

Paper and Board
Collection, Recycling,
and Recovery

12th Report

2006

July 2007



Comieco

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Contents

Preface	5
Claudio Romiti Chairman of Comieco	
Introduction	7
Carlo Montalbetti General Manager of Comieco	
<ol style="list-style-type: none"> 1. Separate collection in Italy: a steady growth 2. The input of Comieco: more agreements enhance collection 3. Mentions of honour 4. The Southern issue between emergency and development 5. Home selection and the role of households 6. Italy vs. Europe 7. The role of Comieco in the CONAI system 8. Financial resources to support separate waste collection 9. The environmental value of separate paper and board collection in Italy 10. Separate paper and board collection improves the quality of the territory 11. The national recycling network 	
Charts and Tables	11
Note on the method	40
Cost-benefit analysis of separate paper and board collection in Italy	42
(updated at 31.12.2005)	

In 2006 Comieco provided

83 million EUR

funds to the Italian Cities



Preface

While this Report on Paper and Board Collection and Recycling is being completed, the waste management emergency in the Campania region is still running on national newspapers.

Facing such a challenge and discomfort, which even resulted into a call from Giorgio Napolitano, President of the Italian Republic, the paper I am introducing with these few lines could look like a mere statistical exercise. On the other hand, I think that the data and the development of separate paper and board collection in our Country can actually promote hints, lessons, and the belief that the Campania emergency can be soon overcome.

Packaging and paper account for a significant share of urban waste; the data contained in the 12th Report shows that separate collection and subsequent recycling are the main management methods. In this respect, in a comparison against major European countries, Italy ranks second after Germany in terms of paper and board recycling, also thanks to a number of national champions that stand out among their European peers.

With specific reference to paper and board packaging recycling – the Comieco Consortium's own mission – the sum of the quantities originating from urban separate collection and from paper recovery from industries and trade performed by private entities confirms a 66% recycling rate for 2006 – higher than the EU target.

Recycling is ensured both through the national paper industry (5.6 million tons) and through exports, totalling approximately 900 thousand tons. If imports of types not available on the domestic market are also considered, the net export balance is positive for more than 400 thousand tons. In other words, separate paper collection covers the domestic raw material needs, and has also resulted into the birth of a new economic sector focused on the needs of Europe and of the new emerging economies – first and foremost China.

Again with reference to urban separate collection, in 2006 a total of more than 2.5 million tons of collected waste were separated, and 175 thousand tons were newly collected. Comieco played a significant role, with a 131 thousand ton growth of managed collection in 2006. Of all the paper and board collected separately by the Italian Cities, about 74%, or 1.88 million tons, was managed by Comieco. The economic flow triggered by the separate paper and board packaging collection service performed under agreements

between the Cities and the operators amounted to almost 83 million EUR.

This year's Report is integrated with an updated calculation of the overall economic and environmental benefit achieved by the Country through separate paper and board collection, which exceeded 1 billion EUR in the 1999-2005 period.

But what about the South in 2006? Separate collection grew by 14.7% to more than 400 thousand tons. In absolute terms, more than 50 thousand tons originated mostly from household collection. And this collection is the main focus of Comieco's commitment, in that it shows its highest potential in the South (the yield per inhabitant in the South is still less than half of the national average yield). In this context, the significant improvement of Sardinia is worth mentioning, in that it demonstrates that the gap with the rest of the country can be quickly filled also without emergency management.

In summary, the 12th Report shows that separate paper and board collection is by now a more and more important and consolidated fact, with over 2.5 million tons collected equal to 30% of overall separate collection, and constitutes a crucial component of the domestic recycling industry, providing a positive input to foreign trade.

Almost 50 million Italians take profit from the guarantee of recycling offered by Comieco and from the returns of the ANCI-CONAI Agreement. In the South, wherever the local institutions and operators provide an appropriate and ongoing collection service to citizens and companies, collection grows significantly, not only in percent terms. The achieved and by now consolidated results show that separate paper and board packaging collection is an accessible solution for the South to bring about a change also in the regions under emergency. The non-performance of separate collection does not allow to recycle, and entails a high cost for the community.¹

Comieco – the Consortium I represent – is committed to help and support the local institutions, the entities in charge of emergency management, the citizens, and the companies in order to allow the prompt implementation of separate paper and board collection, promoting the recycling of materials that today are, unduly, still part of the problem.

