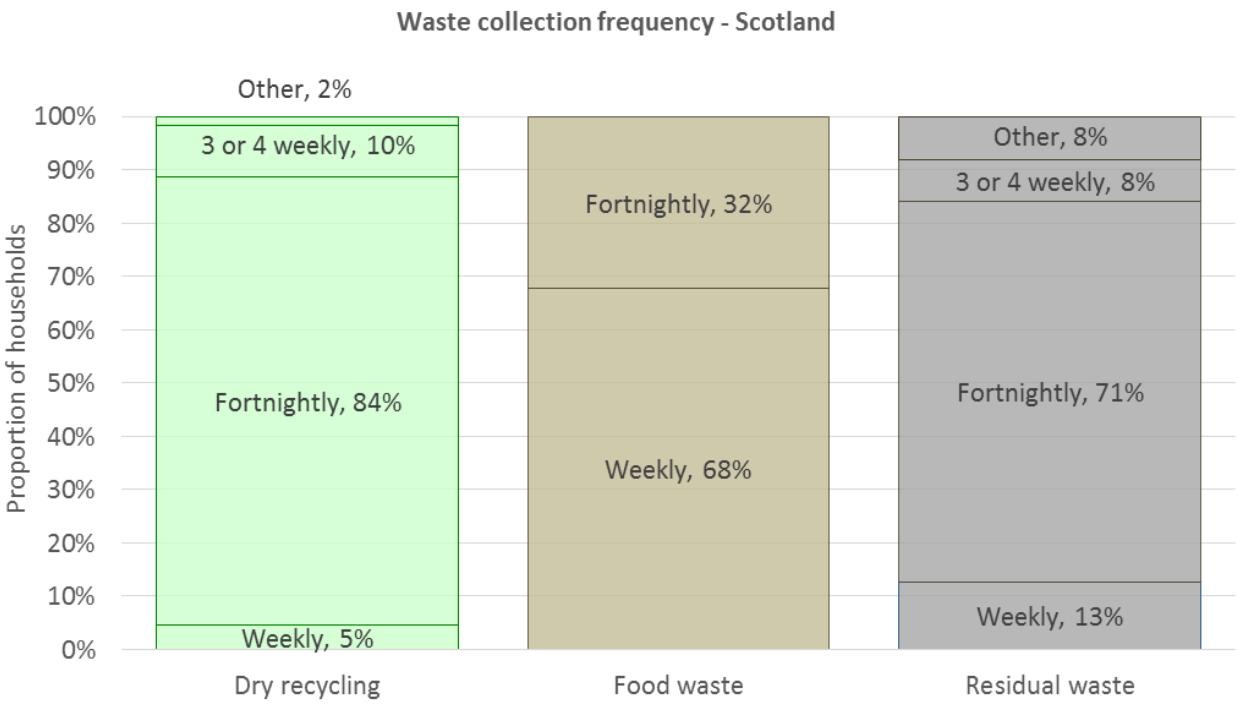
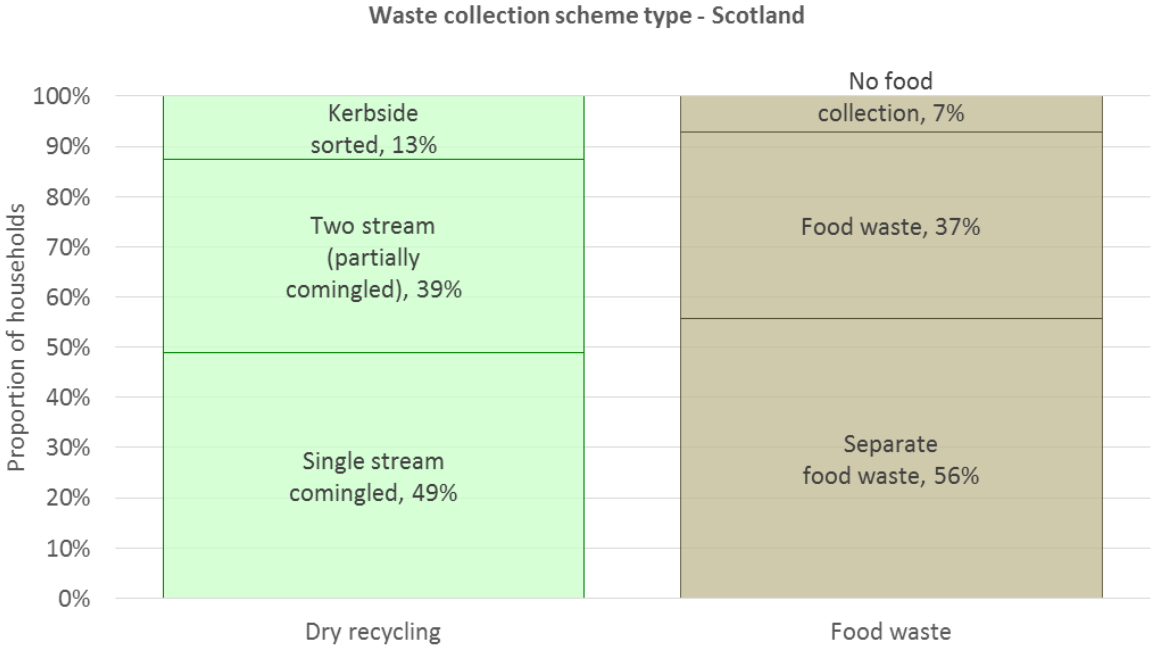


Figure 3-6
Waste Collection Scheme Type in Scotland

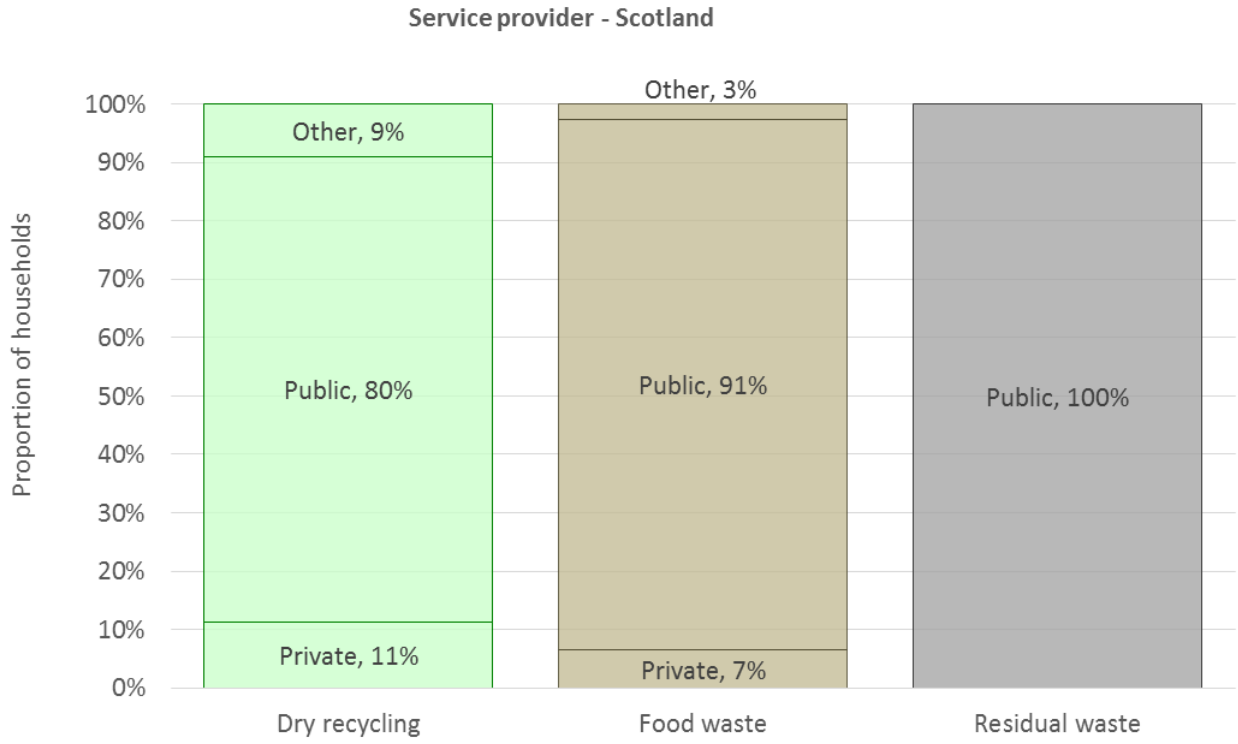


With regards to food waste, 56% of properties have separate food waste collections; 37% have mixed collections (i.e. food and garden waste combined), while 7% of properties have no food waste collections at all. Of the properties that have some form of kerbside food waste collection, 68% have this collected weekly and the remainder have their food waste collected fortnightly.

For the collection of dry recycling, 84% of properties have their dry recycling collected fortnightly; 10% have material collected 3 or 4 weekly, while 5% of properties have weekly collections. The majority of properties (49%) have a comingled collection; 39% of properties have a two stream partly comingled collection and the remainder (13%) have a kerbside sorted collection scheme.

As shown in Figure 3-7, waste and recycling collections across Scotland are typically provided by public bodies – either in-house or by a Direct Services Organisation (DSO). Other bodies offering waste and recycling collections include private waste management companies and third sector organisations (e.g. community groups and social enterprises).

Figure 3-7
Waste Collection Service Provider in Scotland



3.3 Wales

3.3.1 Waste Management Costs

In seeking to establish waste management costs for Wales, SLR has referred to the report 'Waste Finance Data Report 2015-16' published by the Welsh Local Government Association (WLGA)[13]. This report provides high level costs for the collection and processing of dry recycling, residual and organic waste. It also provides costs for the operation of civic amenity sites and bring sites across Wales, although these costs are excluded from the analysis for the purposes of this study, to provide a like-for-like estimate against the Irish household kerbside system cost. The information of relevance to this study pertains only to waste costs associated with collection, recycling and disposal of dry recycling, residual waste and organic waste, as well as capital depreciation, which we believe is included in the data. Again, the costs presented are exclusive of VAT.

According to the WLGA, the total waste management costs for Wales in 2015/16 were approximately £228.5 million. However, the cost associated with the collection, recycling and disposal of dry recycling, residual waste and organic waste in 2015/16 was approximately £187 million (i.e. excluding operation of civic amenity sites and bring sites).

We understand that the reported figures do not account for shared support costs, such as finance, legal, human resources, information technology, internal audit, procurement and asset management. To be consistent with other UK countries, we add 4% to cover those costs, so the total cost of kerbside household collection in Wales is estimated at £194.5M.

Data published by StatsWales shows that Wales had a population of approximately 3.1 million in 2015/16[22]. Therefore, the waste management costs per capita in 2015/16 are estimated to have been approximately £62.74 per person. Applying the 5 year average exchange rate of 1.224 euro per GBP, this equates to **€76.80** per person.

