ACR+ European Observatory of Municipal Waste Recycling Performances

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Municipal waste data comparison

This document is prepared by the Association of Cities and Regions for Recycling and sustainable Resource management (ACR+) with the kind contribution of ACR+ members.

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1. Introduction / Background to the project

There is a growing interest across Europe to better understand the data management of municipal waste that does not only prove valuable for internal monitoring purposes, and to measure performance, but also acts as a benchmark allowing comparison of regions and cities of similar typologies but in different Member States.

Despite the availability of waste data that is regularly published at an international level, particularly by the European Environment Agency, Eurostat or OECD and other relevant environmental agencies, there are significant limitations identified on this type of data presentation; the heterogeneity of raw waste data, the variability in terminology to define municipal waste; the lack of detailed municipal waste data on a regional and local level; the variability depending on the data source; the lack of information provided at an operational level, and lastly, the lack of financial control.

ACR+, which for 18 years has acted as a platform for exchange between local and regional authorities in Europe to improve policies for municipal waste management, has agreed to develop a permanent Observatory of municipal waste performances in Europe.

Overall, the Observatory acts as a platform for sharing experiences amongst its members which will allow:

- To elaborate a common methodology for data collection
- To agree on common definitions and shared indicators
- To compare data, performances and practices with a view of improving the local performance and service
- To feed the debate regarding the review of European policy targets[1] foreseen by the EU in 2014

[1] By 2020: 50% recycling and preparing for reuse for municipal paper, metal, plastic and glass waste; 70% recycling and preparing for reuse for construction and demolition waste (Directive 2008/98/EC)

Background

In 2006, ACR+ carried out a study on the 'Image of some of the best performing cities and regions in Europe'[2]. The study aimed to provide a virtual 'optimal' scenario for waste prevention and selective collection which could be selected a best practice at a regional or local level in Europe. At local level, the analysis showed that the best performing European region cities and towns already selectively collect 50 to 80% of municipal waste.

In 2009 ACR+ released the « Municipal Waste in Europe[3]» publication whereby key waste management issues that European municipalities are facing, were addressed. The following graph provides an indication of the amount of waste recycled in capital cities across Europe.

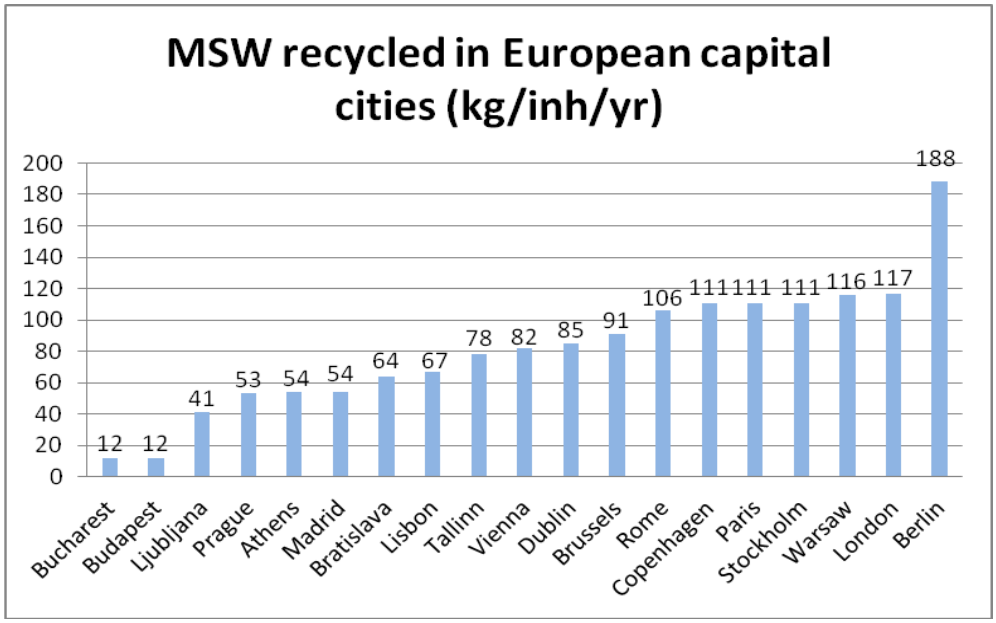


Figure 1: ACR+ – Waste recycling in European Capital cities (2009)

[2] ACR+ publication : Analysis of Municipal Waste Management practices in Europe: 'Image of some of the best performing cities and regions in Europe' (2006)
[3] ACR+ publication: Municipal Waste in Europe: Towards a Recycling Society (2009)

2. How can we better understand and interpret collection and recycling performances?

2.1 Variance across time and amongst regions

Municipal waste constitutes only around 10% of the total waste generated in Europe. However, the political emphasis on municipal waste is very high because of its complex character due to its composition, its distribution among many waste generators and its link to consumption patterns, as well as visibility to the population. On a European level, the development of municipal waste generation and treatment from 1995 to 2009 has changed dramatically. The general trend[4] shows evidence of ''relative decoupling,'' i.e. gradually breaking the link between the production of material wealth and the production of waste.

Municipal Solid Waste (MSW) generation in EU27 increased from 1995 till 2002 with more or less 12%. As from 2002 waste generation fluctuated slightly but remained at the same level of 2002. As from 2007 the waste generation decreased slowly.

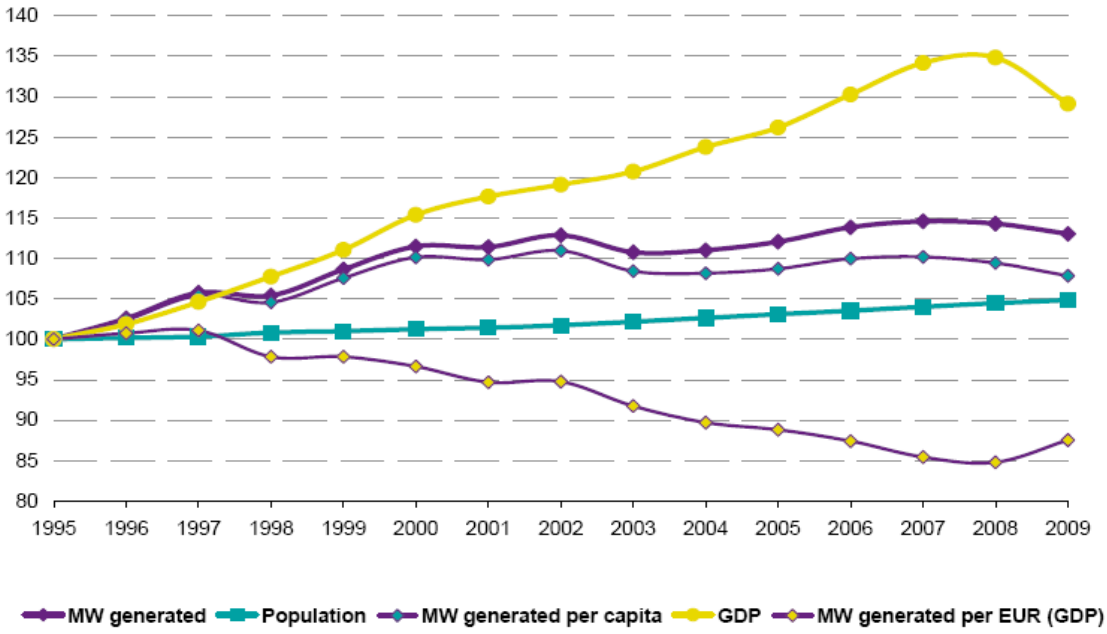


Figure 2: Eurostat – Municipal waste generated, population and GDP in the EU-27 from 1995 to 2009 (1995 = 100)

[4] http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-11-031/EN/KS-SF-11-031-EN.PDF

2.2 Targets are not results

Evidently, targets are not results and therefore by assessing the latest collection, recycling and recovery targets set by the European Commission, we know there is still room for improvement.

		min recovery (1)	**min recycling** (1)	**collection rate (1)**	**Recycling performances (2)**
Packaging directive **1994/62/EC**	2008	60%	55%		57% (2010)
Electronics **2012/19/EC**	2016	70% (2012-2015), 75% (from 2015)	50% (2012-2015), 55% (from 2015)	min 4 kg per inhabitant per year by 2015, 45% by 2016, 85% by 2019	
Biodegradable waste diverted from landfills **1999/31/EC**	2006	reduction to 75% of the 1995 level of biodegradable waste sent to landfills			
	2009	reduction to 50% of the 1995 level			
	2016	reduction to 35% of the 1995 level			
New targets (WFD) **2008/98/EC**	2015	Separate collection: at least paper/metal/plastic/glass			
	2020	50% household waste and other assimilated waste			38% (2011)
	2020	70% construction and demolition waste			65% (2006)

(1) Targets are to be reached per Member State

(2) (2) European average from Eurostat data

Table1: EU recovery, recycling, collection rate and recycling performances for selected waste flows

2.3 Recycling Definition to be clear and transparent

It is interesting to point out that the EC has provided to all EU 27 Member States 4 different options to calculate the '50% target' of MSW by 2020 as foreseen in the Waste Framework Directive

2008/98/EC [5]. Following the comitology process at EU level, it has been decided that flexibility in the way to calculate this has been provided.

The following figure[6] demonstrates the 4 options:

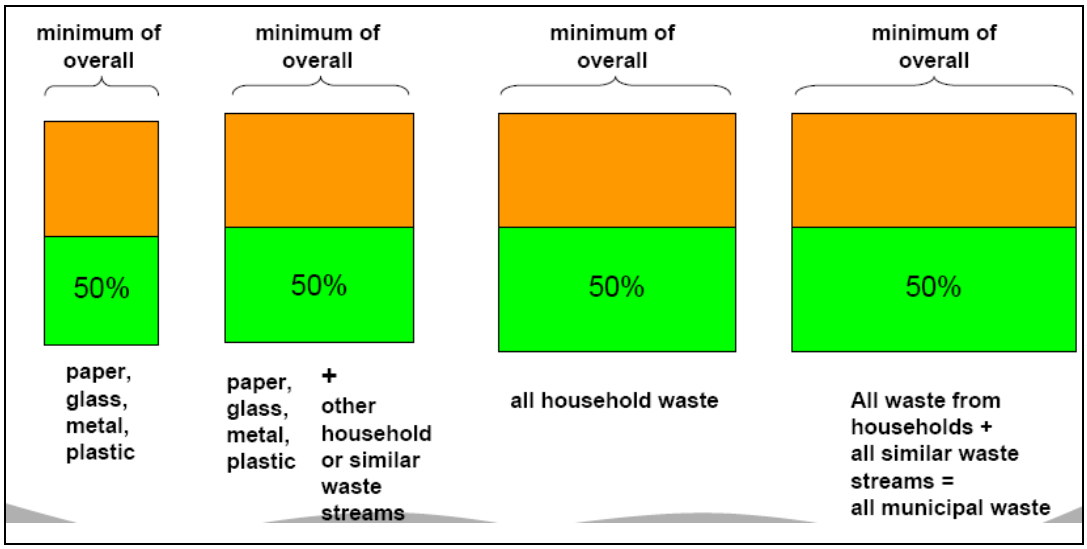


Figure 3: Options to calculate the 50% recycling target of household and other assimilated waste

However, this can raise questions to the individual MS and respectively to the regional and local authorities when calculating the overall recycling rate of their MSW. Also it's important for benchmarking purposes to allow comparison of the same factors and waste streams.

3. Why do we need benchmarking at the regional and local level?

It's important to examine regional or local data as it can provide very meaningful information about the selective collection methodologies and recycling schemes, the frequency of collections as well as the obstacles to improve recycling performances even the communication methods used to increase performance. In addition treatment of recyclables will differ greatly from one region to the other therefore assessment of the treatment destinations from a regional/local level can be very detailed. Following a series of studies, it is apparent that international and national statistics:

- are not greatly harmonised
- do not provide a good basis for benchmarking

[5] "by 2020, the preparing for re-use and the recycling of waste materials such as at least paper, metal, plastic and glass from households and possibly from other origins as far as these waste streams are similar to waste from households, shall be increased to a minimum of overall 50 % by weight" (article 11)
[6] EC presentation

- are not detailed enough to optimise waste management

Therefore we need to develop clear and more accurate calculation methods and work closer with regional and local authorities as they:

- stand closer to the reality of waste management operations and services
- could have easier access to waste and recycling figures
- are in a better position for benchmarking and best practices

4. Scope, objectives & methodology

The **scope** of the Observatory is to create a more transparent & effective collection of waste and recycling data via:

- a pioneer group of regional and local authorities of comparable categories (typology of cities/regions)
- simple shared objectives of quantitative benchmarking

Whereas the agreed **Objectives** are:

- To allow some true comparative analysis of waste management performances
- To clarify some statistical methodological approach
- To find smart solutions for optimisation of waste collection and recycling systems

The increased interest from the ACR+ members as well as the critical time to develop an Observatory within ACR+ was the starting point to this project. The usual project steps were taken in order to implement this initiative: call for interest, working group meetings, development of a waste data matrix including guidelines, completion of the matrix, presentation of results, report writing and finally follow up actions.