Claudio Romiti

Chairman, Comieco

¹ A study requested by Comieco estimated that the cost for missing the national separate paper and board collection average target in Campania in the 1999-2005 period amounted to 100 million EUR.

A close-up photograph showing a metal blade cutting through a piece of corrugated cardboard. The blade is positioned diagonally from the top right towards the bottom left. The cardboard's internal fluted structure is exposed and frayed at the cut edge. The background is a blurred, light-colored surface.

**Paper and board collection
increased by**

7.4%

in 2006

Introduction

This Report contains 11 highlights, describing separate paper and board collection in Italy. Each of the following sections provides the numbers and trends of our country, which progressed enormously towards the habit of separating paper and board products for recycling. Going through these 11 indicators means acknowledging the minor behavioural revolution of the Cities that – unfortunately not everywhere – took steps 10 years ago with the Ronchi decree and with the setting up of the CONAI system.

1. Separate waste collection in Italy: a steady growth

Separate paper and board collection in Italy keeps growing. Comieco estimates that in 2006 a total of 2.5 million tons were collected, with an increase of about 175 thousand tons (+7.4%). Separate collection grew by 6.7% in the North, 4.7% in the Centre, and 14.7% in the South, but in absolute terms this means that the southern regions collect just more than two-thirds of the quantities collected by those in the Centre, with half of the inhabitants, and still have to work hard to fill the gap with the results of the northern ones.

Data shows that, despite significant improvements in certain regions, including Sardinia that recorded an 84% growth in one year, other regions, like Sicily, have seen a sudden reduction of the quantity of paper and board collected separately, after two-digit increases in the 2003-2005 period, because the limited operational scope of the ATOs (Ambiti Territoriali Ottimali, Optimal Territorial Circuits) actually “clogged” the system. In 2006, Molise grew by as much as 97% vs. 2005, but its paper and board collection barely started from 1,962 tons.

In this context, the paper and board recycling and recovery target for energy production is not yet achieved, and according to estimates, about 15% of apparent consumption quantities at a national level still end up in landfills.

Comieco expects a further 7% growth of national separate collection for 2007, mostly due to the results that will be achieved thanks to service improvement in the Centre and South.

2. The input of Comieco: more agreements enhance collection

The number of agreements with the local institutions grew from 329 executed all over Italy in 2001 to 616 in 2006. In 2006, the collection managed by the Consortium under agreements grew by 7.5% to 1.88 million tons, i.e. 74% of the total. In addition to the agreements, the Consortium promotes communication projects and initiatives with the local institutions to sup-

port separate collection, including the protocol signed with the Puglia Region. Through co-operation between the Consortium and the region, collection increased by 14.5% in Puglia in 2006 – representing one of the best achievements in Italy.

3. Mentions of honour

In this positive scenario, the per-capita collected quantity also increased in Italy (+6.1%) to 38.1 kg: it is higher in the North, especially in Trentino, where it is close to 73 kg per capita, and in Vallée d'Aoste (66.5 kg), but some growth is also recorded in Piedmont, Lombardy, and Friuli-Venezia Giulia. The performance of Sardinia is worth stressing: the region is, in fact, quickly filling the gap with the national collected average.

In the main capitals of provinces, total separate collection grew by 20.2% on average (+14.2% for paper and board collection under agreements).

In the sample cities, a growing trend of per-capita separate collection is recorded: 87.5 kg in Florence and a record 32.5% growth in Bari compared to 2005, with 68.2 kg per capita. The result of Bari is highly significant because it is twice as high as the national average.

Interesting data concerns the 2006 collection trends in large metropolitan areas: Milan, for example, stands out for a sharp decrease of the quantity of urban waste not collected separately (-34,466 tons) vs. an increase of separate collection (55,374 tons).