In order to benchmark the collection costs with Ireland, we adjust for apartment versus houses in each country. Based on data from Ireland, the cost per capita of collecting from houses is roughly 1.5 times more expensive than the cost of collecting from apartments. According to the Eurostat data quoted earlier in this report, 14.1% of people in the UK live in flats or apartments compared to 41.8% on average in the EU. Adjusting for this factor, if Wales had 41.8% of people living in apartments, the adjusted cost per capita would be **€69.41**.

3.3.2 Waste Collection Services

Referring again to the WRAP kerbside waste collection scheme data, SLR has analysed the figures for Wales. As shown in Figure 3-8 and Figure 3-9, there is some variation in the collection service offering for households across Wales, but not as much as noted for England or Scotland. The majority of households (86%) have their residual waste collected fortnightly, while 14% have 3 or 4 weekly collections.

[22] https://statswales.gov.wales/Catalogue/Population-and-Migration/Population/Estimates/Local-Authority/populationestimates-by-localauthority-year

Figure 3-8
Waste Collection Frequency in Wales

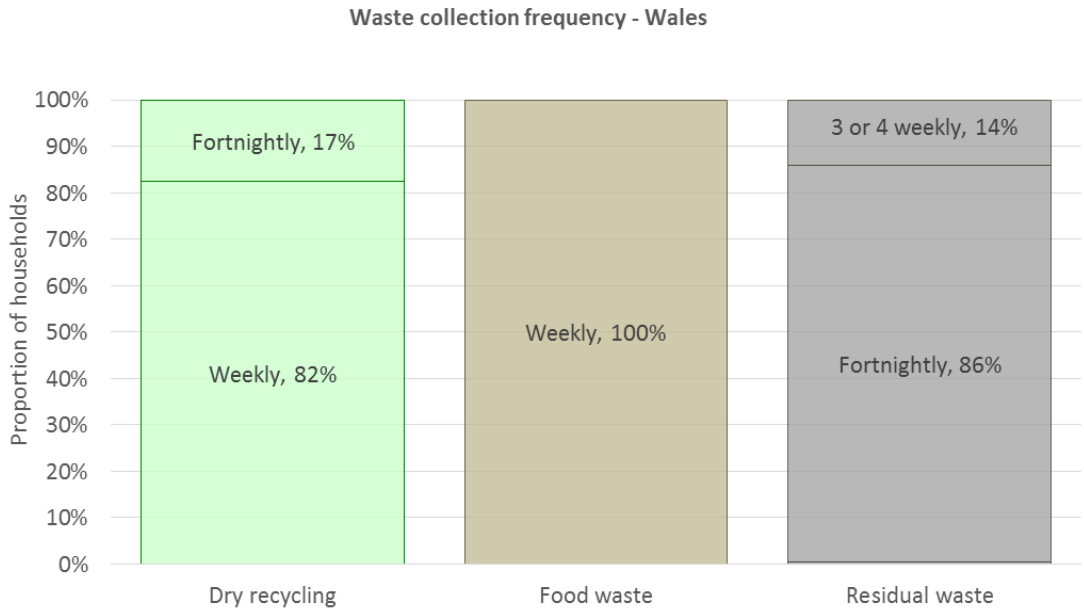
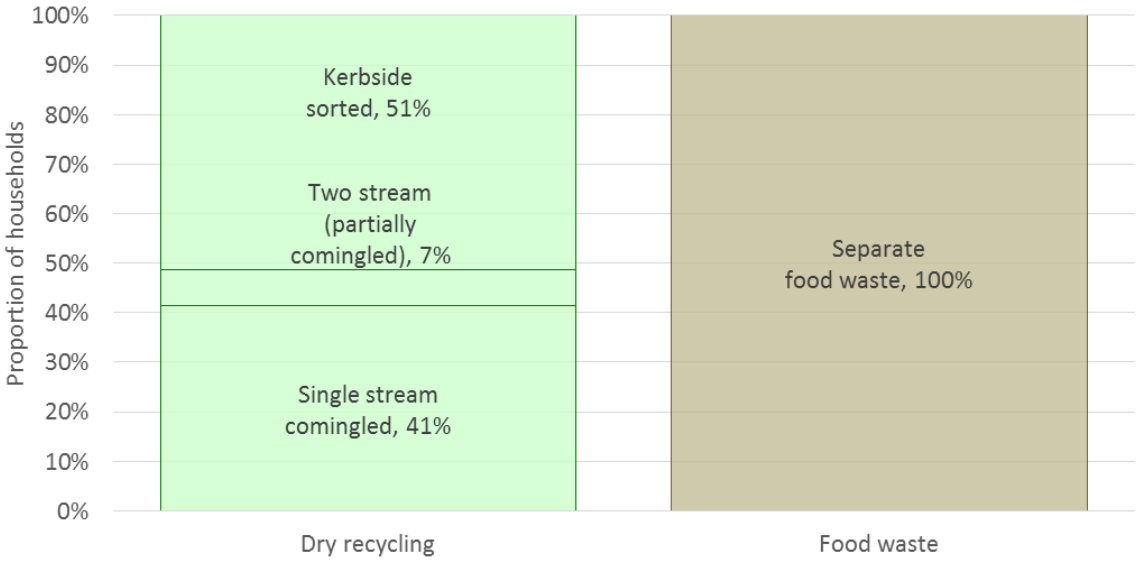


Figure 3-9
Waste Collection Scheme Type in Wales

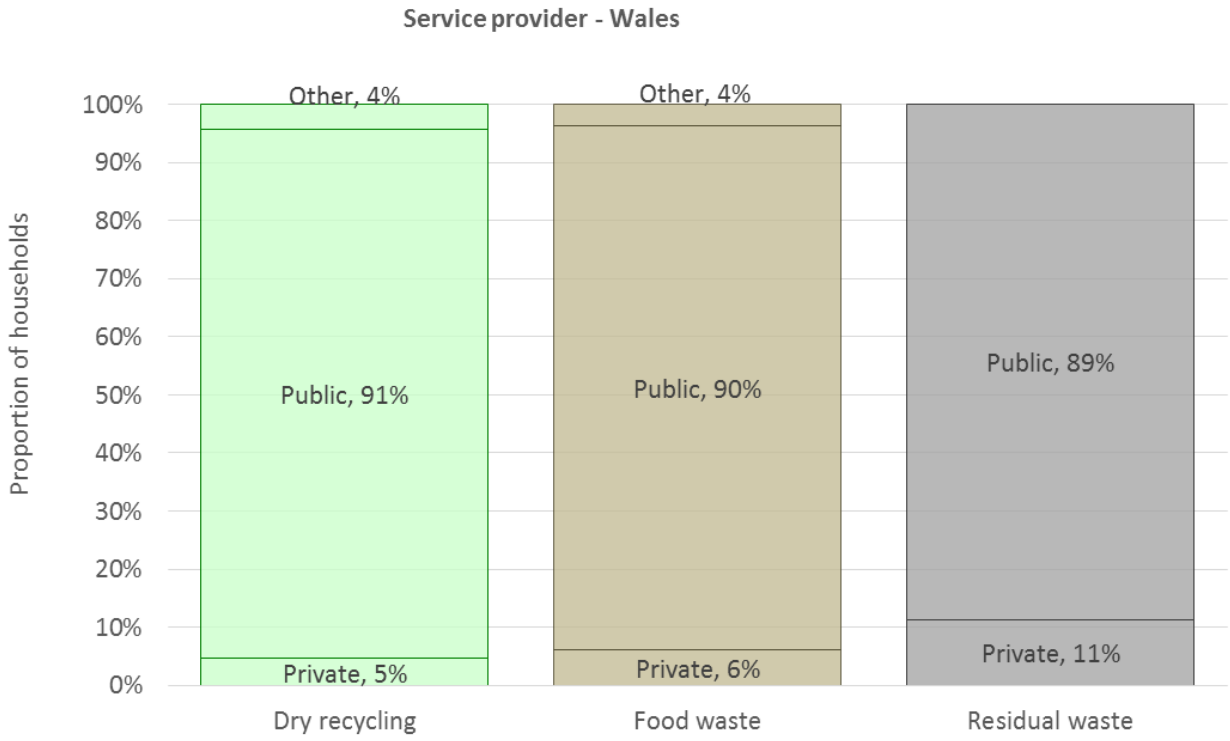


With regards to food waste, all local authorities in Wales are known to offer separate food waste collections on a weekly basis[23].

For the collection of dry recycling, 82% of properties have their dry recycling collected weekly, while 17% have material collected fortnightly. The majority of properties (51%) have a kerbside sorted collection scheme; 41% have a comingled collection and the remainder (7%) have a two stream partly comingled collection scheme.

As shown in Figure 3-10, the majority of waste and recycling collections across Wales are provided by public bodies (~90%) with the remainder provided by private waste management companies (via a competitive tendering process) and third sector organisations such as community groups and social enterprises.

Figure 3-10
Waste Collection Service Provider in Wales



[23] Summary of WRAP data indicates that all households are offered a food collection service, though in practice there may be some more challenging premises where this is not the case.

3.4 Northern Ireland

3.4.1 Waste Management Costs

In seeking to establish waste management costs for Northern Ireland, SLR received 2016/17 data via a Freedom of Information request to the Local Government & Housing Regulation Division of the Department of Communities in Northern Ireland. The data consisted of details of outturn 2016/17 waste management expenditure by the 11 local authorities with responsibility for waste management in Northern Ireland. This was divided into the following 3 categories:

- Waste Collections – Total spend of £106,418,210
- Waste Disposal – Total spend of £68,034,473
- Other Cleaning – Total spend of £45,562,533

All these figures are exclusive of VAT.

We include the 'Waste Collection' costs fully in our analysis and we exclude the 'Other Cleaning' costs. From follow-up queries to one authority in Northern Ireland, we were advised that the 'Waste Disposal' costs include costs related to Civic Amenity sites (HWRC sites) and that these are generally 25%, with the exception of Derry & Strabane where they are approximately 40% of the these disposal costs. We therefore, discounted those costs, leaving a total cost of waste collection and disposal for kerbside household waste in Northern Ireland of £156M. We were also informed that the costs of staffing and managing the HWRC sites is counted outside of the figures quoted above.

With a population in Northern Ireland of c.1.875 million people, we estimate that the cost of kerbside household waste collection and treatment is £83.20 per capita. Using the 5 year average conversion rate discussed earlier, this is estimated at **€101.84** per capita.

In order to benchmark the collection costs with Ireland, we adjust for apartment versus houses in each country. Based on data from Ireland, the cost per capita of collecting from houses is roughly 1.5 times more expensive than the cost of collecting from apartments. According to the Eurostat data quoted earlier in this report, 14.1% of people in the UK live in flats or apartments compared to 41.8% on average in the EU. Adjusting for this factor, if Northern Ireland had 41.8% of people living in apartments, the adjusted cost per capita would be **€92.04**.