3 Working Groups, based on the size of the region or city were developed and 2 Co-leaders for each Working Group were nominated. The participants are shown in the following table:[7]

[7] Other ACR+ members showed an interest to take part to the Observatory, in particular Madrid, Belfast, Essonne, Maastricht and Castellon

Working group 1 (> 1 million inhabitants)	Working group 2 (500,000 – 1 million inhabitants)	Working group 3 (< 500,000 inhabitants)
Flanders Region (OVAM, BE) co-leader	Metropolitan Area of Barcelona (ES)[8]	Milton Keynes City Council (UK)
Catalonia (ARC, ES)	Liège Province (Intradel, BE)	Odense (DK)
Ile de France (ORDIF, FR) co-leader	Lisbon (PT)	Grand Besançon (FR)
	Porto Region (LIPOR, PT) co-leader	Aalborg (DK)
	Milan (AMSA, IT) co-leader	Oeiras (PT)
	Brussels Capital Region (BE)	Limerick County (IR)
	Regional Council of Gipuzkoa (ES)	Pamplona (ES)

Table2: ACR+ members taking part to 2009 municipal waste data comparison

The graph below indicates the variance in population across all participants:

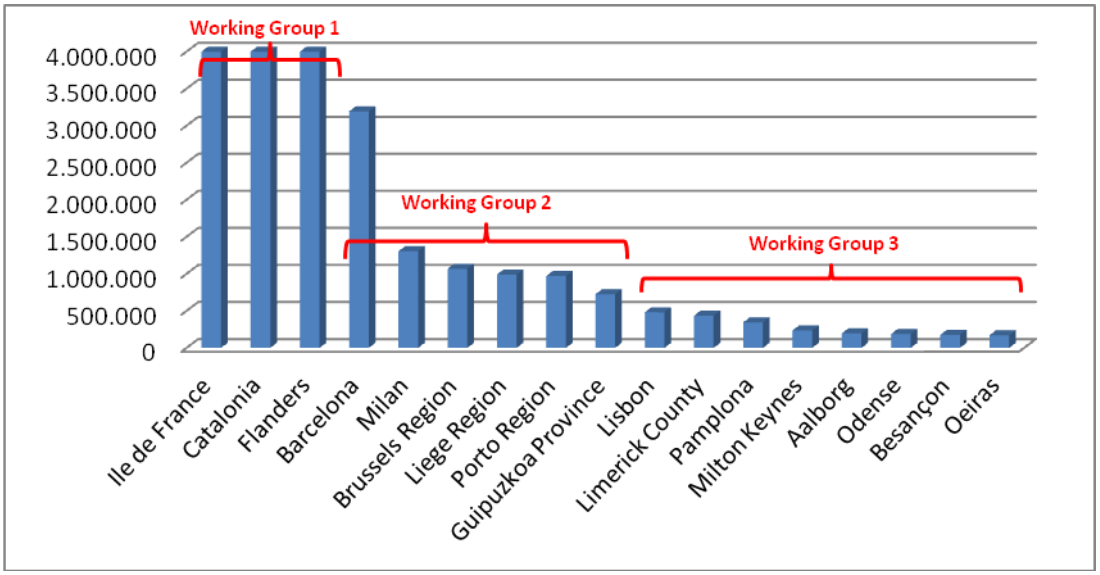


Figure 4: ACR+ Observatory – population per city/province/region (2009)[9]

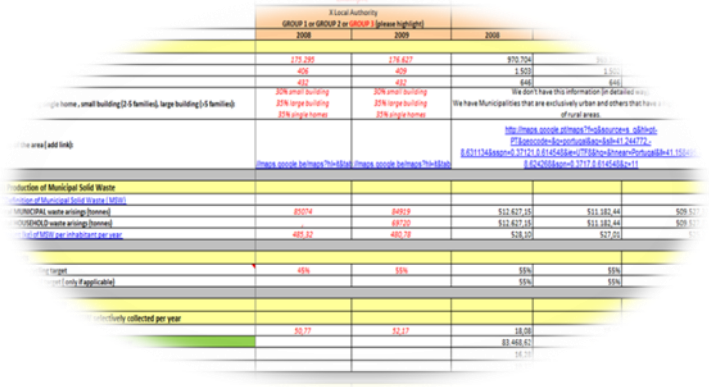
The creation of a '***Waste Data Matrix***' was the key tool to collect the data from the regional and local authorities. Key waste management indicators were selected in order to measure the collection and recycling performances (as per below). Written and oral guidelines were provided to all Observatory participants in order to ease the access and completion of the Data Matrix. The Co-leaders, with

[8] Despite a population of over 3 million inhabitants, MAB has been included in Working group 2

[9] In order to be more readable, the graph is limited to 4 million inhabitant, when actually Ile-de-France accounts for 11.729 million inhabitants, Catalonia 7.475 million inhabitants and Flanders 6.252 million inhabitants

ACR+ Secretariat, assisted the participants to fill in their data and guided them throughout the process.

The Waste Data Matrix consisted of the following key sections/indicators:



A. Demographics (no. inhabitants, housing type, density etc)
B. Production of Municipal Solid Waste (total MSW /household arisings, kg/inh/year)
C. Targets (European/National/Local)
D. Rates (total annual recycling rates, total amount of MSW recycled, selective collection, capture rate)
E. Selective collection/source separation of household/municipal waste (in tonnes and in kg per inhabitant per year)
F. Collection system - Source of collected MSW
G. Treatment

5. Data analysis results

5.1 Data analysis – global figures (all participants)

5.1.1 Municipal waste generation

Municipal waste can be interpreted in different ways. ACR+ proposes to agree on a common definition based on Eurostat's, as mentioned in chapter 7 on discussions and recommendations.

According to Eurostat, the totals of municipal waste generation in 2009 across European countries vary considerably, ranging from 316 kg per capita in the Czech Republic[10] to 831 kg per capita in Denmark.

In the case of the Observatory participants' data, the municipal solid waste generated per inhabitant in 2009 ranges from 414 to 784 kg. According to the selected data the average amount of MSW produced in the selected local and regional authorities is 557 kg/inhabitant/year. The EU-15 average, as most of the cities, provinces and regions studies are part of the EU-15, is 570 kg/inh in 2009 (source: EEA). The average kg/inh/y is thus lower than the EU-15 average. The following graph presents the variance across the Observatory participants.

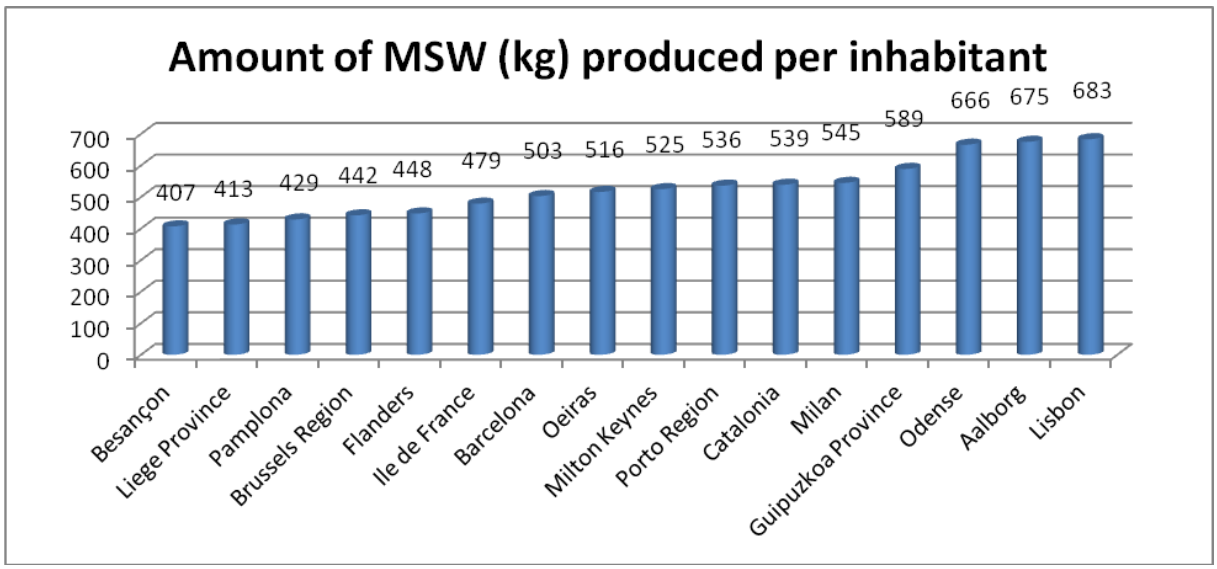


Figure 5: ACR+ Observatory – municipal waste generated in kg/inhabitant/year (2009)

The variation reflects differences in consumption patterns and economic growth of the cities and overall countries, but also depends greatly on the organisation of municipal waste collection and management. Differences between individual countries exist in particular with regard to the degree to which waste from commerce, trade and administration, street cleansing, green spaces, construction and demolition, etc. The so-called assimilated waste is collected and managed together with waste from households. The variations between the studied cities, provinces and regions are high. Households generate between 60% and 90% of the municipal waste as will be shown in the chapters presenting the results per working group.

[10] Eurostat (2009): epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-11-031/EN/KS-SF-11-031-EN.PDF

5.1.2 Selective Collection rate (%) / tonnes

Separate (or selective) collection means "the collection where a waste stream is kept separately by type and nature so as to facilitate a specific treatment"[11]. The selective collection rate assesses the percentage of waste collected separately that will be sent for recycling. The calculation formula used for the purpose of this report:

Selective Collection rate (%) =

Amount of municipal waste collected[12] selectively (kg)

———————————————————— X 100

Total amount of municipal waste generated (kg)

The following waste streams have been taken into account in the calculation methodology [13]:

Waste streams
Paper & Cardboard (packaging/non packaging)
Metal (packaging/non packaging)
Glass (packaging/non packaging)
Plastic (packaging/non packaging)
Beverage Cartons
Other (plastic metal cardboard) packaging
Green waste
Kitchen waste
WEEE
Bulky Waste
Textiles
Used Cooking Oil

[11] Directive 2008/98/EC, art. 3

[12] Collected: door-to-door, Civic amenity center, Bring Bank, etc.

[13] Data on Construction and demolition waste (C&D), wood waste and households hazardous waste have been provided by Observatory members, but not included in the selective collection calculation. This point is discussed further in chapter 7 on recommendations.