4. The Southern issue between emergency and development

The South is where separate collection growth is quicker today (+14.7% vs. the previous year), but still too slow with respect to the need to fill the gap with the other two Italian macro-areas.

Separate collection performed under agreements is growing in the South (+16.1%), and so is the per-capita collected quantity (+13.5%).

The incidence of collection performed under agreements on the total, in the southern regions, is highest, and the growth rate of mixed paper board sc collection is also very high. The share of selective collection in the South, however, still amounts to 57.1% of the quantities collected under agreements, vs. a 39% national average.

Local management problems hampering the activity are still to be solved. In Sicily, the ATOs that can hardly come into force, and in Campania – where separate collection in 2007 is increasing by 25% - the persistent emergency prevented so far from filling the gap between the North and the South.

Introduction

5. Home selection and the role of households

Separate collection performed by the households in Italy is increasing from 59.6% to 61% of the total. This is a very positive sign, which points out to a more dynamic home selection activity.

The total paper and board collection, in fact, includes two items: "joint" collection represented by newspapers and weekly magazines, as well as packaging board, and "selective" collection, which only concerns board packaging originating from business use.

Data shows that "joint" collection is significantly increasing because the service has been enhanced. In addition to an increased involvement of households, the quality of the collected paper and board fraction is improving, with a current 3.3% rate of foreign materials in "joint" collection and 1.2% in selective collection.

6. Italy vs. Europe

A comparison of big European sample cities shows a positive performance of the two main Italian towns – Rome and Milan – which proves that our system is one of the best in the continent. Milan ranks second after Vienna by per-capita paper and board collection, but first in terms of separately collected share of the total collected waste. With respect to European industrial districts, the Tuscan one, made up of four cities in the Florence neighbourhood, ranks first with a 98.7 kg yield per inhabitant and a 38% separately collected share of the total collected waste.

In Europe, the city of Prato ranks first by separate paper and board collection yield, equal to 184.3 kg per inhabitant.

7. The role of Comieco in the CONAI system

In order to allow to achieve the 2008 targets and to meet the commitments undertaken with the parties to the ANCI-CONAI Agreement, in July 2006 the Board of Directors of CONAI approved an increase of the CONAI fee for paper from 15.49 EUR per ton to 30.00 EUR per ton as of January 1, 2007.

From 1998 to 2006 Comieco committed a total of 427 million EUR in Italy. In the same period, 14.7 million tons of paper and board were collected separately and recycled, thus avoiding the building of 120 new landfills.

In 2006, paper packaging accounted for 36% of total apparent consumption, equal to 26.1% of the collected CONAI Environmental Contribution; the results achieved by recycling (66.6%) showed the highest performance of all materials, both in weight and in percent value, and

allowed the system to exceed the global 55% recycling rate provided for by the European Directive.

8. Financial resources to support separate collection

The economic support of Comieco to separate paper and board collection keeps increasing. In 2006 it was close to a total of 83 million EUR, 11.2% more than in the previous year. In terms of contribution per inhabitant under agreements, the average domestic expense amounts to 1.68 EUR: 2.07 in the North, 1.96 in the Centre, and 1.08 in the South due to lower collection yields per inhabitant. Economic support to the system by paper mills also increased by 24%: in 2006 they contributed with a total of 3.5 million EUR.

9. The environmental value of separate paper and board collection in Italy

The increase of the environmental value of separate collection can be measured in terms of natural resource saving and reduction of emissions into the atmosphere. If only the energy consumption of the whole paper production cycle is considered, the use of recovered paper as a raw material is largely favoured. In terms of the input of separate paper and board collection to the reduction of polluting emissions into the atmosphere, the ecological balance of the operation is by far positive. With a consumption of 32 kg equivalent of carbon dioxide per ton of collected and sorted paper, 210 kg are saved in the recycling phase and 1,130 following non-disposal. This means that in 2006, by recycling the recovered paper obtained from separate collection, 3 million tons of greenhouse gas emissions were avoided, equal to 6 days and 6 nights of full traffic block.