3.4.2 Waste Collection Services

Referring again to the WRAP kerbside waste collection scheme data, SLR has analysed the figures for Northern Ireland. As shown in Figure 3-11 and Figure 3-12, there is some variation in the collection service offering for households across Northern Ireland, but considerably less than any of the other countries that make up the United Kingdom. The data shows that all households have their residual waste collected fortnightly.

Figure 3-11
Waste Collection Frequency in Northern Ireland

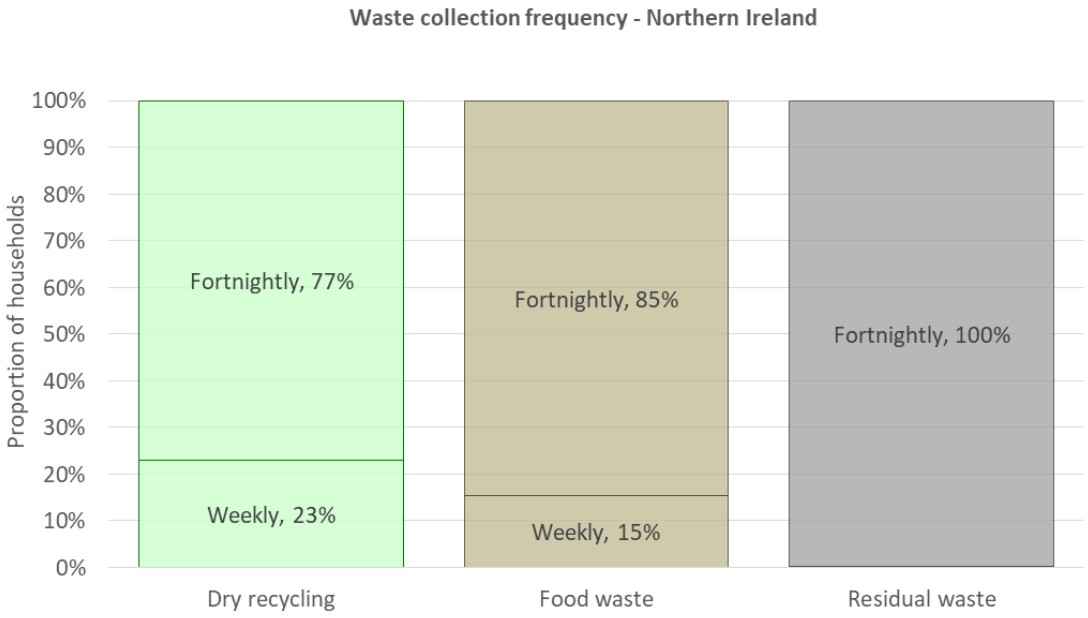
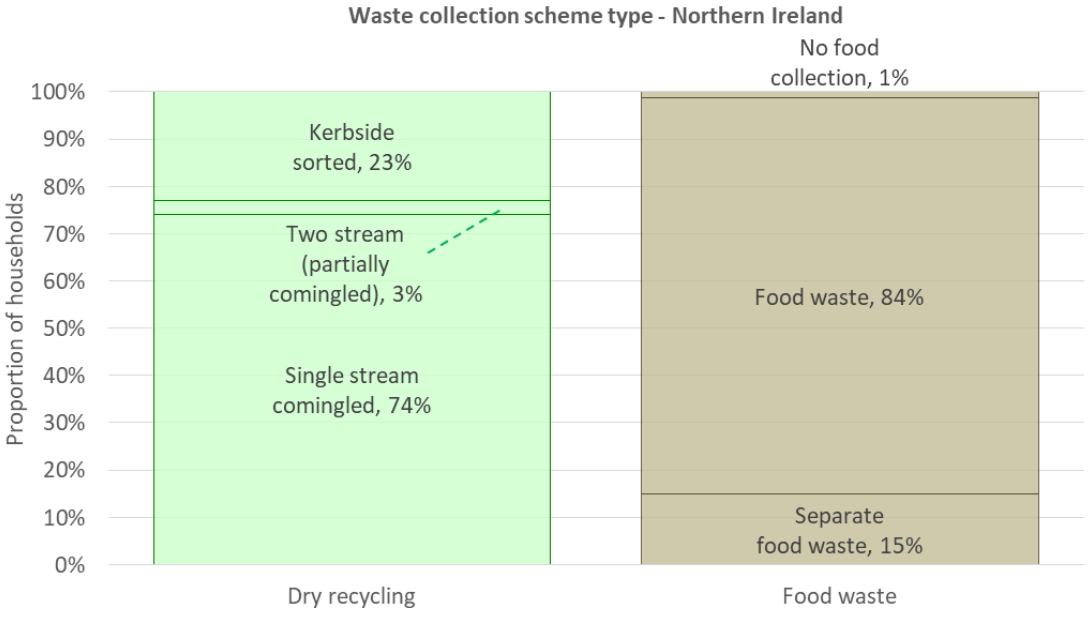


Figure 3-12
Waste Collection Scheme Type in Northern Ireland

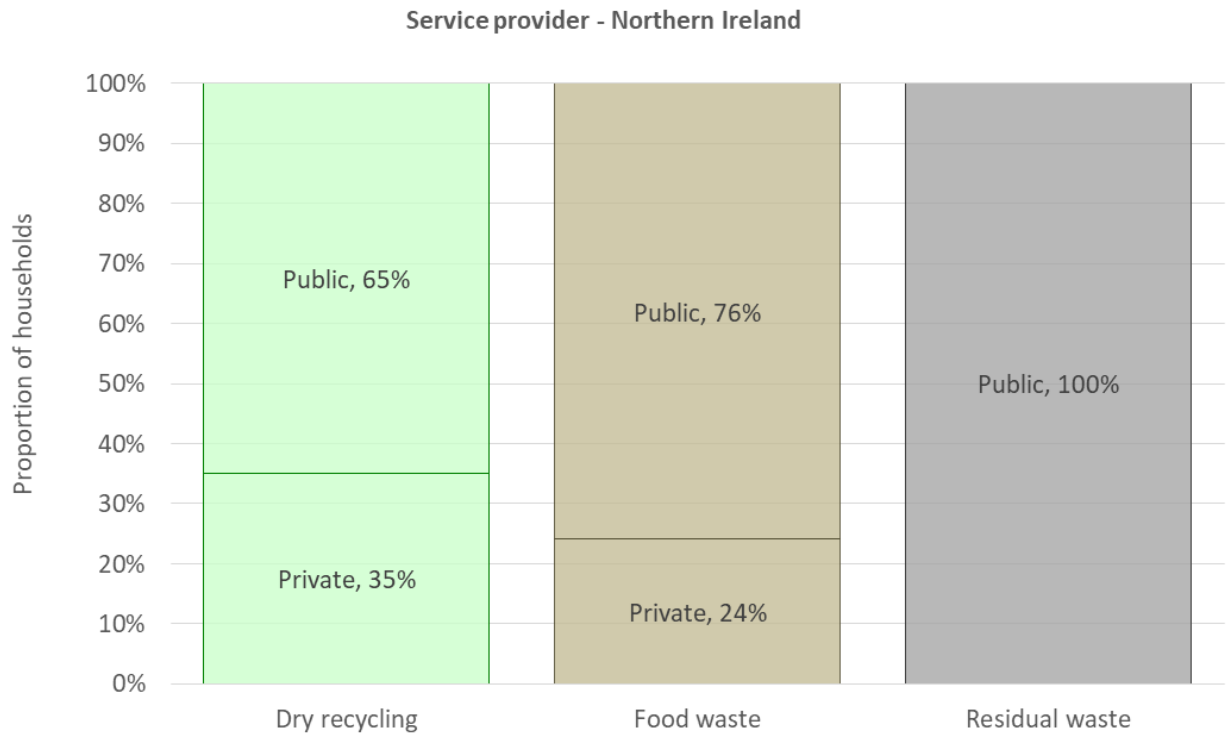


With regards to food waste, 15% of properties have separate food waste collections; 84% have mixed collections (i.e. food and garden waste combined), while 1% of properties have no food waste collections at all. Of the properties that have some form of kerbside food waste collection, 15% have this collected weekly and the remainder have their food waste collected fortnightly.

For the collection of dry recycling, 23% of properties have their dry recycling collected weekly, while 77% have material collected fortnightly. The majority of properties (74%) have a comingled kerbside collection scheme; 23% have a kerbside sorted collection and the remainder (3%) have a two stream partly comingled collection scheme.

As shown in Figure 3-13, all residual waste collections and the majority of recycling collections across Northern Ireland are provided by public bodies. For dry recycling, 35% of households have their collections provided by private waste management companies; while for food waste, this is down to only 24% of households that have their collections provided by private waste management companies.

Figure 3-13
Waste Collection Service Provider in Northern Ireland



3.5 Denmark

3.5.1 Waste Management Costs

In seeking to establish the waste management costs for Denmark, SLR has referred to a report published by Deloitte for the Ministry of Environment[24]. The report summarises the results of household surveys undertaken in 2013 to form a better understanding of waste and recycling costs across the country.

The report shows that a total of 66 out of 98 municipalities answered the questionnaire. Collectively, the municipalities received replies covering approximately 1.9 million households – approximately 71% of all households in the country. Of the municipalities that responded, the report shows that the waste costs per household varied between DKK 1,150 and 3,500 (Danish Krone). Approximately 80% of the municipalities that responded had an annual fee of between DKK 1,500 and 3,000. The average cost per household was DKK 2,100 across all municipalities that responded to the survey (~€282/hh)[25].

The average household occupancy rate in Denmark in 2013 was approximately 2.1 people per household according to Eurostat[26], indicating that the overall cost for household waste collection and disposal amounts to approximately **€134.29** per person.

In order to benchmark the collection costs with Ireland, we adjust for apartment versus houses in each country. Based on data from Ireland, the cost per capita of collecting from houses is roughly 1.5 times more expensive than the cost of collecting from apartments. According to the Eurostat data quoted earlier in this report, 31.4% of people in Denmark live in flats or apartments compared to 41.8% on average in the EU. Adjusting for this factor, if Denmark had 41.8% of people living in apartments, the adjusted cost per capita would be **€129.09**.

3.5.2 Waste Collection Services

It is understood that waste management is the responsibility of the municipalities in Denmark and that householders pay a fee to cover the cost of services delivered. The fee covers the collection, treatment, recovery and disposal of household waste and varies depending on the service provision in the respective municipality. The fees charged also vary depending on the services provided to a particular property – typically households in multi-storey buildings will have lower fees than those in single family houses.

Due to the relative autonomy of municipalities, waste collection services offered vary across Denmark. However, legislation (the 'Statutory Order on Waste') mandates specific minimum requirements for waste collection services. These include:

- provision for the collection of recyclable metal and plastic waste;
- collection of paper and cardboard, where settlements exceed one thousand persons; and
- collection of glass packaging where settlements exceed two thousand inhabitants.

It is understood that collection of organic waste (i.e. food and garden waste) is not mandated, though this is a focus of the Danish National Waste Management Plan.