Therefore the graph below presents a range of selective collection rates from one Region/ City to the other:

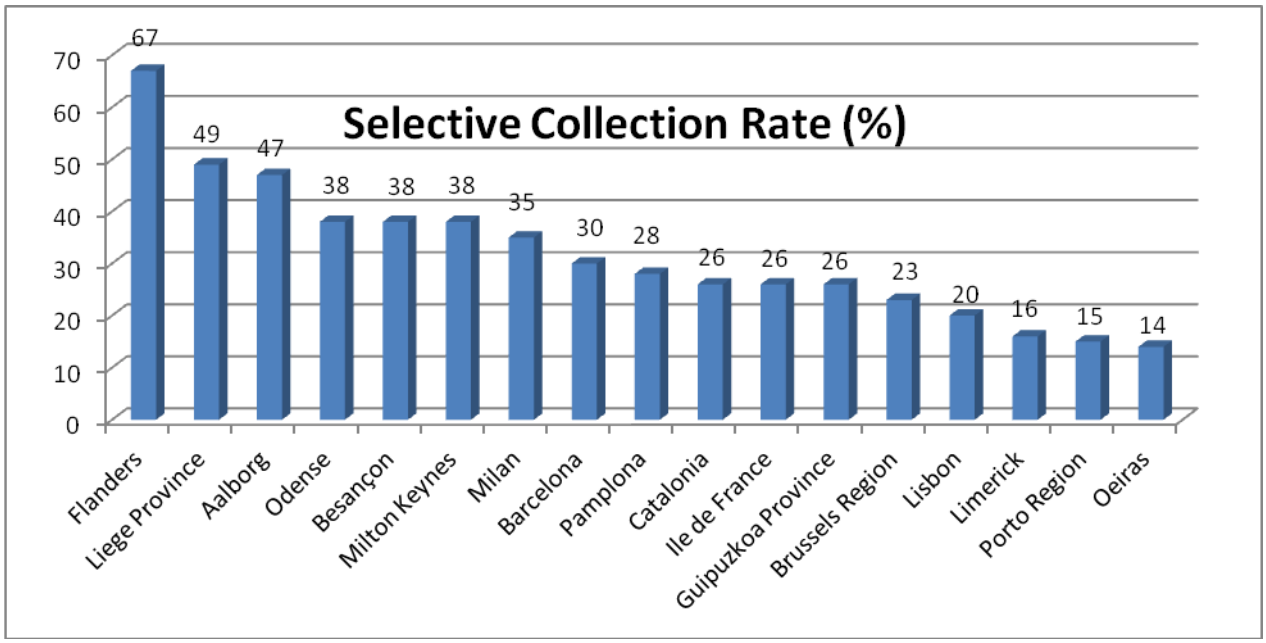


Figure 6: ACR+ Observatory – overall selective collection rate (2009)

It's worth noting that larger regions such as Ile de France, Catalonia Region, Barcelona, Brussels Region and Lisbon with a population higher than 1 million inhabitants have a selective collection rate lower than 40% whereas smaller regions such as Liège, Odense and Milton Keynes have a higher rate of 48% and above.

The exception could be considered the Flanders Region with a selective collection rate at 67%.

Flanders selective collection rate reaches 67% due to a number of policy instruments they have implemented, some of which are:

- legal instruments (e.g. legislation, penalties, producers responsibility, voluntary agreement, stimulation of the intermunicipal co-operation, etc.);
- economic instruments (e.g. levies, financial support, PAYT tax, etc.);
- social instruments (e.g. information and awareness raising campaigns, education programs at schools, etc.).

The reason for the variance between the cities in selective collection rate can be due to a number of administrative, logistical, economic, educational, market aspects, such as:

- variation in statistical data collection and or statistical bias
- the scope of municipal waste (i.e. share of assimilated waste) varies greatly, which might lead to differences in potential for recyclable waste generation
- several external factors (density, national legislation, touristic areas, etc.)
- national/ regional/ local targets setting
- effectiveness of selective collection schemes and mandatory aspects (sorting obligation or costs coverage)
- evolution of recycling activities at national, regional or local level
- availability of collection points, type and frequency of collection schemes set up
- introduction and level of implementation of economic instruments, for example: pay as you throw, landfill/incineration tax or ban, subsidies or extended producer responsibility schemes.
- level of awareness and participation of citizens in selective collection schemes

5.1.3 Overall Recycling Rate

In this section an assessment of the overall recycling rate per region/city is presented.
The overall recycling rate is calculated, using the formula below:

Overall Recycling Rate (%) =

$$\frac{\text{Amount of municipal waste selectively collected (kg)}}{\text{Total amount of municipal waste generated (kg)}} \times 100 + \text{recovered materials from MBT} - \text{Contamination rejected waste}$$

When calculating the overall recycling rates, the following treatment methodologies were considered:

- Mechanical recycling
- Composting
- Anaerobic Digestion

- Mechanical Biological Treatment (MBT), but only the output material

Limitations of the calculation method:

- In some cases it is not very clear how much of the amount of waste selectively collected for recycling purposes is actually recycled.
- More commonly the municipalities do hold accurate data of municipal/ household waste collection. Accurate data on recycling are less available as data exchange between the municipalities (or private sector collection on their behalf) and recycling industry is not always optimal

According to Eurostat[14] generally, a minority of countries include imports and exports of municipal waste for treatment in their data; even fewer provided information on the amounts in the methodological survey.

It is to be mentioned that cities and regions don't always have a clear view on waste recycling, since once collected waste goes to other operators. Therefore, the following table only covers a limited number of Observatory members.

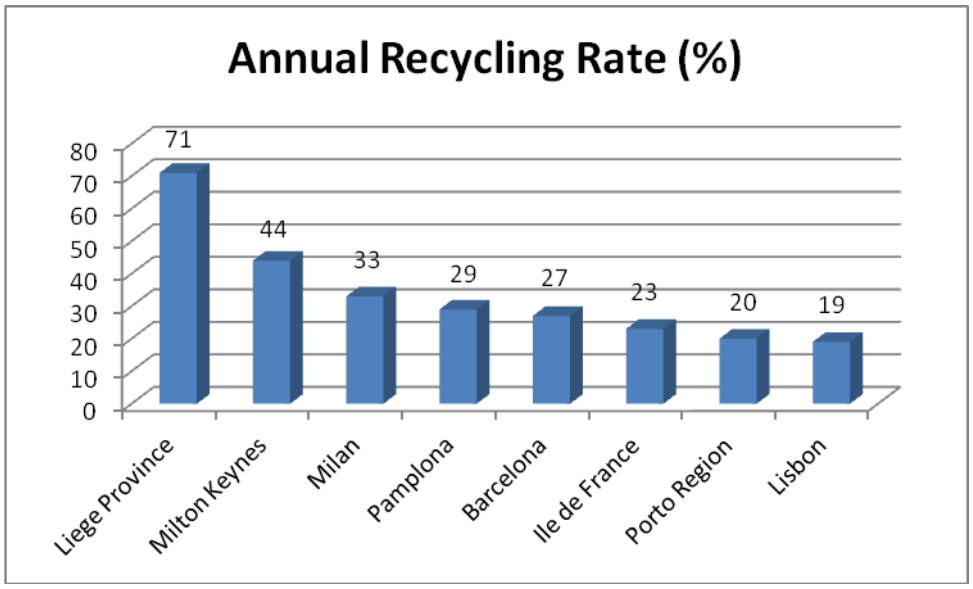


Figure 7: ACR+ Observatory – overall recycling rate (2009)

[14] http://circa.europa.eu/Public/irc/dsis/envirmeet/library?l=/municipal_luxembourg/municipal_discussion/_EN_1.0_&a=d

6. Main Waste Data Analysis (per working group)

In this section we will examine several waste indicators for the 3 different categories of regions/cities, namely larger than 1 million inhabitants, between 500,000 and 1,000,000 inhabitants and finally less than 500,000 inhabitants. The following data were analysed and presented per category:

- Selective collection per material
- Collection systems of municipal waste
- Treatment methods

Comparisons among similar regions are interesting since they can show difference of overall performances linked to different policy orientations taken at national and/or regional level.

6.1 Working Group 1 (regions/cities: > 1 million inhabitants)

The following three participants of Working Group 1 were analyzed: Ile de France (ORDIF), Flanders (OVAM) and Catalonia (ARC).

6.1.1 General overview

Data: 2009	Ile de France	Catalonia	Flanders	EU data/ targets
Population	11,729,613	7,475,420	6,251,983	
MUNICIPAL waste arisings (tonnes)[15]	5,619,090	4,026,493	2,803,709	285,000,000
Total HOUSEHOLD waste arisings (tonnes)	4,585,294	3,865,167	3,329,402	
Amount (kg) of MSW/ per inh/ per year	479	539	448	570 (EU15-2009)
National recycling Target for all municipal waste	45% of municipal waste in 2015	Within the range 55-80%		50% household waste and other

[15] Excluding construction & demolition waste and hazardous waste

				assimilated waste by 2020
	75% of packaging waste in 2012			
Regional/ Local recycling Targets	Packaging : 75% in 2019 separate targets for each fraction	48% (2007-2012)	75% MSW	50% household waste and other assimilated waste by 2020
Selective Collection Rate (%)	26%	26%	67%	

Table 3: General data for Observatory Working Group 1

Of the three regions, Ile de France has the largest amount of inhabitants: almost 12 million inhabitants. Catalonia has approximately 7.5 million and Flanders around 6 million inhabitants.

Regions are heterogeneous areas that encompass sometimes very different types of territories. For instance, the centre of Ile-de-France Region is composed of Paris and its suburb which is one of the densest areas in Europe. 20% of the Region's area is composed of urban territories, meaning that there are many sub-urban and rural zones as well. This heterogeneity leads to difficulty to draw precise conclusions related to regional waste recycling performances, since the strategies implemented in densely populated urban areas will differ from the ones implemented in rural zones.

The amount of municipal waste per inhabitant per year in these three regions is very alike. Flanders has the lowest amount (448 kg MS/inh/year) whereas the amount in Ile de France is 479 kg MS/inh/year and in Catalonia is 538 kg MS/inh/year.

France and Spain have national targets on the percentage of municipal waste targeted for recycling. Beside the national targets, the three regions have set regional targets (for Belgium, waste recycling targets are fixed at regional level). Ile de France has separate targets for each waste fraction.

There is a large difference in selective collection rate if we look at Ile de France and Catalonia on one hand, and Flanders on the other hand. The selective collection rate of Flanders is around 67% of the municipal waste. This rate is the same in Ile de France and in Catalonia with 26%.

Catalonia and Flanders do not have reliable data on the amounts of waste that are recycled after separate collection. For example, Flanders mentions that the majority of the waste that is collected separately is recycled. The only exceptions are the sorting residues that can reach 30% in some cases. A lot of the waste is recycled outside the borders of Flanders. Therefore, data on the quality of the selectively collected waste streams are not always known. Nevertheless, Flanders aims at collecting the waste streams selectively in an optimal way.

Ile de France has got separate data on the amount of recycled MSW waste per year: 23% of the total collected municipal waste is recycled (while the selective collection rate is 26%). The data shows that Ile de France generates about 6 million tonnes and has a selective collection rate of about 26% or 1/4 of the waste = +/- 1.5 million tonnes. Now the amount of recycled waste is +/- 1.1 million tonnes, which means that only 2/3 of the selectively collected waste is recycled.

6.1.2. Selective collection per material

The graph below shows the amount of waste (kg/inhabitant) that is collected selectively in the regions Ile de France, Catalonia and Flanders. Large variations in the data between the participants can be observed in the graph below:

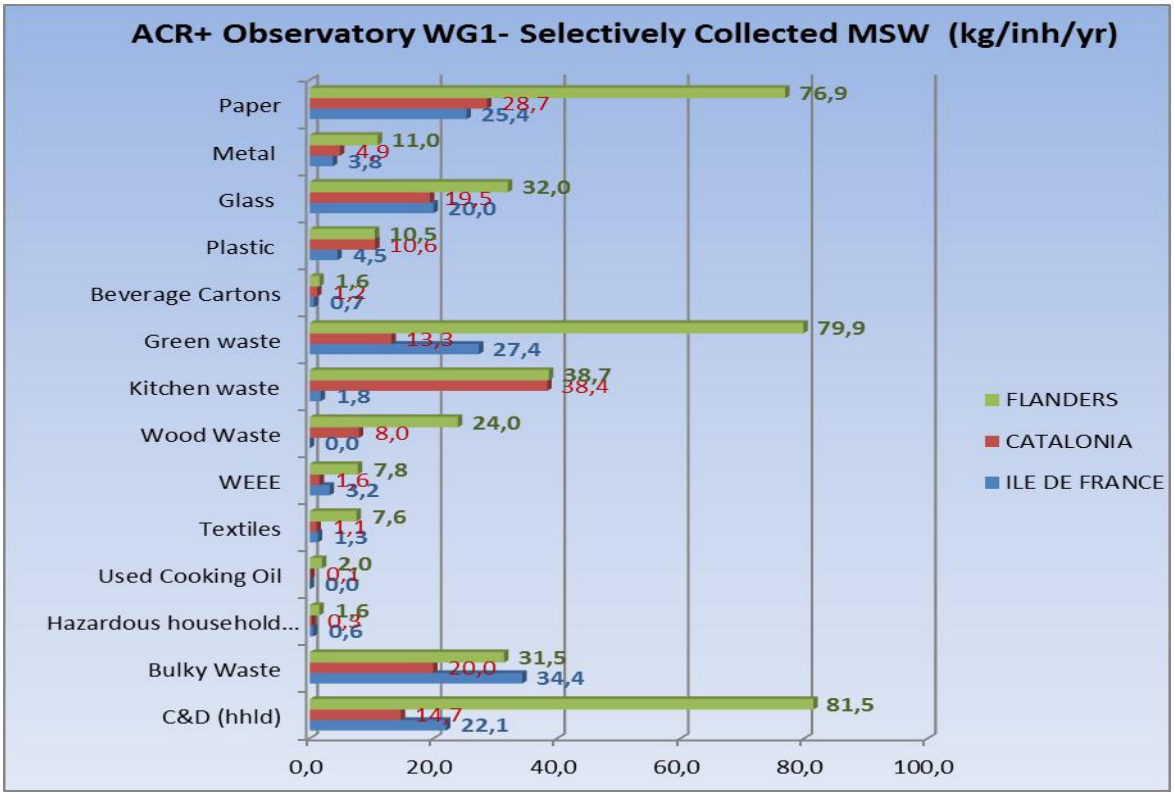


Figure 8: Amount of selectively collected waste by type in Observatory Working Group 1

In this graph, it is clear the selective collection rate in Flanders is much higher than in both other regions. In both Catalonia and Ile de France, the largest selective fraction is packaging waste (Catalonia: 9%; Ile de France: 8%). While in Flanders, packaging waste collected selectively represents 18% of the total collected municipal waste, however it is still not the largest fraction: 21% of the total municipal waste in Flanders is green waste. Together with kitchen waste (10%) about 1/3 of the municipal waste consists of bio-waste. This waste is either composted or fermented. The high amount of green waste is due to the selective collection of bio-waste at household level in large parts of Flanders.