10. Separate paper and board collection improves the quality of the territory

Comieco sees separate collection as a way to improve the quality of the territory where it takes place, because it is an important tool to protect the environment and ensure a sustainable use of resources.

Separate collection, in fact, reduces the need to use other forms of disposal, such as landfills, which deplete the soil and devastate the landscape. The awareness of separate collection and recycling issues is increasing in the national public opinion, which considers this service as an added value in the competition among tourist regions, many of which fall within protected areas. In spite of the logistic challenges due to the small size of towns and to the orography of Protected Areas, there are some cases of excellence that place, for example, the cities

Introduction

of the Venosta Valley, in the Stelvio Park, at the top of the collection ranking with as much as 72 kg per capita – about twice as much as the national average. This figure is particularly encouraging, because 85% of the collection performed by the Mountain Community concerns people that dwell within the park. The City of Sulmona also deserves mentioning, with its 30 kg per inhabitant (vs. a regional average of 26.2 kg) and a service aimed at households only. A definitely positive result was achieved by the protected sea park of Punta Campanella, which comprises the Cities of Sorrento and Piana di Sorrento, where separate collection amounts to 37 kg per inhabitant, vs. a regional average of 18.7 kg and an average of 20.9 kg for the South.

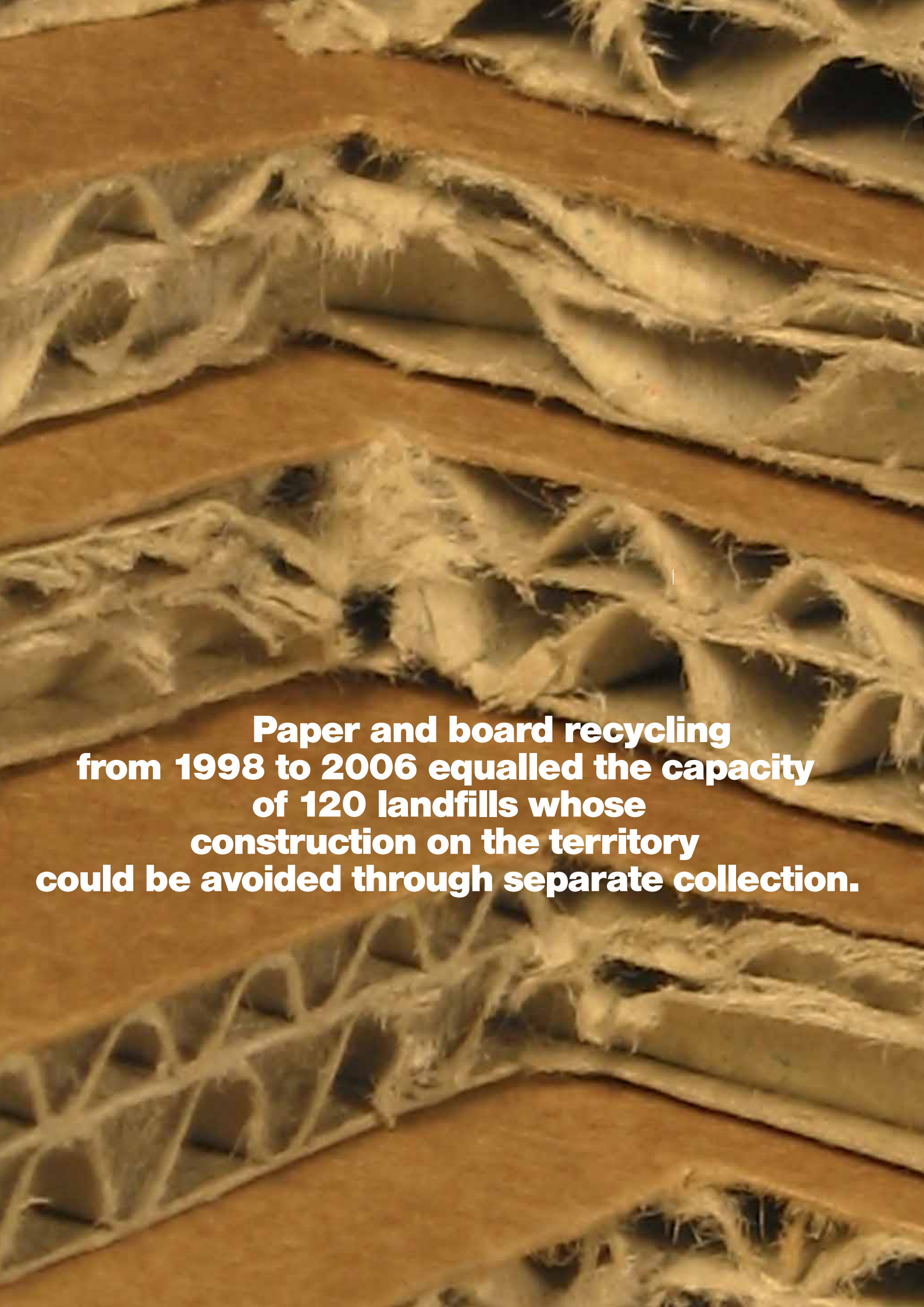
11. The national recycling network

The recycling of separately collected paper and board is ensured by a network of 321

sorting plants and 68 paper mills, which cover the whole national territory. Comieco carefully monitors the quality of the collected material. In 2006, a total of 1,551 analyses of recovered paper obtained from joint and selective separate collection performed under agreements were executed. The impact of this