[24] http://genanvend.mst.dk/media/131206/kortlaegning-af-gebyrstrukturer-paa-affaldsomraadet-final-2.pdf

[25] The reported average 2013 exchange rate of DKK 1 to Euro 0.134 is assumed.

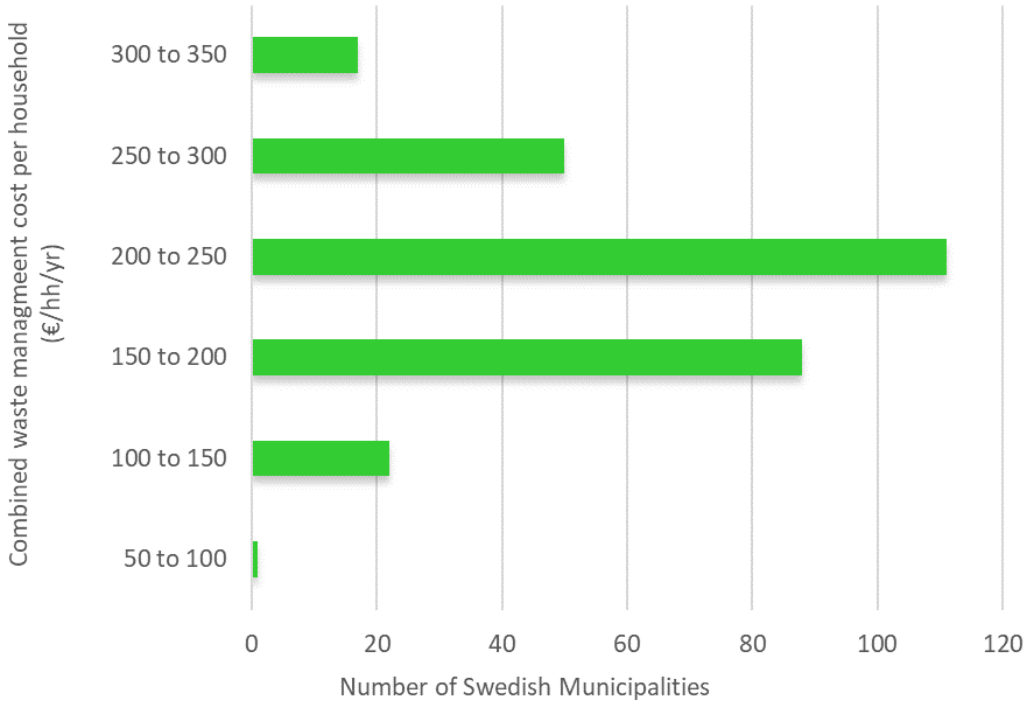
[26] http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfst_hhanwhtc&lang=en

3.6 Sweden

3.6.1 Waste Management Costs

In seeking to establish the waste management costs for Sweden, SLR has initially referred to a report published in 2017 of waste costs by municipalities in Sweden[27]. The report presents the waste management costs across the 290 municipalities in the country, the details of which are summarised in Figure 3-14.

Figure 3-14
Waste Management Costs per Household in Sweden



The report shows that the waste costs per household varied between SEK 950 and 3,390 (Swedish Krona). The average cost per household was approximately SEK 2,100 across the 290 municipalities (~€216/hh)[28].

According to Eurostat, the average household occupancy rate in Sweden during this period was approximately 1.9 people per household, indicating that on a per capita basis, the household waste collection and disposal cost in Sweden amounts to approximately **€114** per person.

In order to benchmark the collection costs with Ireland, we adjust for apartment versus houses in each country. Based on data from Ireland, the cost per capita of collecting from houses is roughly 1.5 times more expensive than the cost of collecting from apartments. According to the Eurostat data quoted earlier in this report, 45.1% of people in Sweden live in flats or apartments compared to 41.8% on average in the EU. Adjusting for this factor, if Sweden had 41.8% of people living in apartments, the adjusted cost per capita would be **€115.48**.

[27] http://www.villaagarna.se/Global/P%C3%A5verka/Avfallsavgifterna-2017-uppdaterad-2018-02-02.pdf

[28] The reported average 2017 exchange rate of SEK 1 to EUR 0.10 is assumed.

3.6.2 Waste Collection Services

It is understood that in Sweden, waste management is the responsibility of municipalities and that households pay a fee that is set per household and paid per building to cover the cost of services delivered. The fee covers the collection, treatment, recovery and disposal of residual waste generated by the household. The waste management strategy in Sweden has relied heavily on extended producer responsibility (EPR)[29], so no fee is paid directly for the collection of dry recyclables from households – this is financed through a packaging fee levied on producers of packaging based on the quantity of material produced. The actual amount payable varies by material type. The costs associated with the collection and processing of recyclable material are in turn passed on to consumers in the price of the products they purchase.

It is reported that there are approximately 5,800 bring points across the country that are provided by producers of waste under their EPR obligations. In addition to these, there are also civic amenity sites that are available for other materials.

The following services are currently offered to facilitate the collection of recyclables:

- comingled collection of recyclables in two 4-compartment bins – one bin for paper, food waste, coloured glass and combustible material (emptied more frequently); and one bin for clear glass, metals, plastic packaging and newspaper (emptied less frequently);
- deposit return system for cans and recyclable PET bottles; and
- glass bottles with a deposit paid are returned to stores and supermarkets.

[29] http://www.green-alliance.org.uk/resources/Creative%20policy%20packages%20for%20waste%20-%20Sweden.pdf

3.7 Italy

3.7.1 Waste Management Costs

According to a survey carried out by Federconsumatori on 'services and rates for waste', waste management costs were approximately €320 for a family of 3 in 2017, (i.e. €106.67 per person)[30].

SLR has sought to corroborate this figure from the Federation with those quoted in other sources. An 'Urban Waste Report' for 2017 published by the Higher Institute for Environmental Protection and Research (ISPRA) has been made available to SLR[31]. The report shows that in 2016, the average annual costs of all waste management activities were approximately €167 per capita. The fee attributed directly to the management of municipal waste is then approximately **€106** per capita, consistent with the above.

In order to benchmark the collection costs with Ireland, we adjust for apartment versus houses in each country. Based on data from Ireland, the cost per capita of collecting from houses is roughly 1.5 times more expensive than the cost of collecting from apartments. According to the Eurostat data quoted earlier in this report, 52.5% of people in Italy live in flats or apartments compared to 41.8% on average in the EU. Adjusting for this factor, if Italy had 41.8% of people living in apartments, the adjusted cost per capita would be **€110.58**.

3.7.2 Waste Collection Services

It is understood that Italy is yet to develop a national waste management plan. The current legislation requires that plans are developed at a local level, so there is some variation in how waste and recyclables are collected across the northern, central and southern regions of the country.

Residual waste (also referred to as restwaste) is typically collected from door to door and in bags, with wheeled bins only used for apartment blocks and complexes with multiple households in the same building. Collections take place once a week in northern Italy and 2 – 3 times a week in central and southern Italy. Frequent collections are typically rolled out in areas where there are no separate food waste collections.

The collection of dry recyclables is partially subsidised by Consonzio Nazionale Imballaggi (CONAI) the national packaging consortium which offers municipalities some financial support based on the quantity and quality of the recyclable materials collected. The materials collected typically include:

- paper and biowaste collected separately via door to door collections;
- comingled collection of plastics and metals via door to door collections;
- separate glass, and comingled plastics and metals at community bring sites; and
- provision of recycling facilities at civic amenity sites.

[30] http://www.helpconsumatori.it/ambiente/rifiuti-federconsumatori-costo-medio-di-320-euro-a-famiglia-ma-con-molte-differenze-territoriali/118206

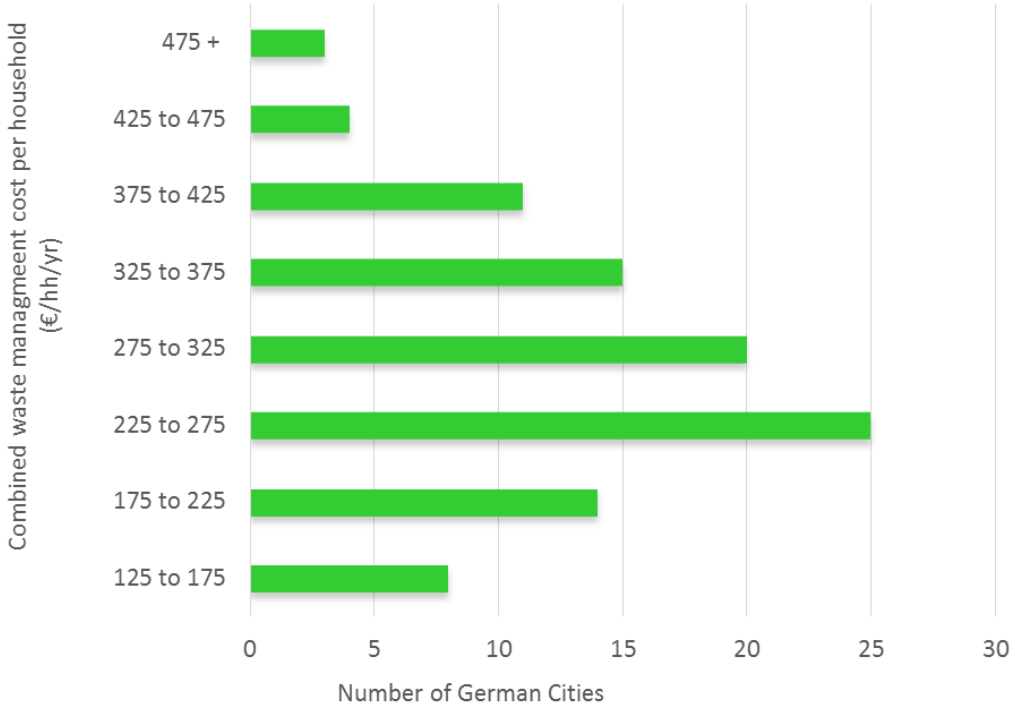
[31] http://www.isprambiente.gov.it/files2017/pubblicazioni/rapporto/RapportoRifiutiUrbani_Ed.2017_n.272_Vers.Integrale_agg08_11_2017.pdf

3.8 Germany

3.8.1 Waste Management Costs

SLR reviewed a 2016 report that compared household waste collection costs in the 100 largest cities in Germany, supplied to the IWMA by the German waste management association (BDE)[32]. The details are summarised in Figure 3-15.

Figure 3-15
Waste Management Costs per Household in Germany



Based on a full service with fortnightly collections, the cheapest city is Flensburg at €135 per household per annum and the most expensive is Leverkusen at €585 per household per annum. The average for all these cities is €295 per household per annum. These figures are exclusive of VAT.