The percentage of selectively collected kitchen waste in both Flanders and Catalonia is more or less the same: 8% in Flanders and 10% in Catalonia. Ile de France has almost no collection of kitchen waste.

6.1.3. Collection systems for municipal waste

The graph below presents annual quantities collected via different collection systems. Data are linked to global municipal waste collection, i.e. both waste collected separately and mixed residual waste.

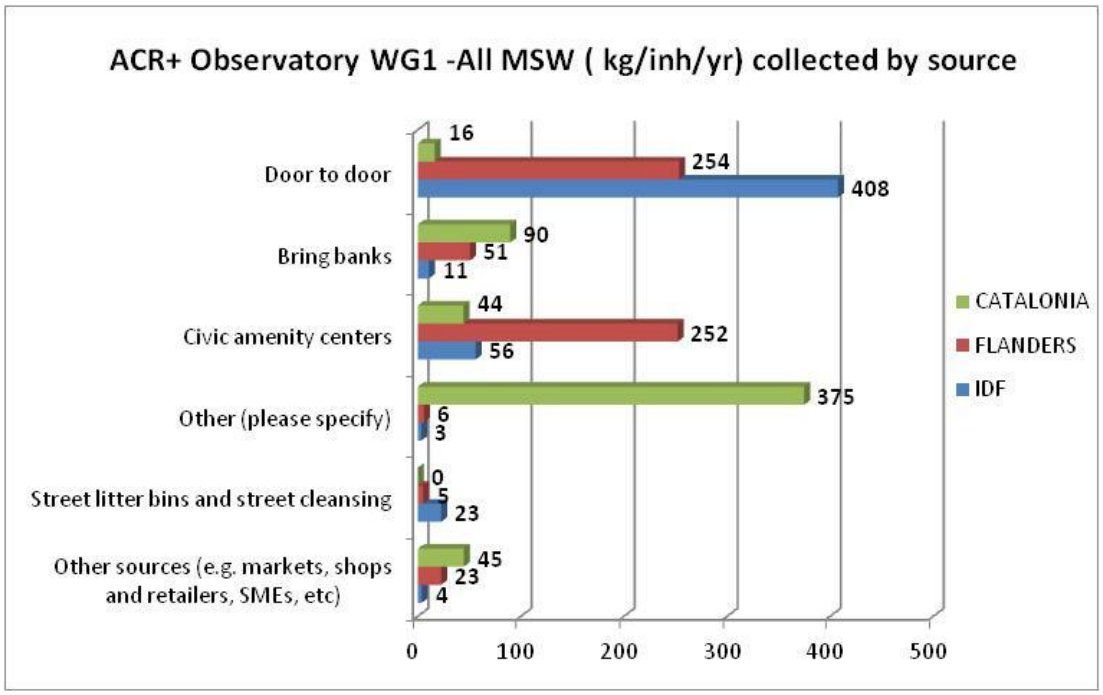


Figure 9: Amount of selectively collected waste by source in Observatory Working Group 1

It is important to note that all municipal waste flows have been considered for the above graph. It is also important to note that in Catalonia the waste is mainly collected via street litter containers, mentioned under "other" in the graph above.

All three regions, for the collection of municipal waste use as main collection systems:

- door-to-door (with the highest Ile de France at 408 kg/inh/yr)
- bring banks (with the highest Catalonia at 90 kg/inh/yr, and even more if we consider collection via street containers as assimilated to bring banks: 465 kg/inh/yr)
- civic amenity centres (with the highest Flanders at 252 kg/inh/yr).

Some important uncertainties have to be mentioned concerning "other sources" for Catalonia, which refer to residual waste, bulky waste and textiles, for which collection methods vary from one municipality to another in the Catalan region and therefore data is not available.

The graph below shows the repartition for packaging (paper, metal, plastic, glass), other non-packaging material (paper, metal, plastic, glass, wood) and biowaste (green and kitchen waste) under 3 main collection methods:

a) Door-to-door
b) Bring Bank
c) Civic Amenity centres

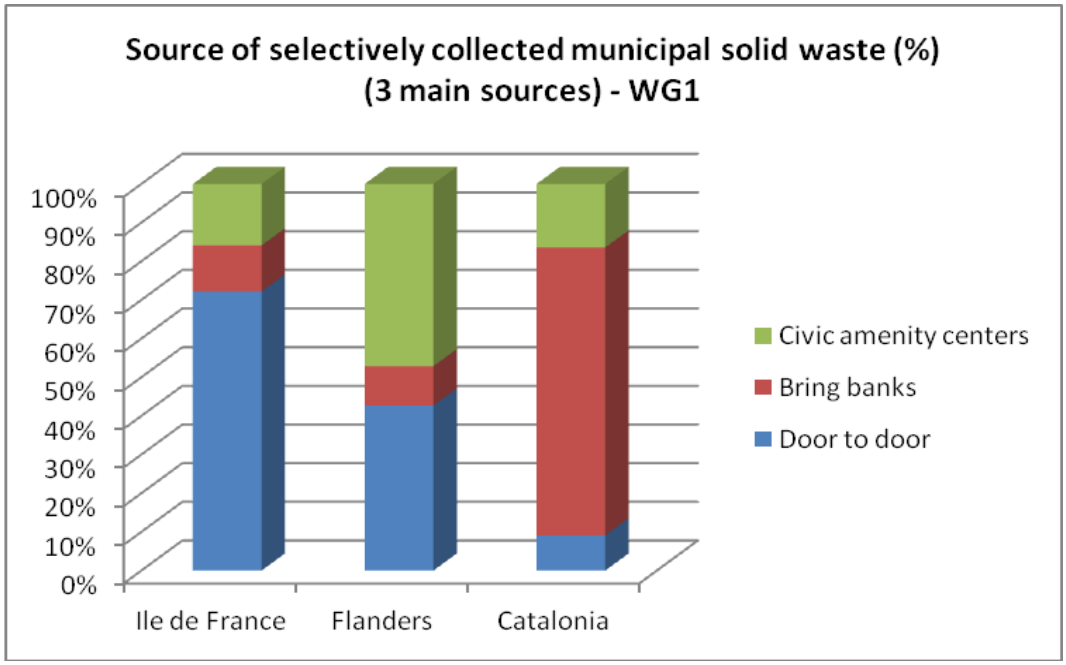


Figure 10: Share of the main selective collection systems in Observatory Working Group 1

While focusing on the 3 main systems (door to door, bring banks and civic amenity centres) it is interesting to point out that the 3 regions have their own specificities:

- In Flanders, selective collection via civic amenity centres amounts to almost half of total selective collection (47%), and is notably higher than in the 2 other territories (16% in both Ile-de-France and Catalonia). This might be a result of different 'cultures' or policy options.
- In Catalonia, data shows the relative importance of bring bank collection compared to door to door and civic amenity centres. They are mainly used for packaging waste and green waste. In Catalonia 3/4 of the packaging, other non packaging material and bio-waste collected selectively is done by a bring bank scheme, while in Ile de France and Flanders this is only a rather small percentage (Ile-de-France: 12%; Flanders: 10%).
- Ile-de-France Region data show an extensive use of door to door collection. The door-to-door collection is the highest in Ile-de-France (72%), followed by Flanders (43%) and Catalonia (9%).

The composition of waste selectively collected by method of collection is presented below. The quantities presented below are in kg per inhabitant per year so that comparisons can be made regarding collection performances.

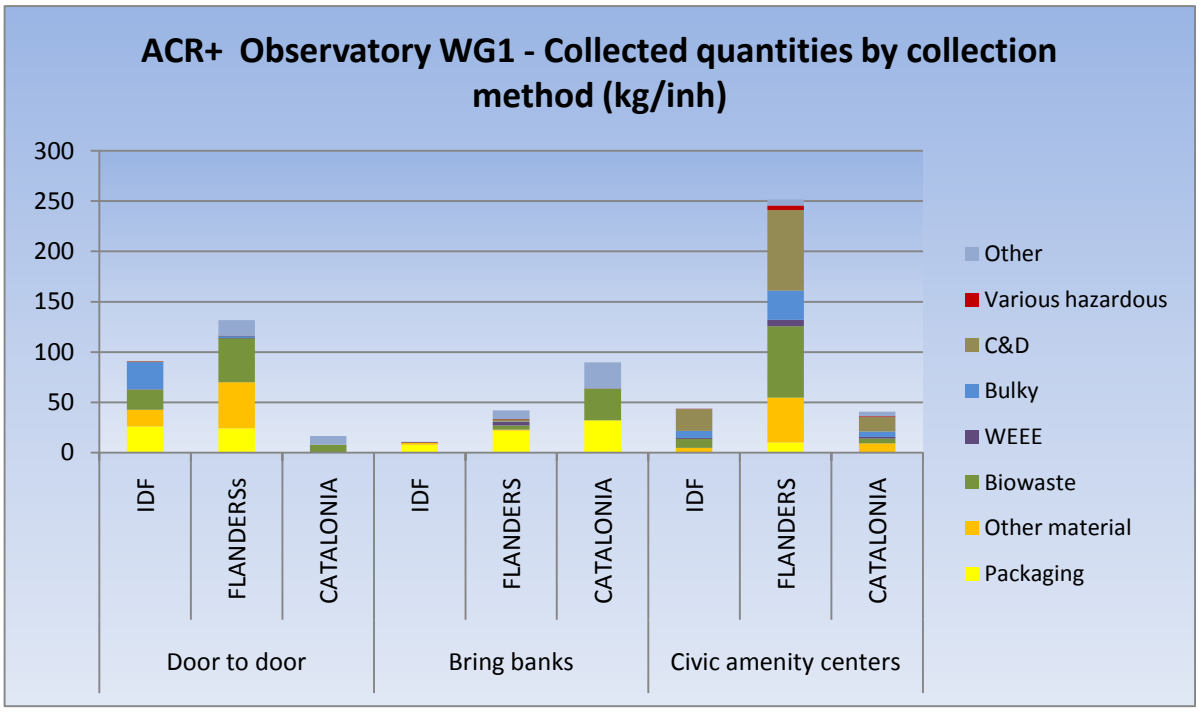


Figure 11: Collected quantities by collection systems in Observatory Working Group 1

To be noted: “Other material” refers to non-packaging waste, wood waste, textiles, used cooking oil.

This graph shows the high collection performances in Flanders for dry recyclables and bio-waste through both door to door and civic amenity centres. Flanders’ civic amenity centres allow to collect important quantities of a variety of waste streams (up to 25 different waste streams).

In order to have a better understanding of quantities collected though CAC, it is interesting to compare the number of civic amenity centres per inhabitant as well as the part of similar waste in these flows, since it might explain selective collection results. Regarding the number of civic amenity centres, the following figures can be considered:

- Ile-de-France Region: 71,000 inhabitants per centre
- Catalonia: 26,000 inhabitants per centre
- Flanders Region: 20,000 inhabitants per centre

The high number of civic amenity centres in the Flanders Region might explain high collection performances. Further information regarding the location of these civic amenity centres and the part of the population having an access to these centres could be relevant ; for instance, very few centres are available in the dense part of Ile-de-France Region due to lack of space, which means that a large part of the regional population have a limited access to them. This could explain low performances in Ile-de-France. This also explains the important quantity of mixed bulky waste collected door to door in Ile-de-France. In Flanders, the goal is to have at least one civic amenity centre for each 30,000 inhabitants. This goal has yet been achieved and surpassed. The civic amenity sites are located at the borders of the city centres, on industrial sites, next to highways or railways. So even in big cities, space can be found for civic amenity sites.