quality control activity resulted into increased efficiency for the whole system. Based on these results, the Consortium entered into an agreement with Unionmaceri to obtain, by 2008, the certification of the sorting plants. At present, 38% of these are already ISO 9001 certified (Quality System Certification), 29% are ISO 14001 certified (Environmental Certification), and 2% have obtained an EMAS registration.

Carlo Montalbetti

General Manager, Comieco



**Paper and board recycling
from 1998 to 2006 equalled the capacity
of 120 landfills whose
construction on the territory
could be avoided through separate collection.**

Charts and Tables

Year 2006 Overall data

City	TOT undifferentiated UW	TOT SC	TOT UW	TOT SC/TOT UW	Paper and board SC under agreement	Separate paper and board collection under agreements/TOT SC
	t	t	t	%	t	%
Milan	439,930	290,860	730,790	39.8	89,737	30.9
Turin	347,280	208,072	555,352	37.5	58,854	28.3
Florence	182,880	81,332	264,212	30.8	31,145	38.3
Rome	1,488,835	340,625	1,829,460	18.6	99,011	29.1
Naples	526,975	61,937	588,911	10.5	20,707	33.4
TOTAL	2,985,900	982,826	3,968,725		AVERAGE	32.0

2005-2006 variations

City	TOT undifferentiated UW	TOT SC	TOT UW	Separate paper and board collection under agreements
	%	%	%	%
Milan	-7.3	23.5	2.9	20.0
Turin	1.3	54.7	16.3	33.0
Florence	0.1	4.0	1.3	2.7
Rome	0.8	3.2	1.3	2.0
Naples	0.6	15.7	2.0	13.4
AVERAGE	-0.9	20.2	4.8	14.2

Table 1
Urban waste management in the cities of Florence, Milan, Naples, Rome, and Turin.

(Source: Comieco)

Per-capita year 2006

City	Inhabitants	TOT undifferentiated UW	TOT SC	TOT UW	Separate paper and board collection under agreements
	n	kg/inh.	kg/inh.	kg/inh.	kg/inh.
Milan	1,256,211	350.2	231.5	581.7	71.4
Turin	865,263	401.4	240.5	641.8	68.0
Florence	356,118	513.5	228.4	741.9	87.5
Rome	2,546,804	584.6	133.7	718.3	38.9
Naples	1,004,500	524.6	61.7	586.3	20.6

Milan, the leader of metropolitan areas

Data on separate collection trends in the five main metropolitan areas shows that Milan brought the lowest quantity of waste to landfills in 2006, recording a **7.3%** reduction.