Prices are based on a family of 4, with 2 adults and 2 children, so the average price is **€74** per capita based on the fortnightly service. Note that this is an average of costs for city waste collections. Collection from rural areas is inherently more expensive than city collections, so the data is skewed and the average cost of waste collection in Germany is undoubtedly significantly higher than the figure presented in this report.

In order to benchmark the collection costs with Ireland, we adjust for apartment versus houses in each country. Based on data from Ireland, the cost per capita of collecting from houses is roughly 1.5 times more expensive than the cost of collecting from apartments. According to the Eurostat data quoted earlier in this report, 57.1% of

[32] Report by IW Consult GmbH On behalf of Haus & Grund Germany "Garbage fees in comparison in the 100 largest German cities"

people in Germany live in flats or apartments compared to 41.8% on average in the EU. Adjusting for this factor, if Germany had 41.8% of people living in apartments, the adjusted cost per capita would be **€78.66**.

3.8.2 Waste Collection Services

The German waste management system is solely funded by fees – there are no subsidies. In most instances, the 'polluter pays' principle applies, meaning that waste producers have to pay for the treatment and disposal of the waste they generate[33]. The waste collection services currently on offer include the following:

- a residual waste bin collected fortnightly (limited to 60 litres per week);
- a biowaste bin collected fortnightly (in most cases);
- a weekly waste paper collection (free of charge); and
- bulky waste collections once or twice per annum.

[33] https://ac.els-cdn.com/S1878029616300901/1-s2.0-S1878029616300901-main.pdf?_tid=72de2080-8f1f-403d-a3ee-df24a8d34e3b&acdnat=1524837950_ba29a82a9b76ed452ad2bb676bb994d2

3.9 The Netherlands

3.9.1 Waste Management Costs

In seeking to establish the cost of household waste management in the Netherlands, SLR reviewed a report provided to the IWMA by the Dutch Waste Management Association (DWMA)[34]. The report benchmarked household waste management costs in 154 municipalities in the Netherlands for the year 2014; and suggests a price range between €158 and €189 per household per annum was in place; dependant on the banding in which a property was during that year, with an average of €172 per household (excluding VAT).

The average household occupancy in the Netherlands in 2014 was approximately 2.16 people per household; therefore, the annual cost per capita is estimated to have been **€79.63** per person during this period.

In order to benchmark the collection costs with Ireland, we adjust for apartment versus houses in each country. Based on data from Ireland, the cost per capita of collecting from houses is roughly 1.5 times more expensive than the cost of collecting from apartments. According to the Eurostat data quoted earlier in this report, 18.8% of people in The Netherlands live in flats or apartments compared to 41.8% on average in the EU. Adjusting for this factor, if The Netherlands had 41.8% of people living in apartments, the adjusted cost per capita would be **€73.12**.

3.9.2 Waste Collection Services

The collection system in the Netherlands varies widely. Arisings of residual waste in the Netherlands are currently approximately 222kg per person per annum, however there is a strong emphasis on restricting residual waste with a view to reducing it to below 100kg per person per annum. While collection schemes vary, a collection scheme in the Netherlands typically comprises the following[35]:

- A residual waste bin (green / grey) for non-recyclable waste. In some apartment blocks, waste is deposited in large underground collection vats that are accessed via a locked above-ground chute, with local residents issued with a key for access.
- Households are not issued with a container for the collection of glass. Instead, there are several drop-off points around the local area where glass can be deposited in special containers, with clear glass segregated from coloured glass.
- Households are not issued with a container for the collection of plastic or textiles. Instead, as in the case of glass there are several drop-off points around the local area where plastic and textiles can be placed in designated containers.
- A designated recycling bin for paper and cardboard can be issued to households upon request to the local authority. Alternatively, paper and cardboard can be recycled at any of the local recycling drop-off points.
- A green container is provided for the composting of organic waste (food and garden waste). Garden waste can alternatively be taken to a local collection point for composting by the local authority.

[34] Benchmark Huishoudelijk AfvalPeiljaar 2014

[35] from https://www.angloinfo.com/how-to/netherlands/housing/setting-up-home/recycling

3.10 Austria

3.10.1 Waste Management Costs

The Austrian Waste Management Association provided data from Vienna (2017 data), Salzburg (2018 data) and Graz (2006 data).

The relevant prices, exclusive of VAT are as follows:

- Vienna – weekly collection of residual waste is mandatory in Vienna, price is €431 for a 240L bin including fortnightly collection of the other 2 bins. If a 120L bin is used for residual waste, the fee drops to €215.
- Salzburg – fortnightly collection of each 240L bin, price is €197.
- Graz – fortnightly collection of each 240L bin, price is €308.

Given that the residual waste bin must be collected every week in Vienna, the price for the 120L bin has been used for the estimation of the waste costs as this is most comparable with Ireland. The average of the three municipalities is therefore estimated at €240 per household per annum.

The average household occupancy in Austria is approximately 2.25 people per household; therefore, the annual cost per capita is estimated to have been approximately **€107** per person.

In order to benchmark the collection costs with Ireland, we adjust for apartment versus houses in each country. Based on data from Ireland, the cost per capita of collecting from houses is roughly 1.5 times more expensive than the cost of collecting from apartments. According to the Eurostat data quoted earlier in this report, 45.0% of people in Austria live in flats or apartments compared to 41.8% on average in the EU. Adjusting for this factor, if Austria had 41.8% of people living in apartments, the adjusted cost per capita would be **€108.34**.

3.10.2 Waste Collection Services

There are 9 local authorities collecting household waste in Austria and they decide individually on the local waste collection system. The systems comprise the following:

- Residual waste + biowaste + paper/cardboard collected separately in a 3-bin system,
- Residual waste + paper/cardboard collected separately in a 2-bin-system,
- Residual waste + paper/cardboard + plastic packaging (yellow bag or bin) in a 3-bin system.

In addition to direct household waste collections, there is also an extensive network of community recycling centres and collection points for a wider range of materials including textiles, yard waste, batteries and WEEE amongst other materials.

Lower densely populated regions (e.g. within The Alps) suffer from much higher costs due to lower quantities of recyclables collected and longer transport distances. Densely populated regions like the bigger cities are achieving higher quantities (but less quality) and lower costs.

Total generation of MSW was 4.16 Mio metric tons in whole Austria in 2017. From that total amount 155,000 tons plastic packaging (generated in households) and 935,000 tons of biowaste (also only from households) have been collected separately Austria-wide.

3.11 Finland

3.11.1 Waste Management Costs

The Finnish Waste Management Association (KIVO) prepared a 2017 report[36] addressing the costs of municipal waste management in Finland. The report suggests that the average costs per person for waste collection, including 24% VAT, is as follows:

- Persons living in apartment blocks = €62.02 per annum (€47.14 ex. VAT)
- Persons living in urban flats/apartments (c.8 to 16 flats per building) = €84.21 per annum (€64.00 ex. VAT)
- Persons living in single houses = €81.05 per annum (€61.60 ex. VAT)

The data is derived from questionnaire responses from 89 communities across Finland, so it is quite extensive.

Eurostat data quoted earlier in this report suggests that 34.2% of people living in Finland live in flats/apartments. We take this to mean apartment buildings and urban flats, so we estimate that 34.2% of the population are serviced at an ex. VAT cost of €55.57 per annum[37] and 65.8% of the population are serviced at an ex. VAT cost of €61.60 per annum. The average cost of household waste collection and treatment in Finland is therefore estimated at **€59.54** per capita.

In order to benchmark the collection costs with Ireland, we adjust for apartment versus houses in each country. According to the Eurostat data quoted earlier in this report, 34.2% of people in Finland live in flats or apartments compared to 41.8% on average in the EU. Adjusting for this factor, if Finland had 41.8% of people living in apartments, the adjusted cost per capita would be **€59.08**.

3.11.2 Waste Collection Services

Municipalities are obliged to provide facilities for the separate collection and recycling of paper, cardboard, glass, metal, plastic and biowaste where it is reasonably practicable to do so. Paper, cardboard, glass, metal and biowaste are typically collected via a door-to-door collection, while a deposit refund system is in place for plastic bottles. The deposit refund system is also available for glass bottles, jars and metal cans.

The KIVO report referenced above provides further details on the average frequency of collections as follows:

Apartment Buildings:

Mixed/Residual waste – weekly collection – 600/660 litre bins
Biowaste – weekly collection - 240 litre bins
Paper – 30 times per year – 600/660 litre bins
Cartons – weekly collection – 600/660/1,000 litre bins
Glass – 8 times per year – 240/360 litre bins
Metal (cans) – 8 to 11 times per year – 240 to 660 litre bins
Plastics – weekly collection – 600/660 litre bins

[36] 'Tietoa kotitalouksien jätehuollosta 2017 Jätteiden keräys kotitalouksista ja jätelajien vastaanottohinnat' (Information on household waste management 2017 Waste collection from households and waste collection rates) – KIVO 2017.

[37] Average of the apartment blocks and urban flats.

Urban Flats /Apartments:

Mixed/Residual waste – weekly collection – 600/660 litre bins
Biowaste – weekly collection – 140/240 litre bins
Paper – 18 times per year – 600/660 litre bins
Cartons – 19 times per year – 600/660 litre bins
Glass – 6 times per year – 240 litre bins
Metal (cans) – 7 times per year – 240 litre bins
Energy Waste – monthly collection – 600/660 litre bins

Single Houses:

Mixed/Residual waste – 24 times per year – 240 litre bins
Biowaste – 20 times per year – 240 litre bins[38]

[38] most single houses do not have biowaste collections. In our calculation, we use the cost of collecting from single houses with biowaste collections as this is the norm in RoI.

3.12 France

3.12.1 Waste Management Costs

SLR has reviewed a report on 2014 waste collection costs in France, prepared by ADEME in 2018[39], the summary of which is tabulated in Table 3-1. The table shows the average assisted cost per capita for municipal waste collection in France and the breakdown of that cost.

Table 3-1
Municipal Waste Management Costs in France per Capita

Item	€ / Person
Residual Household Waste	56.00
Dry Recyclable Household Waste	9.00
Glass	1.70
Civic Amenity Sites	20.00
Other	6.30
Total	**93.00**

The data includes the cost of operating the civic amenity sites, so it should be adjusted downward to **€73** to just cover household waste collection costs per capita. However, there appears to be no biowaste collection costs, so it is not directly comparable to Ireland.

In order to benchmark the collection costs with Ireland, we adjust for apartment versus houses in each country. Based on data from Ireland, the cost per capita of collecting from houses is roughly 1.5 times more expensive than the cost of collecting from apartments. According to the Eurostat data quoted earlier in this report, 31.5% of people in France live in flats or apartments compared to 41.8% on average in the EU. Adjusting for this factor, if France had 41.8% of people living in apartments, the adjusted cost per capita would be **€70.20**.

3.12.2 Waste Collection Services

In France, wastes generated by households are typically collected by the municipality. The exact nature of the waste services offered is delegated to the respective municipalities, therefore there is considerable variation in the services offered throughout the country. Assessing the five largest regions in the country, the typical waste services on offer are as follows:

- Residual waste – door to door collections;
- Plastics and metals – door to door comingled collections;
- Paper and glass – bring points and community recycling points; and
- Biowaste – not often collected.