6.1.4. Treatment of municipal waste

Treatment methods used in the 3 regions are summarised on the graph below.

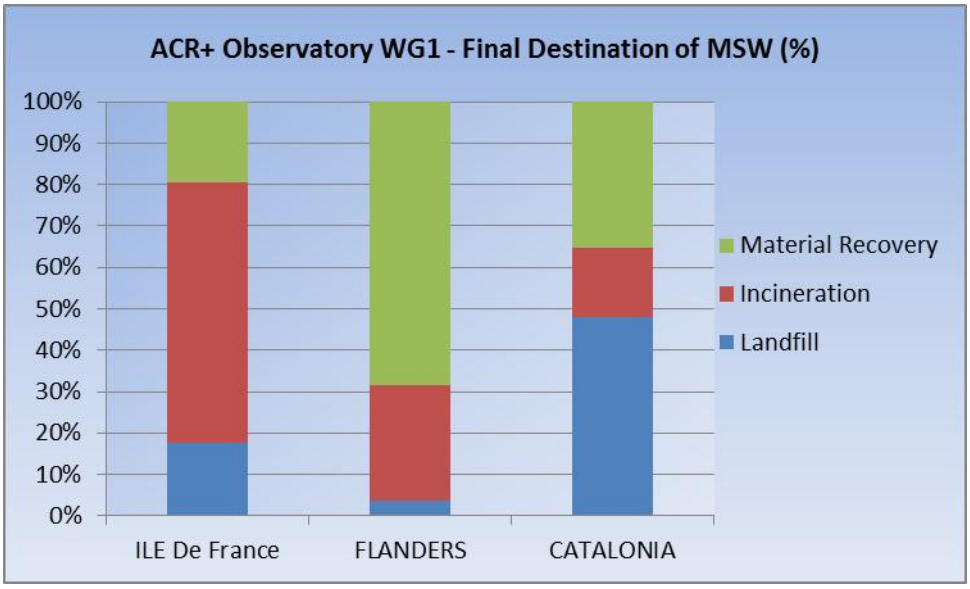


Figure 12: Treatment methods in Observatory Working Group 1 (%)

For the purpose of this exercise, material recovery covers:

Mechanical Recycling+ Composting + Anaerobic Digestion

Based on the above graph, it is interesting to highlight that:

- In Ile-de-France Region incineration with energy recovery is used for about 60% of the total treated quantities.
- In Flanders, treatment reflects the performances of selective collection, since recycling reaches almost 70% of the total treated quantities. The figure also shows the preference given to incineration with energy recovery for the treatment of the residual fraction.
- In Catalonia, disposal through landfilling is the main method of treatment, reaching more than 40% of the total treated quantities. The figure also shows the importance of mechanical biological treatment compared to the other territories. The part of recycling is higher than in Ile de France, reflecting the better performances of selective collection for both materials and bio-waste.

The figure below gives more detail about the treatment methods used for municipal waste in the 3 regions :

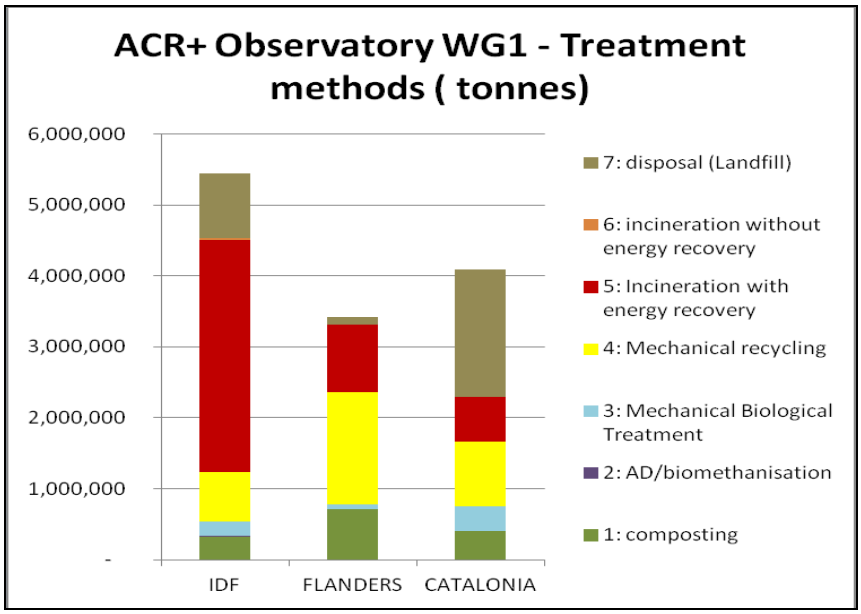


Figure 13: Treatment methods in Observatory Working Group 1 (tonnes)

This figure reflects the differences in selective collection rates, since the part of waste sent to recycling (both mechanical and organic recycling) is far higher in Flanders than in other territories. It also shows that different technological choices have been made depending on the territory:

- Flanders has the highest material recovery (2,295 million tonnes) followed by Catalonia (1,312 million tonnes) and Ile de France (1,026 million tonnes)
- Incineration with energy recovery is higher in Ile de France (3,301 million tonnes) followed by Flanders and Catalonia
- Catalonia has the highest landfill activities (1,795 million tonnes) followed by Ile de France (917,000 tonnes)
- Mechanical biological treatment is more used in Catalonia than in the other Regions.
- Anaerobic Digestion activities are only reported in the Ile de France region, where 14,200 tonnes of organic waste were treated through AD in 2009. Neither Flanders or Catalonia reported any AD activities for the treatment of municipal waste

6.2 Working Group 2: (regions/cities: 1 million – 500,000 inhabitants)

Working Group 2 (WG2) consists of the following Regional and Local Authorities:

- AMSA - Milano (IT)
- Lipor - Porto region (PT)
- IBGE - Bruxelles (BE)

- Area Metropolitana de Barcelona (AMB)(ES)
- INTRADEL – Liège Province (BE)
- Municipality of Lisbon (PT)
- Provincial Council of Gipuzkoa (ES)

WG2 includes medium to large cities/regions between 500,000 to 1,000,000 inhabitants with the exception of Area Metropolitana de Barcelona (AMB) with over 3 million inhabitants.

Comparison among these regions is intended to show differences of overall performances linked to different orientations in waste management. However, these regions are heterogeneous areas that encompass very different types of territories. Milan comprehends just the city of Milan without suburbs, high population density in a small territory, Porto includes the city and 8 surrounding municipalities, Liège Province and Gipuzkoa includes big cities and large territories with rural areas. This heterogeneity is to be considered before drawing conclusions related to regional waste recycling performances.

6.2.1 General overview

Data: 2009	Barcelona	Milan	Brussels	Liège Province	Porto region	Lisbon	Guipuzkoa Province
Population	3,192,778	1,303,964	1,068,532	990,608	969,970	479,884	723,128
MUNICIPAL waste arisings (tonnes)[16]	1,606,674	710,967	472,269	408,701	519,812	327,576	426,047
Total HOUSEHOLD waste arisings (tonnes)	not counted separately	not counted separately	321,074	410,515	493,323.67	282,720	287,831
Amount (kg) of MSW/ per inh/ per year	503	545	442	414	536	683	590
National Target	55%	65% by 31/12/2012	N/A	N/A	55%	55%	55%
Regional/ Local Targets	48 % (year 2012)	65% by 31/12/2013	50% (2020)	N/A	Follow national targets	N/A	N/A

[16] Excluding construction & demolition waste and hazardous waste

Selective Collection Rate (%)	30	35	23	49	15	20	27
Total amount (tonnes) of recycled MSW per year	441,547	238,146	108,336	289,911	102,193	64,148	175,918

Table 4: General data for Observatory Working Group 2

Waste generation per capita shows very different values among the regions, ranging from 414 kg/inh per year of Liège to the 683 kg/inh per year of Lisbon. These differences reflect different consumption styles and citizens behaviours but are also affected by commuters presence as in the case of Lisbon, and the inclusion/exclusion of similar waste (waste from commercial premises, offices, etc.).

Selective collection rates are also very different from each other, ranging from 15% of Porto region to 49% of Liège Province.

6.2.2. Selective collection per material

Based on the waste data matrix that all WG 2 participants completed with very detailed information we made the following considerations before comparing data.

- Similar waste (waste from commercial premises, offices, etc, but of the same type as household waste) is included in the evaluation because in most cases it was not possible to separate it from household waste. Still there are some uncertainties concerning this issue.
- Subdivision packaging / non-packaging data is mostly unavailable and it is also subject to misinterpretation so it was elimanted from our elaboration and only the total amount of paper, metal, glass and plastic was taken into account
- Some multi-material data are not broken down by categories (plastic, paper, metals) so are shown as a separate category (mixed packaging) due to the way municipalities collect their data.
- Some uncertainties remain regarding hazardous waste, and other small categories (i.e. clinical waste).

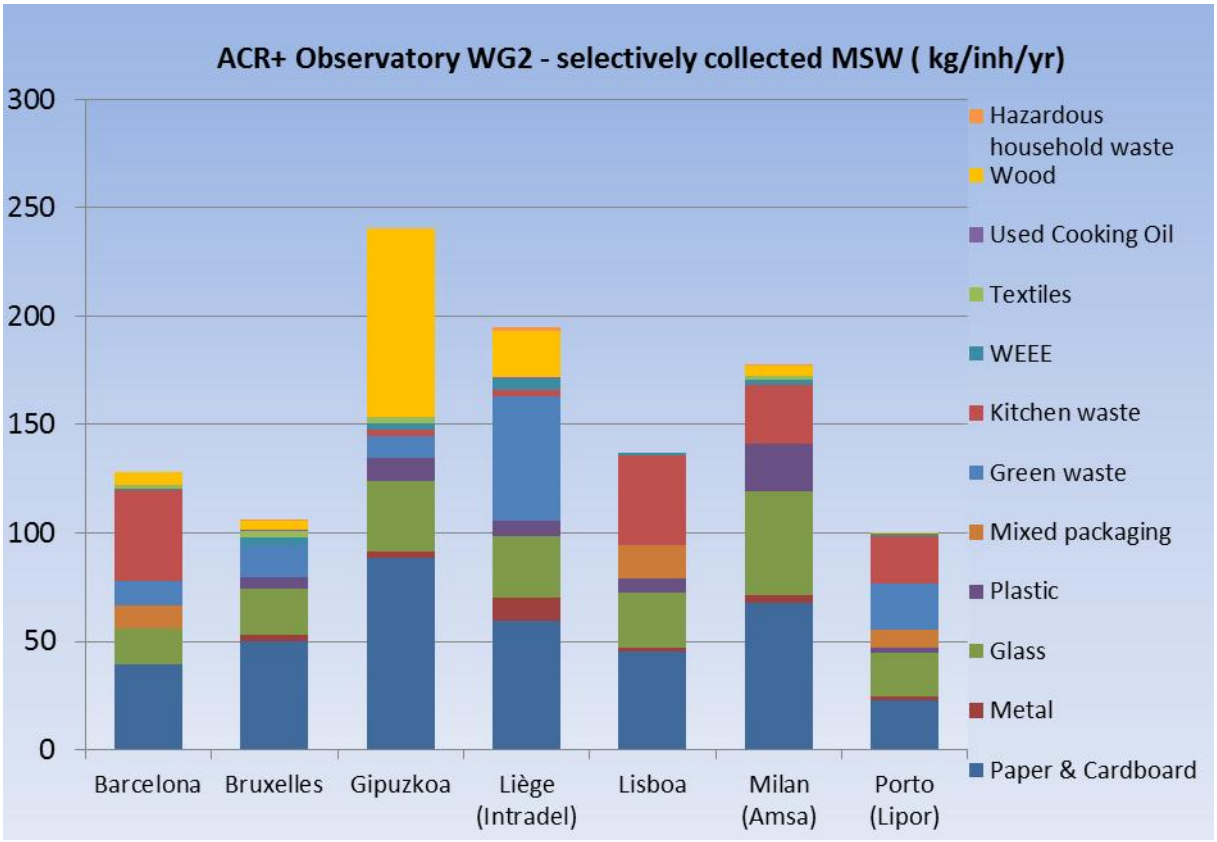


Figure 14: Amount of selectively collected waste by type in Observatory Working Group 2 (tonnes)

The graph above shows data of the main fractions quantities (kg/inh per year) of the collected MSW.