Acronyms

SPF similar product fractions
(non-packaging paper and board)

SC separate collection

UW urban waste

% percent

n number

t tons

inh inhabitants

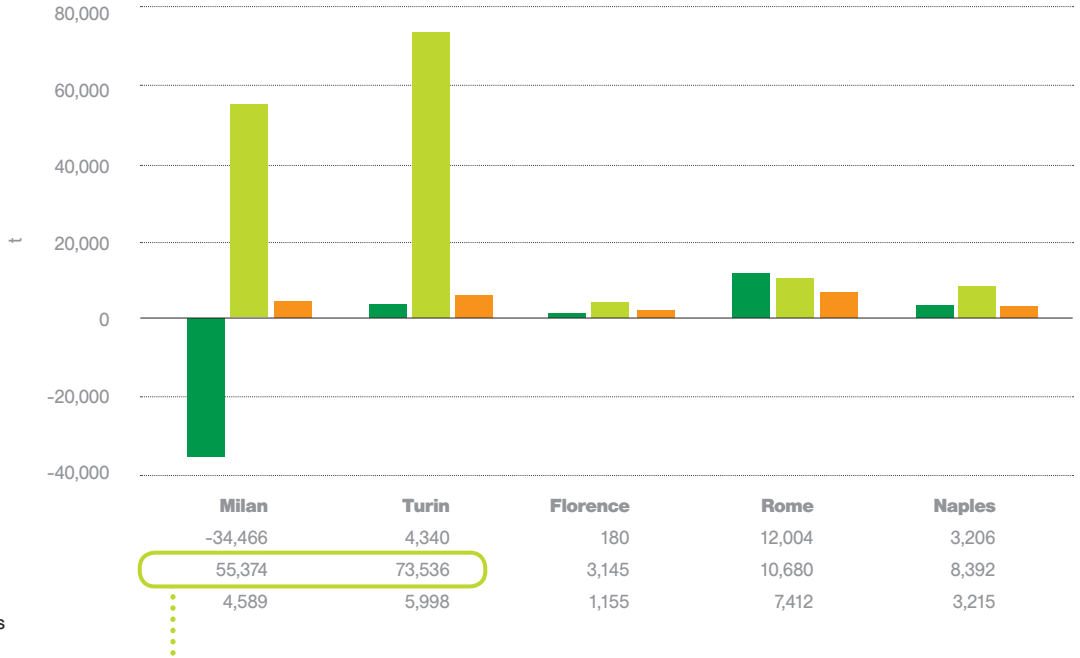
kg kilograms

Charts and Tables

Absolute annual variation 2005-2006

Figure 1
Urban waste management in the cities of Florence, Milan, Naples, Rome, and Turin 2005-2006 variation.

(Source: Comieco)