[39] NATIONAL REFERENCE OF COSTS OF THE PUBLIC SERVICE OF WASTE MANAGEMENT, 2017 Edition (2014 data), ADEME - Agence de l'Environnement et de la Maitrise de l'Energie. (French Environment and Energy Agency)

3.13 Belgium

3.13.1 Waste Management Costs

SLR reviewed a 2015 report on waste management in Flanders prepared by Buck Consultants International for the Public Waste Agency of Flanders (OVAM) and provided to the IWMA by the Belgian Waste Management Association[40]. The relevant data has been extracted from the report and is presented in Table 3-2.

Table 3-2
Municipal Waste Collection Costs in Flanders

Item	% of Recyclables	Kg per capita	€ per kg	€ per tonne	€ per capita
Collection Cost					30.00
Residual waste		160.00	0.14	140	22.40
Paper and cardboard	20%	73.40	0	0	0.00
Green waste	19%	69.73	0.04	40	2.79
Construction and demolition waste	19%	69.73	0.085	85	5.93
Biowaste	12%	44.04	0.075	75	3.30
Glass (white and mixed)	8%	29.36	0.06	60	1.76
Wood waste	7%	25.69	0.2	200	5.14
Plastic Bottles, Metal packaging, Drink Cartons (PMD).	3%	11.01	0	0	0.00
WEEE	3%	11.01	0	0	0.00
Metal	3%	11.01	-0.14	-140	-1.54
Textile	2%	7.34	-0.045	-45	-0.33
Bulky Waste	2%	7.34	0.14	140	1.03
Remaining	2%	7.34	0.14	140	1.03
	100%				**71.50**

The data suggests a cost per capita of €71.50 per annum, excluding VAT. Construction and demolition waste does not form part of normal kerbside household collections, so we remove the €5.93 cost quoted above. Similarly, we remove the €5.14 cost associated with wood waste.

However, as with the UK costs, we believe that the costs quoted in the OVAM report do not include shared support services such as such as finance, legal, human resources, information technology, internal audit, procurement and asset management. To be consistent, we add 4% to the costs here to cover those services, giving a cost per capita of **€62.85.**

[40] Socio-economic significance in Implementation Plan for waste materials and materials management 2016-2022, Buck Consultants International, 16th November 2015. Prepared on behalf of OVAM (Public Waste Agency of Flanders).

In order to benchmark the collection costs with Ireland, we adjust for apartment versus houses in each country. Based on data from Ireland, the cost per capita of collecting from houses is roughly 1.5 times more expensive than the cost of collecting from apartments. According to the Eurostat data quoted earlier in this report, 21.9% of people in Belgium live in flats or apartments compared to 41.8% on average in the EU. Adjusting for this factor, if Belgium had 41.8% of people living in apartments, the adjusted cost per capita would be **€58.35**.

3.13.2 Waste Collection Services

Waste collection requirements across Belgium vary between the three administrative regions of Brussels, Flanders and Wallonia. In as far as the separate collection of materials is concerned, the following guidelines apply:

- Brussels – the separate collection of paper, cardboard, metal, plastic, glass and organic waste is mandatory. Plastics and metals are often comingled.
- Flanders – the separate collection of paper, cardboard, metal packaging, plastic, glass, drinks cartons and organic waste is mandatory. Plastics and metals are often comingled. Furthermore, wood and metals must be separated and where it is not possible to do so, must be sorted and separated out following collection.
- Wallonia – the separate collection of paper, cardboard, metal, plastic and glass is mandatory. Plastics and metals are often comingled. There are also specific provisions within the guidance for reuse of materials. Notably, the collection of biowaste is not mandatory although is implemented in approximately a quarter of all municipalities in the region.

Belgian waste management policy is guided by the polluter pays principle and takes the form of:

- variable charging for the disposal of waste by households based on volume or weight;
- recycling fees paid when purchasing products (e.g. vehicle tyres or electric / electronic devices); and
- extended producer responsibility whereby manufacturers are obliged to have provisions in place to manage the goods they produce and sell once they have reached the end of their working lives.

4.0 Conclusions on Benchmarking Against Other Countries

Taking the estimated costs of household waste collection and treatment in each of the benchmarked countries, the lowest to highest costs are listed in Table 4-1 below, with some relevant comments.

Table 4-1 Household Waste Collection Costs per Capita in Each Country

Rank	Country	Cost per capita	Comments
1	Finland	€ 59.54	No recyclables collected from single houses. Low rural population.
2	Belgium (Flanders)	€ 62.85	Flanders only. High population density & very low rural population.
3	France	€ 73.00	Biowaste not commonly collected at kerbside.
4	England	€ 73.75	Relatively low labour costs. High Population density. Low rural population.
5	Germany	€ 74.00	Costs are for 100 largest cities, so urban in nature.
6	Wales	€ 76.80	Relatively low labour costs.
7	Netherlands	€ 79.63	High Population density. Low rural population
8	Republic of Ireland	€ 81.50	Low population density. High rural population.
9	Scotland	€ 84.63	Low population density.
10	Northern Ireland	€ 101.84	Low population density. High rural population.
11	Italy	€ 106.00	High rural population.
12	Austria	€ 107.00	High rural population.
13	Sweden	€ 114.00	Low population density & relatively high labour costs
14	Denmark	€ 134.00	High labour costs. Relatively low population density
	Average	**€ 87.75**	

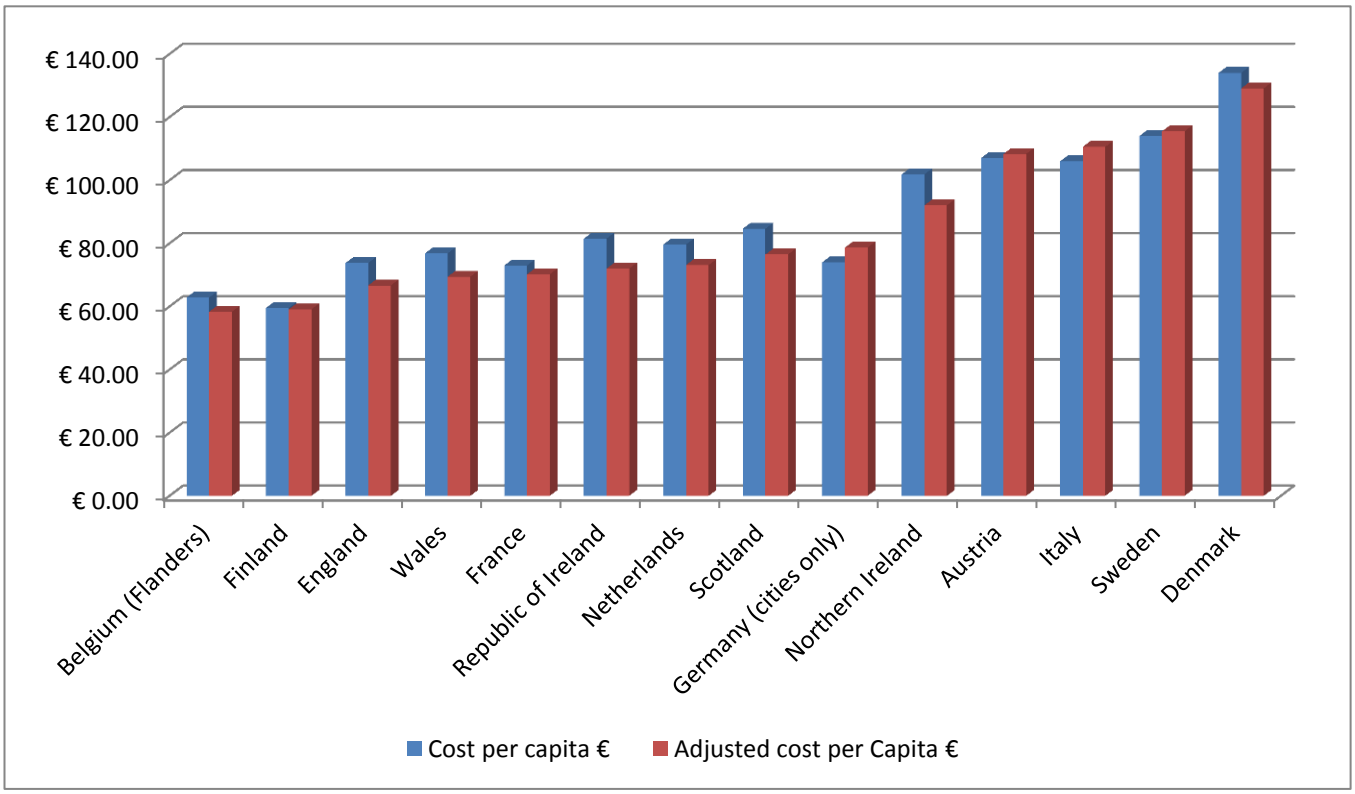
Incorporating the adjustment for apartments versus houses, as detailed in each Chapter of this report, the ranking is adjusted in Table 4-2.

Table 4-2 Household Waste Collection Costs Per Capita Adjusted to Account for Apartments

Rank	Country	Adjusted Cost per Capita €
1	Belgium (Flanders)	€ 58.35
2	Finland	€ 59.08
3	England	€ 66.65
4	Wales	€ 69.41
5	France	€ 70.20
6	Republic of Ireland	€ 72.00
7	Netherlands	€ 73.12
8	Scotland	€ 76.48
9	Germany (cities only)	€ 78.66
10	Northern Ireland	€ 92.04
11	Austria	€ 108.34
12	Italy	€ 110.58
13	Sweden	€ 115.48
14	Denmark	€ 129.09
	Average	**€ 84.25**

The data included in Tables 4-1 and 4-2 is presented graphically on Figure 4-1 below.

Figure 4-1
Household Waste Collection Costs Per Capita in Shortlisted Countries



The data shows that the prices charged for kerbside household waste collection in the Republic of Ireland are below average when compared with other countries in Europe that fall within the same brackets for waste management performance and labour costs.

Table 4-3 below provides more detail on some of the factors that influence the costs of household waste collection.