- Paper & cardboard show a good selective collection performance, ranging from 40kg/inh/yr (Barcelona) up to 88 kg/inh/yr (Gipuzkoa).
- Glass waste selectively collected ranges from 16 kg/inh/yr to 48 kg/inh/yr.
- Kitchen waste collection varies a lot; high performances in Barcelona (42 kg/inh), Lisbon (41 kg/inh) Porto region-Porto (23 kg/inh) and Milan, while it is very low or not operating at all in Liège Province (3 kg/inh), Gipuzkoa (3 kg/inh) and Brussels.
- Milan , amongst the other participants has a high selective collection for plastic (21,4 kg/inh) and glass packaging (48,3 kg/inh) while Liège Province is performing really well in green waste collection (56,9 kg/inh, mainly from professionals.

As mentioned above some waste fractions vary greatly in quantities between the regions/cities. For example Gipuzkoa declared more than 80 kg/inh per year of collected wood which is way above all the other values (mostly around 5 kg/inh per year). Such a high collection of wood makes up 15% of the total amount of MSW. Wood waste in Gipuzkoa may originate from both household and private sector premises, hence it's high performance.

6.2.3. Source of collected municipal solid waste

The graph below presents annual quantities collected via different sources for municipal waste. Data are linked to global municipal solid waste, i.e. both waste collected separately and mixed residual waste.

Focusing on the 3 main sources (door to door, bring banks and civic amenity centres), the graph below shows the repartition of collection method for MSW:

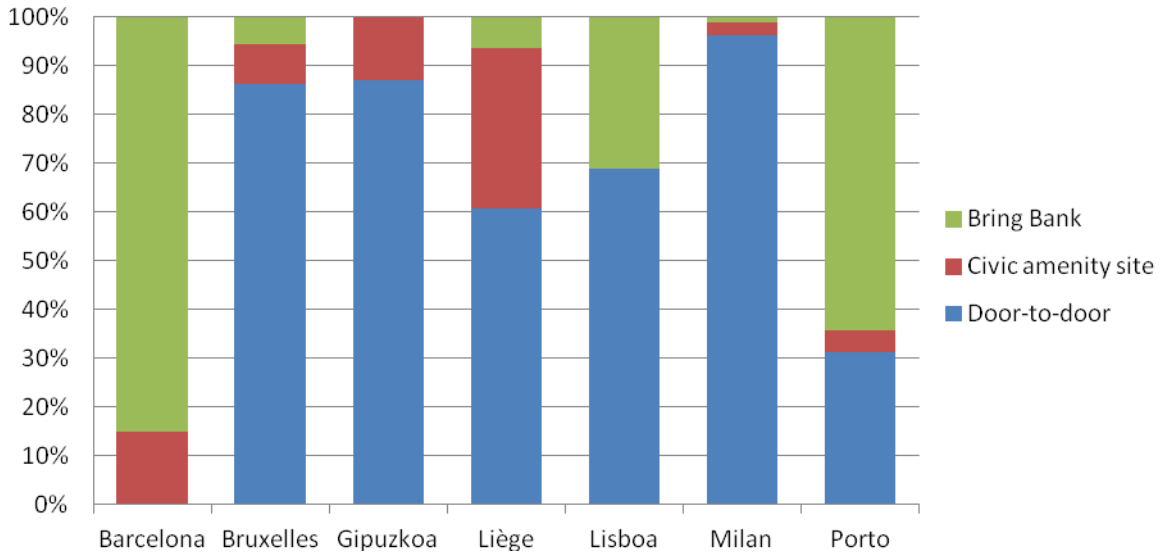


Figure 15: Share of the main selective collection systems in Observatory Working Group 2

It is interesting to point out that each region has its own specificities:

- Brussels, Gipuzkoa, and Milan have shown an extensive use of door to door collection (more than 80%). In reality, Gipuzkoa use street containers (bring banks) for the collection of municipal waste but they refer to it as 'door-to-door' collection. This could be the case for Milan and Lisbon as well.
- For Liège Province, collection via civic amenity centres amounts to more than 30% of total collection, and is notably higher than in the other territories.
- Bring banks in Lisbon, Porto, and Barcelona refers to street containers, while in Milan for example are used only for paper and glass in areas of the city where door to door is difficult
- Barcelona reported a very small amount for door-to-door collection of municipal waste as the majority of the waste is selectively collected via bring banks (or street containers).

- Underground pneumatic waste collection systems (or street containers) are located across the city in Barcelona.
- In the Liège Province, buried bring banks (i.e. for glass bottles) are located across the region.

The high number of civic amenity centers in Liège might explain high collection performances in bulky waste, WEEE and wood collection.

Further information regarding the location of these civic amenity centres and the part of the population having an access to these centres could be relevant; for instance, very few centers are available in Milan due to lack of space, which means that a large part of the population have a limited access to them. Free bulky waste collection on request in Milan partly balances the scarcity of civic amenity sites.

6.2.4. Treatment of municipal solid waste

Treatment methods used are presented on the graph below. These values usually refer to the final treatment, which means that refusal rates are included, although some uncertainties remain.

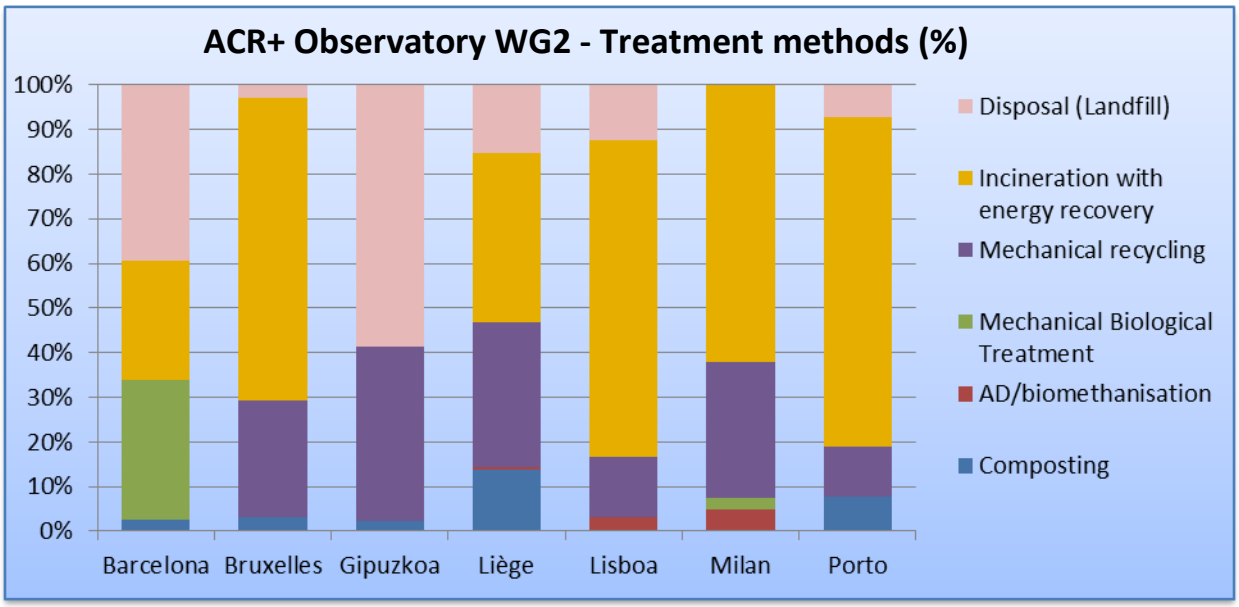


Figure 16: Treatment methods in Observatory Working Group 2 (%)

This figures mainly shows the following points:

- The higher sorting performances Gipuzkoa, Liège and Milan are reflected in higher recycling (composting and mechanical recycling).

- Incineration with energy recovery is the main treatment method for the majority of cities and landfilling is the main method in Barcelona and Gipuzkoa.
- Mechanical biological treatment activities for municipal waste are highly present in Barcelona (31,23%) and very little in Milan (2,39%)
- Milan and Brussels have reported '0' waste going to landfill, all municipal waste has been recorded under mechanical recycling, composting, AD,incineration with energy recovery

In the following graph we have summarised the treatment options into:

- material recovery
- incineration with energy recovery
- landfill

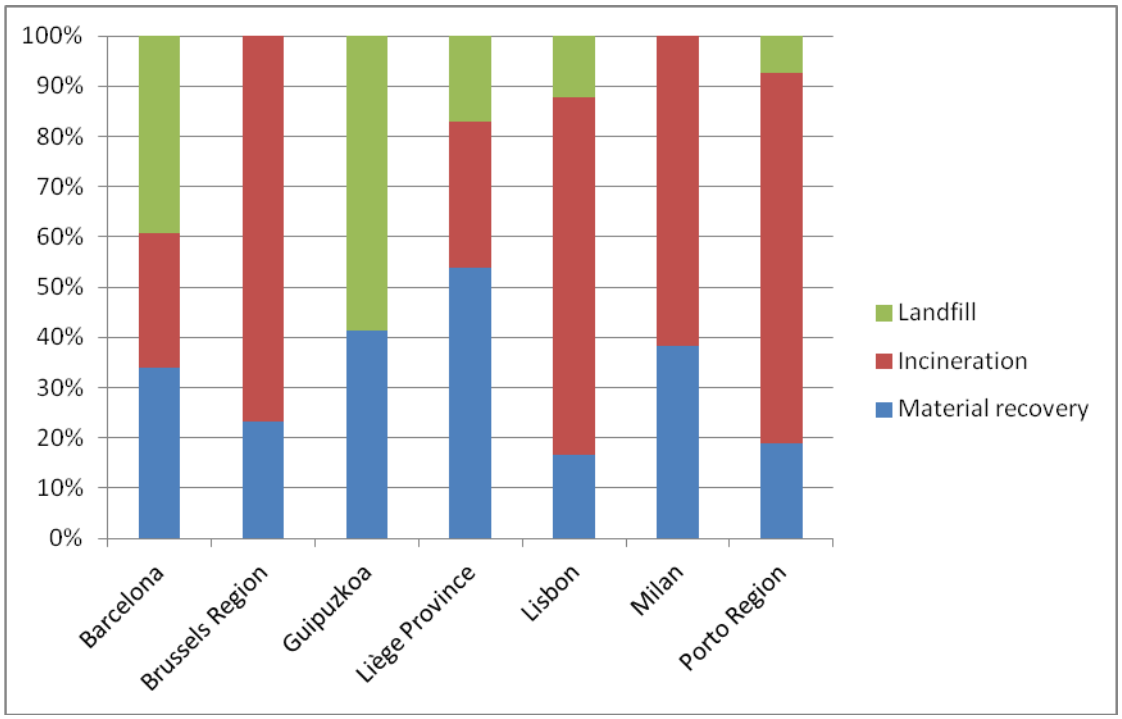


Figure 17: Share of the main treatment methods in Observatory Working Group 2 (%)

For the purpose of this exercise, material recovery covers:

Mechanical Recycling+ Composting + Anaerobic Digestion

It's interesting to highlight that only Barcelona and Milan are using MBT facilities whereas the rest use mechanical recycling and / or incineration with energy recovery. The highest material recovery rates are reached in Liège, Gipuzkoa and Milan.

With respect to Incineration only incineration with energy recovery is used and Milan (440,871 tonnes) and Bruxelles (338,745 tonnes) have the highest input tonnages. There are no regions using incineration without energy recovery.

6.3 Working Group 3: (< 500 000 inhabitants)

Working Group 3 (WG3) consists of the following Regional and Local Authorities:

- Odense (DK)
- Grand Besançon (FR)
- Pamplona (ES)
- Oeiras (PT)
- Milton Keynes (UK)
- Aalborg (DK)
- Limerick (IE)

6.3.1 General overview

The following table summarises the key waste management performances for each region. Despite the fact that these regions belong to the same Working Group due to similar population size, they are still heterogeneous areas that encompass very different types of territories.