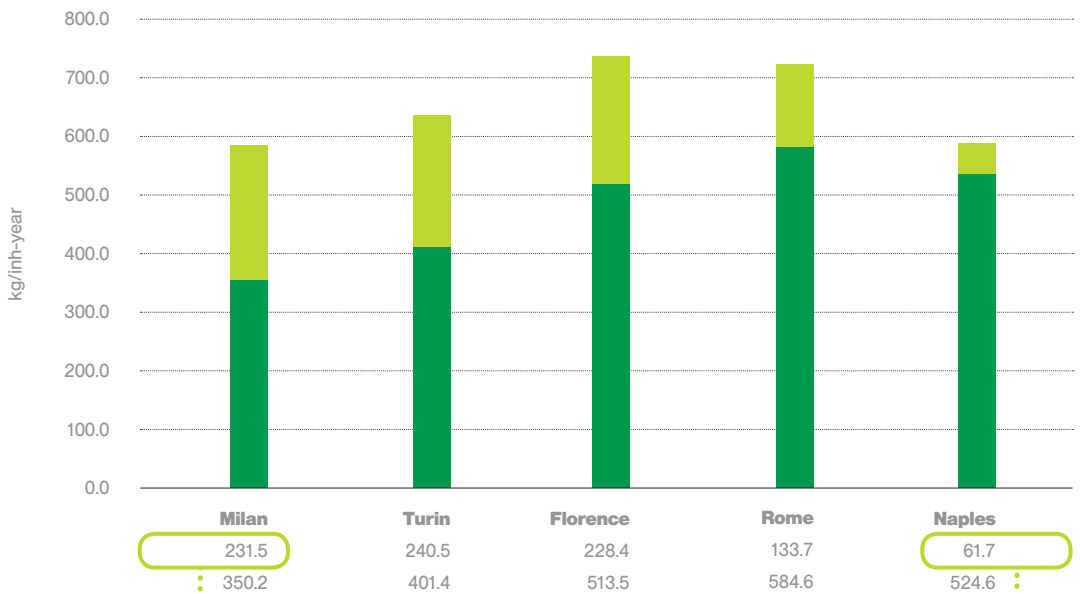


In absolute values, **Turin** is where the growth of the separate collection rate was highest (+73,536 t) in 2006, followed by **Milan** with +55,374 t.

Per-capita production – 2006

Figure 2
Urban waste management in the cities of Florence, Milan, Naples, Rome, and Turin. Per-capita 2006.

(Source: Comieco)



While the **capital of Lombardy** is the best performer in the sorting of collected waste (231 kg per inhabitant vs. a total of 581.7), **Naples** is the worst performer (61.7 kg per capita vs. a total of 586.3).

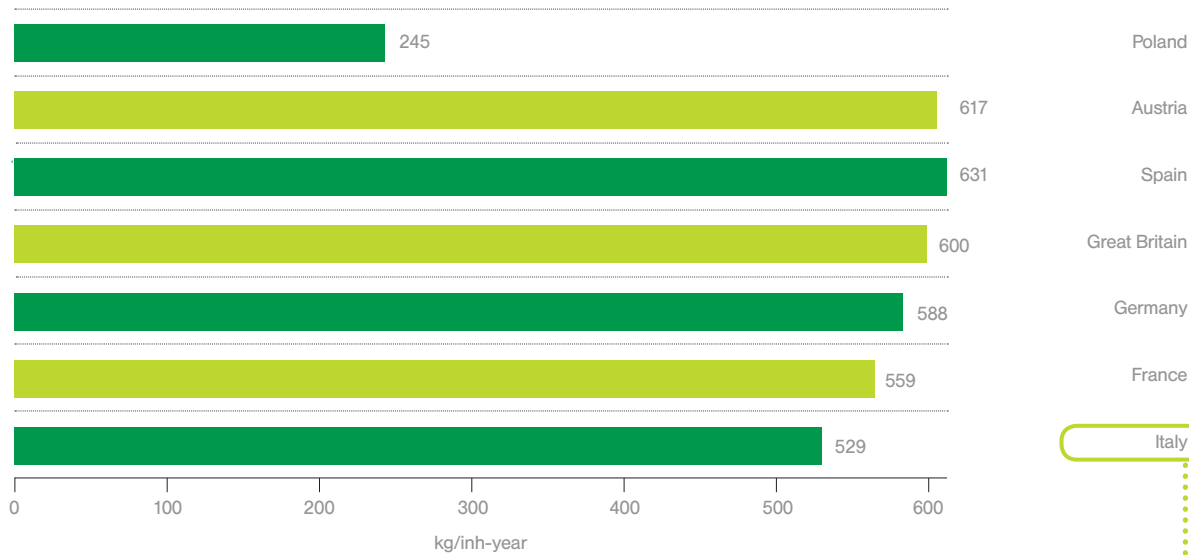
Charts and Tables

Reference year (*2004-**2005)	Italy**	France*	Germany*	Great Britain*	Spain*	Austria*	Poland**
Total production (UW)	t 31,150,000	35,145,000	48,434,000	36,121,000	28,033,000	5,104,000	9,353,600
Per-capita production (UW) kg/inh-year	529	559	588	600	631	617	245
Final UW destination							
Recycling and composting	% 30.0	27.0	57.0	23.0	40.2	62.0	6.7
Energy recovery	% 10.0	31.0	23.0	9.0	8.0	11.0	0.0
Landfill	% 57.0	39.0	17.0	67.0	48.5	27.0	92.5
Other	% 3.0	3.0	3.0	1.0	3.3	0.0	0.8

Figure 3
Comparison of European countries in terms of urban waste production and management.