Table 4-3 Household Waste Collection Cost Factors in Each Country

Rank	Country	Adjusted cost per Capita	Average Labour Costs € per hour	Population Density (people per km2)	Rural Population	Recycling Rate	Landfill Reliance
1	Belgium (Flanders)	€ 58.35	€ 39.60	480	2%	54%	0.8%
2	Finland	€ 59.08	€ 32.70	18	16%	42%	3.3%
3	England	€ 66.65	€ 25.70	420	17%	45%	15.6%
4	Wales	€ 69.41	€ 25.70	149	20%	61%	9.6%
5	France	€ 70.20	€ 36.00	106	20%	42%	22.4%
6	Republic of Ireland	€ 72.00	€ 31.00	69	36%	42%	21.7%
7	Netherlands	€ 73.12	€ 34.80	498	9%	53%	1.4%
8	Scotland	€ 76.48	€ 25.70	67	18%	43%	45.3%

Rank	Country	Adjusted cost per Capita	Average Labour Costs € per hour	Population Density (people per km2)	Rural Population	Recycling Rate	Landfill Reliance
9	Germany	€ 78.66	€ 34.10	233	24%	66%	1.5%
10	Northern Ireland	€ 92.04	€ 25.70	136	37%	43%	37.0%
11	Austria	€ 108.34	€ 34.10	106	34%	59%	2.7%
12	Italy	€ 110.58	€ 28.20	204	31%	51%	27.6%
13	Sweden	€ 115.48	€ 38.30	24	14%	49%	0.6%
14	Denmark	€ 129.09	€ 42.50	136	12%	48%	1.0%

It can be seen from Table 4-3 that some of the more expensive countries such as Sweden, Denmark and Austria are achieving very low landfill levels and very high recycling rates. Austria, Italy and Northern Ireland have a relatively high proportion of their population living in rural areas and this clearly adds cost.

Belgium (Flanders) and England have very high population densities, which may explain the low costs in those countries. Finland is low cost for a country with a very low population density, but the demographics are helped by the fact that only 16% of the population live in rural areas. This is even more of an advantage in Belgium, where the World Bank data reports that only 2% of people live in rural areas.

The Republic of Ireland is performing well on price, but lags behind many of the benchmarked countries in terms of recycling rates. We expect that the continued roll-out of brown (organic) bins will increase Ireland's recycling rate without having a significant impact on the prices charged to householders. We expect that the recycling rate can reach 50% through this ongoing programme, which is the average of the benchmarked countries.

The biggest factors for prices in Ireland are thought to be the high rural population and the low population density. The prices in Ireland are significantly lower than in other countries that have a high percentage of the population living in rural areas, such as Northern Ireland, Austria and Italy, so the price performance in Ireland is considered to be very good in light of the demographics.

5.0 Historical Waste Collection Costs in Ireland

5.1 Background and Brief

As part of our brief, SLR was also asked to benchmark current prices for kerbside household waste collection and treatment against historical costs/charges, at a time when the local authorities were heavily involved in the collection and management of kerbside household waste in the Republic of Ireland. For this exercise, we have selected 2004 as the reference year for the following reasons:

- The Competition Authority reviewed the prices offered by private waste management companies across Ireland that year, as part of an investigation into prices charged by Greenstar in North Wicklow, so there is some good available data for that year.
- The local authorities prepared regional waste management plans in 2005 that contained relevant data for 2004/2005.
- By 2006, the local authorities started to withdraw from the market and our brief involved assessment of local authority costs and prices, so it was important to select a year prior to 2006.

Where 2004 data was not available, we use 2005 data.

5.2 Municipal Waste Management in Ireland in 2004

The EPA National Waste Report (NWR) for 2004 provides data on waste management in Ireland in that year. Key points for municipal waste are as follows:

- Recycling Rate for municipal waste was 32.6%
- Recovery Rate for municipal waste was 33.6% (recycling plus small quantity of energy recovery at incinerators in Germany)
- Landfill disposal rate for municipal waste was 66.4%
- Recovery rate for household waste was 19.5%
- Landfill disposal rate for household waste was 80.5%

By 2004, most householders were provided with a separate collection for dry recyclables, in addition to residual waste collections. The EPA NWR stated that twelve local authorities reported the collection of 20,078 tonnes of organic waste from households via kerbside schemes in 2004. The report stated that *"Separate kerbside collection of organic waste is a growing but not well-established."*

There were 34 active landfills across the country in 2004 and they accepted 1,818,535 tonnes of municipal waste for disposal. Only two of these landfills were privately owned[41], the rest were operated by the local authorities. The landfill levy was first introduced to Ireland in 2002 at a rate of €15 per tonne and was still at that rate in 2004. The levy is currently €75 per tonne.

Despite the low level of the landfill levy in 2004, landfill prices were very high in Ireland. The standard of landfill design and operation was improving significantly at that time at high cost and many landfills were quite small, so economies of scale were poor in many, but not all, cases.

[41] KTK in Kildare (248,049 t – commercial & industrial waste only) and Knockharley in Meath (910 t) which opened at the end of that year.

It is evident from budget data provided to SLR, that some local authorities were not charging the full cost of waste collection and treatment to their household customers and were using landfill tipping fees charged to private sector collectors to balance their books.

Table 5-1 below presents data on the tonnages of household waste accepted at landfills in 2004 and the charges offered to the private sector at that time. The tonnages are derived from the EPA National waste Report and the prices quoted are from a survey carried out by White Young Green at the time.[42]

Table 5-1 Landfill Charges in Ireland in 2004

Facility	Operator	Household Waste Landfilled in 2004	Estimated Price 2004
Greater Dublin Area			
Arthurstown (Kill), Co. Kildare	Dublin City Council	424,067	€100
Balleally, Co. Fingal	Fingal Co. Co.	69,915	€100
Rampere, Co. Wicklow	Wicklow Co. Co.	11,451	€201
Ballyogan, Dun Laoghaire	DLR Co. Co.	65,407	€100
Knockharley, Co. Meath	Greenstar	910	€115
South West/Mid West			
North Kerry	Kerry Co. Co.	32,581	€170
Gortadroma, Limerick	Limerick Co. Co.	25,600	€155
Inagh, Ennis	Clare Co. Co.	28,964	€160
Connaught			
Pollboy, Ballinasloe	Galway Co. Co.	48,366	€137
Derrinumera, Castlebar	Mayo, Co. Co.	23,969	€150
Rathroeen, Ballina	Mayo, Co. Co.	20,845	€150
Ballaghaderreen, Roscommon	Roscommon Co. Co.	23,153	€140
Cork			
Kinsale Road, Cork City	Cork City Council	48,280	€100
East Cork	Cork Co. Co.	47,634	€100
Youghal, Cork	Cork Co. Co.	3,721	€240
Benduff, Cork	Cork Co. Co.	890	€240
Derryconnell, Cork	Cork Co. Co.	6,993	€240
Midlands			
Kyletelesha, Portlaoise	Laois Co. Co.	27,916	€135
Ballydonagh, Athlone	Westmeath Co. Co.	21,712	€150
Ballaghaveny, Nenagh	North Tipp Co. Co.	23,057	€149
Derryclure, Tullamore	Offaly Co. Co.	23,423	€135

[42] White Young Green carried out regular surveys of landfill charges during this period and published these in their quarterly newsletter 'wastelines'.

Facility	Operator	Household Waste Landfilled in 2004	Estimated Price 2004
North East			
Whiteriver, Ardee	Louth Co. Co.	32,087	€145
Corranure, Cavan	Cavan Co. Co.	48,727	€125
Scotch Corner, Monaghan Town	Monaghan Co. Co.	35,307	€145
South East			
Donohill, Tipperary Town	South Tipp Co. Co.	13,825	€165
Kilbarry, Waterford City	Waterford City Co.	9,404	€150
Dungarvan, West Waterford	Waterford Co. Co.	240	€150
Tramore, South Waterford	Waterford Co. Co.	15,529	€150
Powerstown, Carlow	Carlow Co. Co.	19,857	€156
Dunmore, Kilkenny	Kilkenny Co. Co.	11,025	€126
Killurin, Enniscorthy	Wexford Co. Co.	25,534	€180
Donegal			
Balbane	Donegal Co. Co.	187	€125
Ballynacarrick, Donegal	Donegal Co. Co.	24,333	€125
Total Household Waste Disposed		**1,214,909**	

5.3 Private Sector Charges in 2004

The Competition Authority (CA) analysed the price of kerbside household waste collection in Ireland in 2004 in a report[43] that was prepared in a response to a complaint about Greenstar in Northeast Wicklow. The CA report concluded that there was no abuse of a dominant position by Greenstar. The CA surveyed private waste collectors in each County in the State to assist with their investigation. Table 5-2 below presents the results of the CA survey of charges as quoted in the report.

Table 5-2 Private Operator Charges for Household Waste Collection Services 2004

County	Annual Price (€) 240 l bins
Carlow	420-444
Cavan	324
Clare	330
Cork	360-370
Donegal	360
Galway	350-375

[43] Enforcement Decision Series (No. E/05/002), Decision of the Competition Authority (Case COM/108/02), Alleged excessive pricing by Greenstar Recycling Holdings Limited in the provision of household waste collection services in northeast Wicklow. Published on 30th August 2005, but price data was from 2004.

County	Annual Price (€) 240 l bins
Kildare	320-360
Kilkenny	456-480
Laois	320-384
Leitrim	380
Limerick	344
Longford	324-380
Louth	270-372
Mayo	300-360
Meath	270-372
Monaghan	324-372
Offaly	312-324
Tipperary	380-384
Roscommon	350
Sligo	350
Waterford	480
Wexford	420-460
Wicklow	372

The private operator charges in 2004 were high compared to today. The current price in urban areas in Ireland is generally between €200 and €300 per annum and the price in rural areas is generally between €300 and €400 per annum, with some exceptions to both cases.

We suggest that the main reasons for such high charges by private sector companies in 2004 are as follows:

- The majority (c.80%) of household waste collected in 2004 was disposed to landfill and local authority landfill charges were very high at the time for the reasons mentioned earlier in this Chapter.
- In 2004, the private sector was dominant in rural areas where many local authorities had withdrawn from service provision and the local authorities were dominant in the main urban centres (Dublin, Cork, Waterford & Galway) where the economies of scale and density are much greater.

5.4 Public Sector Costs & Charges in 2004

Approximately 15(No.) local authorities collected household waste in 2004. Some collections were carried out by town councils and urban district councils on behalf of the County Councils.

In order to estimate the cost of waste collection and treatment for the local authorities, we analysed budgets and we reviewed the relevant regional waste management plans that were published in 2005, containing 2004 data.

Our findings are detailed in the following sections. We were unable to get good reliable data from all local authorities that collected household waste at the time, but our analysis represents a good geographical spread and included both urban and rural areas.

5.4.1 Dublin Region

The four local authorities in Dublin City and County[44] collected household waste in 2004 with little or no private sector competition. The residual waste from Fingal was delivered to Balleally Landfill, whereas the residual waste from the other 3 authorities was delivered to Arthurstown Landfill in Kill, County Kildare, which was operated by South Dublin County Council.

The four authorities agreed contracts with two private companies[45] to collect mixed dry recyclables monthly in 240 litre bins from all households in Dublin City and County. The materials collected were paper, cardboard, steel cans and aluminium cans initially. Plastic bottles were added at a later date.

A modest number of brown (organic) bins were rolled out on a pilot scale in some areas of Dublin at that time.