	Odense	Grand Besançon	Pamplona	Oeiras	Milton Keynes	Aalborg	Limerick
Population (inhabitants):	187,000	176,627	344,872	171,472	236,700	196,292	434,840
MUNICIPAL waste arisings (tonnes) [17]	124,585	71,826	148,031	88,536	124,261	132,427	310,132
Total household waste arisings	Not counted separately	Not counted separately	Not counted separately	Not counted separately	114,955	128,734	Not counted separately

[17] Excluding construction & demolition waste and hazardous waste

Amount (kg) of MSW per inhabitant in 2009	784	481	437	516	550	698	713
National recycling target	50%	45% of municipal waste in 2015 75% of packaging waste in 2012	Within the range 55-80%	55% - 80%	50%	62%	N/A
Selective collection rate (%)	38%	38%	28%	14%	38%	47%	16%
Total amount (tonnes) of recycled MSW per year	77,195	32,010	43,623	35,976	53,568	53,882	233,636

Table 5: General data for Observatory Working Group 3

The third Working Group is defined by a maximum number of inhabitants of 500,000. The range in this WG is from 171,000 to 435,000 inhabitants, with an average of 250,000 inhabitants. Oeiras is by far the most densely populated region at 3,744 inhabitants/km^2 followed by Milton Keynes at 766 inhabitants/km^2 whereas Aalborg has a population density of 173 inhabitants/km^2 and Limerick is the least densely populated municipality with 41 inhabitants/km^2.

The total MSW production is indicated, the maximum being 310,132 tonnes in Limerick and the minimum 85,000 tonnes in Grand Besançon. When assessing the amount of municipal waste per inhabitant per year in these regions we observe large variation between them. Odense is producing the highest amount of MSW at 784 kg per inhabitant per year followed by Limerick at 713 kg per inhabitant per year. Pamplona has the lowest amount of waste generation per inhabitant at 437 kg.

The large variation between the cities could be due to the different municipal solid waste definition they have adopted. Meaning that in many cases commercial waste might be included within the total amounts of municipal waste (i.e. Limerick) but there are cases where commercial waste have been excluded (i.e. Odense).

The selective collection rate varies greatly from Aalborg at 47% to Oeiras at 14%. It is to be noted that Limerick's selective collection rate (16%) has been calculated on the basis of household waste (not municipal waste, since commercial waste is included in its municipal waste and biases the result.

In some regions there seems to be a great difference between the collected MSW and the recycled MSW. This difference could be due to a number of factors such as possible contaminated loads that might lead to these differences.

6.3.2. Selective collection per material

Based on the waste data matrix that all WG 3 participants completed with very detailed information we made the following considerations before comparing data.

- Subdivision packaging / non-packaging data is mostly unavailable and it is also subject to misinterpretation so it was elimanted from our elaboration and only the total amount of paper, metal, glass and plastic was taken into account.
- Similar waste (waste from commercial premises, offices, etc, but of the same type as household waste) is included in the evaluation because in most cases it was not possible to separate it from household waste. Still there are some uncertaintes concerning this issue. It explains for instance the high amount of MSW per inhabitant for Limerick.
- Some uncertainties remain regarding hazardous waste, and other small categories (tyres, used cooking oil).

The graph below shows the amount of waste (kg/inhabitant) that is collected selectively in all 7 regions. For construction and demolition and hazardous household waste we have observed large variations in the data between the participants.

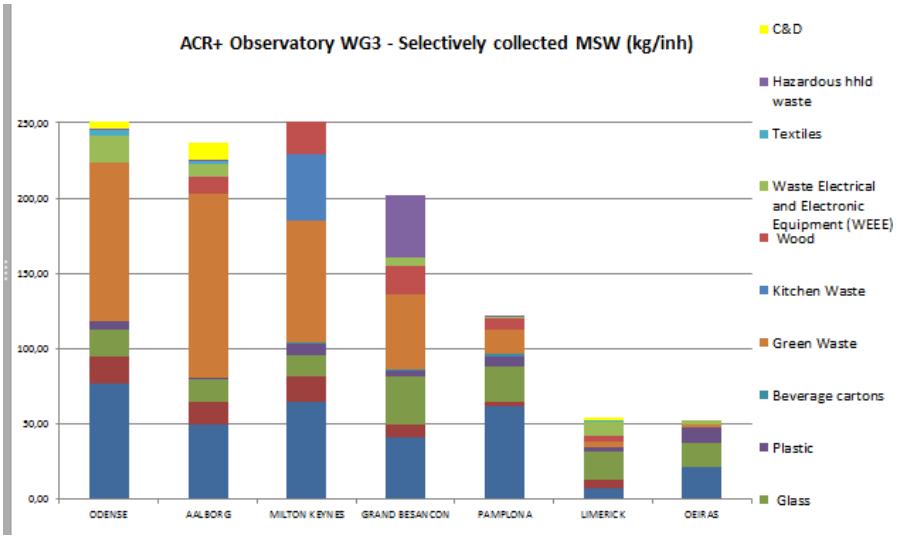


Figure 18: Amount of selectively collected waste by type in Observatory Working Group 3 (tonnes)

The graph above shows data of the main fractions quantities (kg/inh per year) of the collected MSW.

- Odense reaches the highest selective collection rate in the majority of the waste fractions such as paper & cardboard,metal, green waste, WEEE and textiles.
- Milton Keynes is the only Local Authority within this group that operates a kitchen waste collection service (44 kg/inh)
- Aalborg reaches the higest amount of green waste selectively collected amongst the other participants in the group (121 kg/inh), followed by Odense (105 kg/inh), Milton Keynes (81 kg/inh), Grand Besançon (50 kg/inh) and Pamplona (15 kg/inh)
- Grand Besançon has the highest glass selective collection rate (32 kg/inh) followed by Pamplona (24 kg/inh) and Limerick (19 kg/inh)
- Odense has the highest selective collection rate for WEEE (18 kg/inh) ,followed by Aalborg (9 kg/inh), then Limerick (8.8 kg/inh).
- Textiles cover a very small fraction of selectively collected waste with the highest being Odense at 3 kg/ inh per year. Grand Besançon and Oeiras have not recorded any amount of textile selectively collected.

6.4.3. Source of collected municipal solid waste

Focusing on the 3 main sources (door to door, bring banks and civic amenity centres), the graph below shows the repartition of collection method for MSW.

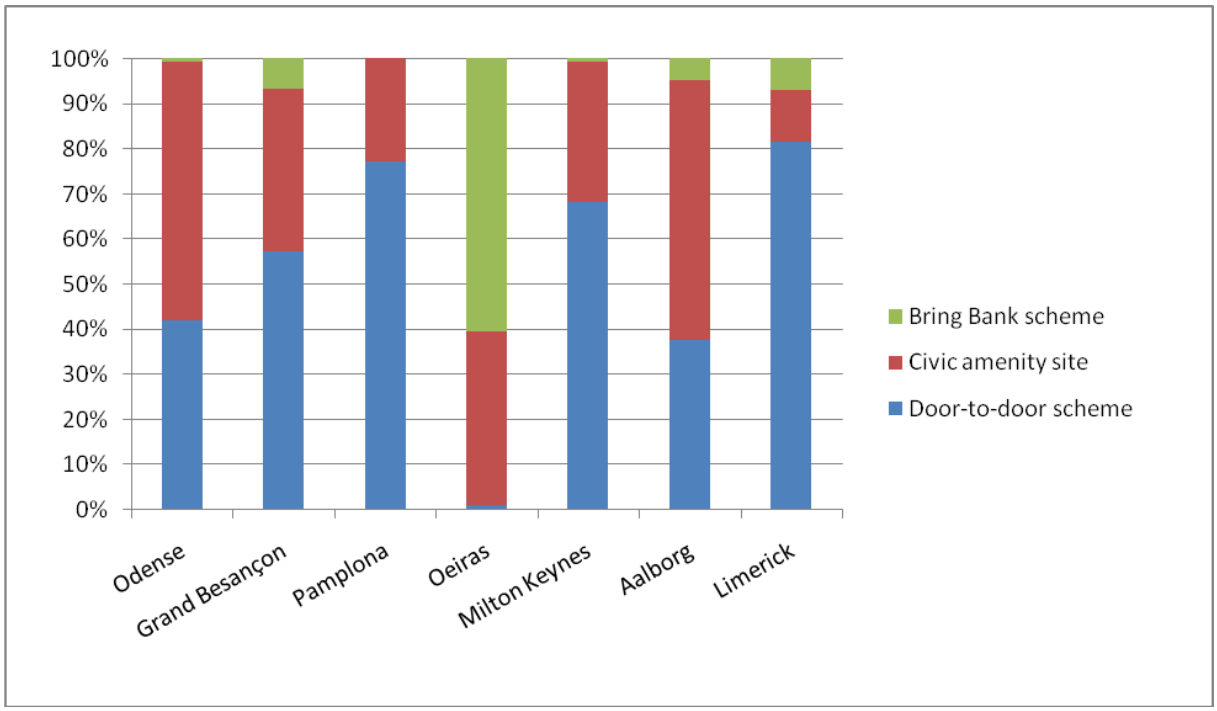


Figure 19: Share of the main selective collection systems in Observatory Working Group 3

The graph above illustrates the variation of collection methods in each region and the quantities collected. It is obvious that the door-to-door collection, civic amenity centre and bring banks are the most popular sources. Also it is interesting to note that:

- Limerick has the highest relative and absolute amount of waste selectively collected via door-to-door (81%; 90,493 tonnes). In absolute numbers, Milton Keynes (79,582 tonnes) and Odense (63,365 tonnes) follow Limerick.
- Grand Besançon collects municipal waste from various commercial premises which in 2009 accounted for only 428 tonnes.
- The municipality of Oeiras provides a collection service for municipal waste from institutions such as schools, hospitals and civic offices. In 2009 they reported 11,097 tonnes of municipal waste collected from those sources. It also recorded 14,780 tonnes collected via street litter bins.
- Milton Keynes and Limerick also collects municipal waste from commercial premises and street litter bins.

It is interesting to point out that each region has its own specificities:

- Limerick, Pamplona, Milton Keynes, and Grand Besançon have shown an extensive use of door to door collection (more than 50%) with the highest rate in Limerick at 81%.
- For Oeiras, the use of bring banks (street containers) for the collection of municipal waste reaches 60% out of the total amount of municipal waste collected.
- Civic Amenity Centres are highly used by the majority of the regional/local authorities to dispose of municipal waste. The highest usage of CA Centres is in Aalborg at 58% followed by Odense at 57%. The remaining regions use the Civic Amenity Centres but at lower rate, less than 40%.

6.4.4. Treatment Methods

Treatment methods used are summarised on the graph below into:

- material recovery (composting + Mechanical Biological Treatment and/or Mechanical recycling)
- incineration
- landfill

These values usually refer to the final treatment, which means that refusal rates are included, although some uncertainties remain. Incineration residues are included under incineration though.

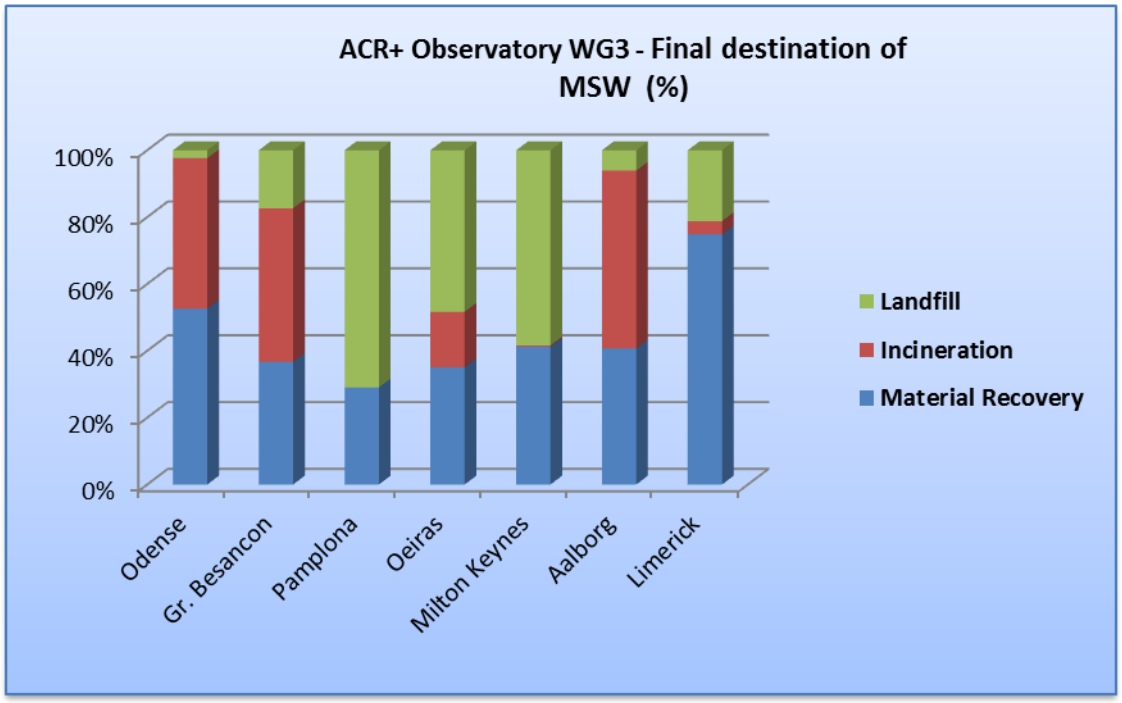


Figure 20: Share of the main treatment methods in Observatory Working Group 3 (%)

This figures mainly shows the following points:

- The higher sorting performances in Odense, Aalborg and Milton Keynes are reflected in higher recycling treatment (composting and mechanical recycling) and lower incineration and disposal.
- Incineration with energy recovery is the main treatment method for Aalborg , Odense and Grand Besançon whereas landfilling is the main method used in Pamplona to dispose of municipal waste, reaching 70%.
- Mechanical biological treatment is operating only in Aalborg and Limerick.
- Landfilling remains high in Pamplona and Milton Keynes.