The 2005 to 2010 Regional Waste Management Plan for the Dublin Region recognised that the local authorities were not charging the full costs of the household waste collection service. The report analysed the actual costs of collection, transport, bulking and treatment of kerbside household waste and concluded that the costs for the 4 Dublin Authorities was €114.9m in 2004[46]. The authorities serviced approximately 376,000 houses that year, so we estimate that the service cost was €306 per household in that year.

If VAT was applied at 13.5%, which was the rate then for private waste collectors and remains the rate now for waste collection services, the cost to the customer would be **€347** per annum. This is the relevant figure for benchmarking with current prices and private sector prices at the time.

SLR analysed the four Dublin local authority budgets to estimate the cost per household in each local authority. Our analysis found that the local authorities operating the two landfills, Fingal and South Dublin, had lower costs than the other two authorities.

In our analysis we used the following costs from the Council budgets:

- Tipheads (operation and disposal costs)
- Domestic Refuse Collection Costs
- Waste Management Administration and Claims (we used 50% of this figure)

We also included the following income in our calculations:

- Income from Pooled and 3rd Party Tipping Fees
- Income from Recycling Facilities

The results were as follows (including VAT at 13.5% for benchmarking purposes):

- Dublin City **€368**
- Fingal Co Co **€299**
- South Dublin Co Co **€348**
- Dun Laoghaire Rathdown Co Co **€395** (2005 data – 2004 was not available from DLR CC)

[44] Dublin City Council, South Dublin County Council, Fingal County Council & Dun Laoghaire-Rathdown County Council.

[45] Oxigen Environmental and Bailey Waste Paper

[46] See Table 13.2, page 97 of the Plan.

5.4.2 Galway City Council

The 2005 to 2010 Connaught Regional Waste Management Plan provided information on waste collection charges in 2004.[47] It stated that Galway City Council provided a 3-bin system and charged a flat fee of €354 per household per annum for that service. Adding VAT at 13.5% for benchmarking purposes that equates to **€402** per household per annum.

5.4.3 Kerry County Council

In response to a Freedom of Information request, Kerry County Council provided details of refuse collection charges applied in 2005 and estimates of the annual charge per household, based on usage levels. The annual charge for a household that practiced home composting was estimated at €341 per annum and a household that did not home compost was estimated at €395 per annum. Adding VAT at 13.5% for benchmarking purposes this gives us a range of **€387** to **€448** per annum.

5.4.4 Waterford City Council

Relevant details from the 2005 Budget for Waterford City Council were provided to SLR in response to a Freedom of Information Request. The data shows that Council spent €3.5m on waste collection and treatment, including the cost of waivers and the operation of the landfill site at Kilbarry, but excluding the operation of CA sites. Landfill and composting income came to approximately €100K, so net expenditure on household waste collection and treatment was approximately €3.4 million.

The budget data states that the Council served 16,000 households in the City at the time, so the cost per household is estimated at €213 per household, which works out at **€242** per household per annum, when VAT at 13.5% is added for benchmarking purposes.

The Budget noted that Kilbarry Landfill was closing at the time and an additional €1.4 million per annum would have to be spent in transferring to a different landfill in subsequent years. That equates to an extra €99 extra per household per annum, when VAT is included, giving a 2005 cost of **€341.**

5.4.5 Waterford County Council

Relevant details from the 2005 Budget for Waterford County Council were provided to SLR in response to a Freedom of Information Request. According to the 2005 to 2010 Joint Waste Management Plan for the Southeast Region,[48] approximately 70% of the households in County Waterford were serviced by the County Council at that time. We estimate from historical CSO data that this was approximately 13,000 houses.[49]

The 2005 Budget figures includes the proposed domestic refuse charges for that year, based on full cost recovery, as follows:

- Residual Waste €13 per collection (bin)
- Organic Waste €7.50 per collection (bin)
- Dr Recyclable Waste €2.50 per plastic sack

On average, households in Ireland deliver just over 1 tonne of waste per annum to kerbside collections. If this was all delivered to residual bins, it would require 26 x 40kg lifts and would cost €338 per annum in County

[47] See Table 6.6

[48] See Section 6.1.5

[49] CSO data accounts for 18,606 houses in Waterford County in 2002 (excluding Waterford City).

Waterford, based on the charging system quoted above. When VAT is added for benchmarking purposes, this works out at **€384** per household.

If a household diverted 240kg of organic waste in 6 x 40kg lifts and diverted 240kg of dry recyclables in 60 x 4kg sacks, that would reduce the residual waste lifts to 14 x 40kg. The cost would be **€448** per annum.

5.4.6 South Tipperary County Council

Relevant details from the 2005 Budget for South Tipperary County Council were provided to SLR in response to a Freedom of Information Request. The data shows a 2005 budget figure of €3,635,086 relating to household waste collection and treatment.

According to the 2005 to 2010 Joint Waste Management Plan for the Southeast Region,[50] approximately 15,000 households in South Tipperary were serviced by the County Council at that time. It states:

"South Tipperary County Council, Clonmel, Carrick-on-Suir, Tipperary and Cashel Urban District Councils are all involved in household waste collection and service approximately 15,000 or 57% of householders."

It appears that the South Tipperary County Council Budget figures do not include costs incurred by the Urban District Councils in collecting waste, so we believe that the data is incomplete.

However, SLR found relevant data in a report[51] prepared by Trinity College Dublin (TCD) for the EPA in 2005. Appendix A23 of that report, in addressing South Tipperary County Council charges, includes the following text:

"Prior to the introduction of PBU charges, householders in the local authority's functional area paid a flat rate of €300 per annum."

The report states that Pay By Use (PBU) charges were introduced in 2004, so the quoted flat rate relates to that year. On that basis and adding 13.5% VAT for benchmarking purposes, the relevant figure for South Tipperary County Council is **€341** per household per annum.

5.4.7 Wexford County Council

SLR informally requested the relevant 2004/2005 budget data from Wexford County Council Finance Department, but received no response. However, we found relevant data in the TCD report quoted above. Appendix A26 of that report, in addressing Wexford County Council charges, includes the following text:

"The County Council charges an annual fee of €260.30 for an 80-l bin, €369.20 for a 140-l bin and €516 for a 240-l bin, with a €25 discount to households if the bill is paid in full by a set date. New Ross Town Council charges an annual fee of €80 for an 80-l bin, €215 for a 140-l bin and €370 for a 240-l bin. These charges were selected based on estimates prepared by the Council to include the full cost of the collection, transport, disposal and levies, plus dry recycling."

In our benchmarking comparisons, we use the 240 litre bin prices as this is the standard bin size across Ireland. If we apply the €25 discount and add 13.5% VAT for benchmarking purposes, we get a range of **€420** (New Ross) to **€557** (Wexford CC).

[50] See Section 6.1.3

[51] A Nationwide Review of Pay-By-Use (PBU) Domestic Waste Collection Charges in Ireland: Extensive Survey Findings (2005-WRM-MS-33) Interim Report Prepared for the Environmental Protection Agency by Department of Geography, School of Natural Sciences, Trinity College, Dublin Authors: Abigail O'Callaghan-Platt and Anna Davies (Environmental RTDI Programme 2000–2006)

5.4.8 Summary of Public Sector Costs and Charges in 2004

Table 5-3 summarises the local authority costs and/or charges associated with the collection and treatment of kerbside household waste in 2004.

Table 5-3 Local Authority Costs for Household Waste Collection Services 2004 with VAT[52]

Rank	Local Authority	2004 Cost per Household	2005 Cost per Household (where relevant)	Comments
1	Waterford City	€ 242	€ 341	Operated Kilbarry Landfill but closed in 2004, so Costs increased for 2005
2	Fingal County	€ 299		Operated Balleally Landfill
3	South Tipperary County	€ 341		Operated Donohill Landfill
4	South Dublin County	€ 348		Operated Arthurstown Landfill
5	Dublin City	€ 368		No Operational Landfill
6	Dun Laoghaire Rathdown		€ 395	No Operational Landfill
7	Galway City	€ 402		Provided 3 bin system & Operated Carrowbrowne Landfill & Compost Facility
8	Waterford County	€ 384 to €448		Cost based on 2 scenarios of using residual bin only (lower) or recycling & composting (higher)
9	Kerry County		€ 387 to €448	Operated North Kerry Landfill. Costs are estimated by KCC as system was PBU. Lower cost required home composting
10	Wexford County		€420 to €557	Operated Killurin Landfill. Lower cost is New Ross

5.5 Conclusions on Historical Waste Collection Costs in Ireland

The prices and costs presented in this report for both private sector and local authority kerbside household waste collections are consistent with data presented in the 2005 TCD report for the EPA. Table 3.5 of that report summarised the minimum, maximum and mean costs that the TCD researchers found at the time and that data is presented in Table 5-4 below.

Table 5-4 Charges under a Flat-Rate Waste Collection System Quoted in TCD 2005 Study

Local Authority	Annual Charge (€)
Minimum Charge per Annum	€ 300
Maximum Charge per Annum	€ 520
Mean Charge per Annum	€ 374.81

These figures are a combination of private sector charges, where VAT was included and local authority charges, where VAT was not applied.

[52] Costs/charges have had 13.5% VAT added to allow benchmarking against private sector charges in 2004 and current charges.

It is clear from the data presented above that the costs and charges for kerbside household waste collection in Ireland in 2004/2005 were roughly €100 per household more expensive than current prices.

Since 2004, base costs for waste collection have increased significantly and we provide some examples here:

- The roll-out of a third bin and associated extra collection service to about 60% of households
- Increases in the landfill levy from €15 per tonne in 2004 to €75 per tonne currently (500% increase)
- Increases in wages – minimum wage was €7.00 per hour in 2004 and is currently €9.55 per hour (36.4% increase)
- Increases in insurance costs (well documented large increases, particularly in the waste sector)
- Increases in Diesel Costs from 88 cent per litre in 2004 to €1.28 per litre currently (45% increase)
- Compliance with new regulations that require higher standards, including the installation of RFID chips in all bins, weighing equipment on all collection vehicles and associated back-office systems.

The fact that household waste collection charges are now significantly lower than 2004 is, in our view, due to the following factors:

- Greater efficiencies in waste collection and treatment, including consolidation and vertical integration.
- Landfill charges with the €75 levy are lower than many of the 2004 local authority landfill charges that were artificially high.
- Lower volumes of residual waste are sent to landfill, c.20% now compared with 80% in 2004.
- The development of new infrastructure by the private sector including improved waste transfer stations, waste to energy plants, materials recovery facilities, composting plants and anaerobic digestion plants.
- Better research and engagement with International recycling markets, although this has suffered recently with the restrictions imposed by the Chinese Government.
- Engagement with the European Waste to Energy market as an alternative outlet to landfill, which has effectively capped landfill prices.
- The production of Solid Recovered Fuel (SRF) as an alternative outlet for residual waste. SRF replaces carbon fuels such as coal and pet-coke at cement kilns in Ireland.

6.0 Closure

This report has been prepared by SLR Consulting (Ireland) with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

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