7. Points of Discussion and recommandations

The following conclusions were made during the 2nd Observatory meeting in April 2012 and should be considered for future use.

I. *Agree on definition of Municipal Solid Waste/ HHLD indicator*

We shall continue on the basis of the definition given by EUROSTAT:

Definition of Municipal Solid Waste (MSW):

- Waste originating from households, commerce and trade, small businesses, office buildings, institutions and from selected municipal services, (waste from parks and garden maintenance and street cleaning services); collected by or on behalf of municipalities.
- Waste from the same sources and similar in nature and composition collected by the private sector and waste from rural areas not served by a regular waste service. **(source: Eurostat)**

It will be useful to have three columns on the waste data matrix to distinguish between household waste, similar waste and the total municipal waste (only where possible). Where exact data is not available, an estimation could be provided.

II. *Total waste generation*

When calculating the total waste generation, all waste flows should be taken into account (total waste arising from the different sources):
Municipal waste includes household and similar waste.

The definition also includes:

—bulky waste (e.g. white goods, old furniture, mattresses); and

—garden waste, leaves, grass clippings, street sweepings, the content of litter containers, and market cleansing waste, if managed as waste.

It **includes waste originating from:**

—households;

—commerce and trade, small businesses, office buildings and institutions (schools, hospitals, government buildings).

It also includes:

—waste from selected municipal services, i.e. waste from park and garden maintenance, waste from street cleaning services (street sweepings, the content of litter containers, market cleansing waste), if managed as waste.

It includes collected waste from these sources:

—door-to-door through traditional collection (mixed household waste), and

—fractions collected separately for recovery operations (through door-to-door collection and/or through voluntary deposits).

For the purpose of this questionnaire, municipal waste refers to:

—all waste generated by households, regardless of the way it is collected, and

—commercial waste defined as above, only if collected by or on behalf of municipalities.

The definition excludes:

—waste from municipal sewage network and treatment;

— construction and demolition waste[18] from the municipality itself.

III. Selective Collection Rate

Definition:

Selective collection = what is selectively collected by the municipality either for material recycling and composting (including AD but not MBT)

Note: **mixed waste sent to MBT plant cannot be considered** as selectively collected.

Calculation methodology:

$$\frac{\text{Amount of municipal waste collected selectively (kg)}}{\text{Total amount of municipal waste generated (kg)}} \times 100$$

The following waste streams should be taken into consideration:

Waste streams
Paper & Cardboard (packaging/non packaging)
Metal (packaging/non packaging)
Glass (packaging/non packaging)
Plastic (packaging/non packaging)
Beverage Cartons
Other (plastic metal cardboard) packaging
Green waste
Kitchen waste

[18] Construction & Demolition Waste (C&D): The Eurostat definition of MSW excludes "municipal construction and demolition waste" but, on the other hand, the Waste Framework Directive" defines goals for C&D waste recycling (70%) and, "the use of C&D waste in road construction is considered as recycling".

Therefore C&D waste is considered in recycling rates calculations but is excluded, in the first instance, as a MSW stream.

Construction & Demolition Waste(C&D)* – should be excluded from our definition of MSW, however inert waste could be included (metal, plastics etc.).

WEEE
Bulky Waste
Textiles
Used Cooking Oil

When calculating the selective collection: **street cleansing should not be considered.**

As when calculating the amount of municipal waste, Construction & Demolition waste and Hazardous waste are also excluded.

Conclusion: only include collection of separate materials with the purpose of material recycling. **No residual waste should be considered when calculating the selective collection rate (%).**

IV. *Recycling Rate*

Definition:

Recycling (sent to recycling) = selectively collected materials (from source collection and CA sites) minus contamination reject from sorting operations plus recuperated materials from MBT (and metals from incineration)

Calculation methodology:

$$\frac{\text{Amount of municipal waste selectively collected (kg)}}{\text{Total amount of municipal waste generated (kg)}} \times 100 \quad + \text{ recovered materials from MBT} \quad - \text{ Contamination rejected waste}$$

When calculating the overall recycling rates, the following treatment methodologies were considered:

- Mechanical recycling

- Composting
- Anaerobic Digestion
- Mechanical Biological Treatment (MBT), but only the output material

Note: When calculating the recycling rate it is important to note that in some cases it is not very clear how much of the amount of waste selectively collected for recycling is actually recycled. Some municipalities do not hold the exact data of the waste that is actually recycled but will provide data of the waste that is selectively collected at source. In some other cases the amount actually recycled will be provided by the waste management company or the recycling company.

Numerator / Denominator:

In the absence of a standard protocol framing the methodology for calculating the recycling rate outside the contents of the European Commission Decision, it is difficult to access detailed information explaining how member states and respectively regional/ local authorities make their calculations.

When calculating the recycling rate , the numerator relates to the amount of waste 'actually' recycled' but as we will see later in the report some regional/local authorities do not know the amount of waste actually recycled but can only provide data of the amount of waste selectively collected for recycling. Also, due to some level of contamination, the output from a selective collection scheme never equals the volume of material received at the recycling sorting centre. Therefore, the numerator might not reflect the actual definition given by the EC.

When calculating the recycling rate, the denominator reflects the quantities put on the market however it is not always clear and transparent the actual amount of recyclables put on the market. When calculating the denominator, imports and exports might be included or not, however according to Eurostat[19] exports should be included in the calculations for municipal waste but imports should not be considered.

V. *Civic Amenity Centres (CA sites)*

[19] Eurostat Workshop: 'How to improve reporting on Municipal Waste?', 7th-8th February 2012

In order to measure the effectiveness of the Civic Amenity Centres, 2 indicators to be taken into account:

- Number of inhabitants per civic amenity centres (CA sites) or per territory surface.
- Number of visitors divided by the potential capacity of the Centre.

VI. *Door-to-door*

- When referring to door-to-door is the **kerbside collection of individual household** or individual business waste containers. Collection is considered door to door when the sacks/containers are stored in private premises and picked up in front of every house/building.

- Street containers are considered as **bring banks** (brink centres).

VII. *Bulky Waste*

Bulky waste is a very complex waste stream (category). Only the part of Bulky waste (intended as pieces of furniture, chairs, mattresses, from households, offices and civic amenity sites) that is actually sent to recycling can be accounted in the recycling rate, the other part that goes to incineration or landfill is considered as residual waste.

Where the separation cannot be done then it should be classified as 'mixed bulky waste' (meaning that it might not only contain items sent for recycling but only non-recyclable material).
Bulky waste (sent to the transfer stations or sorting centres) to be classified in the data matrix as:

-sorted bulky waste: furniture or toys collected door-to-door or from a specific collection point in the municipality;

-unsorted bulky waste: bulky waste from illegal dumping or street cleansing;
An additional point mentioned (but not concluded), was to look at the origins of bulky waste, i.e.:
bulky waste originating from: door-to-door, CA site, street cleansing.

VIII. *Residual Waste*

Composition analyses of the residual waste are very interesting. It enable us to calculate the amount of waste that might be recycled if it would be collected selectively (= the **recycling potential**).
LIPOR (Porto) and IBGE (Brussels) – can share their waste composition analysis with other participants in order to improve the waste data collection methodology.

Where a waste composition analysis for a specific region or local is not available, then the national waste composition analysis can be used for all waste flows or specific ones. Waste composition analysis should not be later than 3-4 years old.

Also residual waste includes so many different materials: therefore when benchmarking we need to break down the various items (dry materials, street bins, street cleansing waste, bulky waste, etc.) in order to compare the same types of waste flows.

Street Cleansing:
When calculating the total street cleansing waste – need to consider:
- bulky waste (unsorted)
- Illegal dumping
- Street bins/ containers

As a general rule we should follow the definitions and guidelines of Eurostat and make exceptions only when necessary.

8. Conclusion

A positive process
From the exchanges and work made by cities and regions taking part to the ACR+ Observatory we can conclude that the exercise of collecting and comparing data at local and regional level following the same methodology and in working groups has proved to be interesting and promising, even if it brings lots of questions and we observed some limitations (but it is also why the work of the ACR+ Observatory is so important). Therefore, it is proposed to continue investigate waste data

comparison on several issues of interest for ACR+ members, in particular with regards to reporting obligations and the revision of EU waste targets in 2014.

Synergy and extension

In order to ensure consistency and real comparison between cities and regions, some recommendations for data collection and comparison were made (see previous chapter). These recommendations are in line with the methodology followed by the Regions for Recycling project (R4R project, 2012-2014 - www.regions4recycling.eu), a European project gathering several ACR+ members part of the ACR+ Observatory and other cities and regions. The R4R project has been developed as a complement to the ACR+ Observatory work and aims at identifying good practices and developing tools to help cities and regions improve their waste recycling performances. Clear synergy between the two initiatives should be maintained, so that both mutually enrich themselves. In particular, the R4R project gives the opportunity to compare data with other cities and regions and to benefit from a webtool currently being developed within R4R on waste monitoring that should help public authorities regarding data collection and benchmarking. On the other hand, the ACR+ Observatory gives the opportunity to dig deeper on certain issues, to involve other stakeholders and to continue its activities in the long term.

Recycling vs selective collection in the view of recycling

It has already been mentioned that cities and regions don't always have a clear view on waste recycling, since once collected waste goes to other operators: some municipalities provide data of the waste that is selectively collected at source and in other cases the waste management company or the recycling company will provide the data. Therefore, it might be easier for cities and regions to use another data than recycling when reporting to fulfill national or European obligations. If the public authority at local or regional level has information about the amount of waste selectively collected that is rejected from recycling and if this amount remains reasonable, we suggest using 'selective collection in the view of recycling' rate instead of 'recycling' rate to report and compare data. This would mean:

- To get data about rejection rate from recycling facilities.
- To define more precisely what is meant by 'reasonable amount of rejection' (less than 10%?)

Another solution to get information on recycling would be to impose waste management/recycling companies a reporting obligation in their contract.

Next issues for the ACR+ Observatory

ACR+ proposes to continue the work of the Observatory on several topics of interest for cities and regions and to hold meetings and workshops on the followings:

- In order to follow-up the evolution of performances, waste data could be collected for 2010 and 2011, using the methodology approved in the first phase of the ACR+ Observatory and, when available, the R4R tools (a beta version should be available for testing by the end of the year and a specific training on how this tool works could be envisaged).
- Considering the uncertainties remaining on municipal waste and in particular the fact that it is sometimes not clear when commercial waste is included in the total and how to assess it more precisely, it is proposed to create a specific working group in charge of analyzing more precisely the difficulties to collect separate data on household waste / commercial waste and how to overcome these difficulties.
- Considering that EU legislation set specific targets for packaging when there is no harmonization between local/national/European data collection (also from material federations perspective), it is proposed to create another working group in charge of analyzing waste data collection for the main material fractions: glass, paper, metals, plastics in collaboration with the corresponding European waste stream federations. ACR+ Secretariat already started to work on glass on the basis of 2009 data provided by ACR+ Observatory members during the first phase.

Further discussion about these issues could be at the agenda of the next ACR+ Observatory meeting, as a side event of the R4R mid-term conference in Odense on 15 May 2013.

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