(Source: Comieco, Erm)

Per-capita production



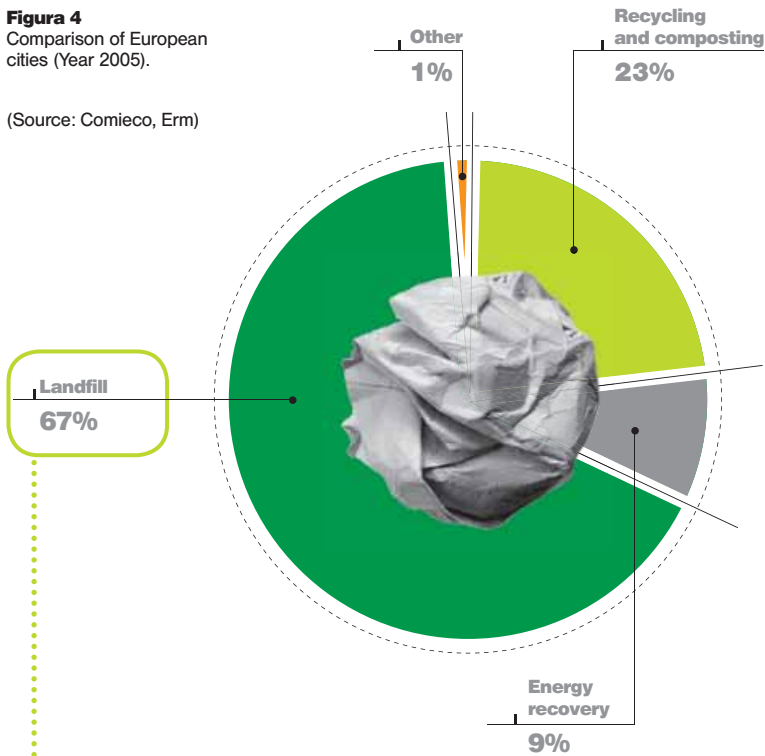
In a comparison against the main European Countries, **Italy produces the lowest quantity of waste per inhabitant** (only higher than Poland whose economy, however, is not comparable to the Italian one): **529 kg vs. 631 in Spain**. As to the recycling of the urban waste produced, Italy **recovers more than France and the UK**.

Charts and Tables

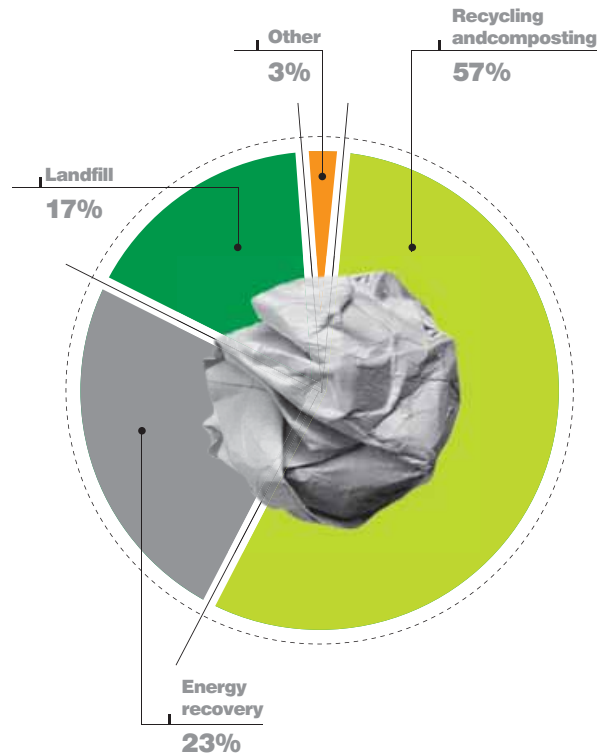
Figura 4
Comparison of European cities (Year 2005).

(Source: Comieco, Erm)

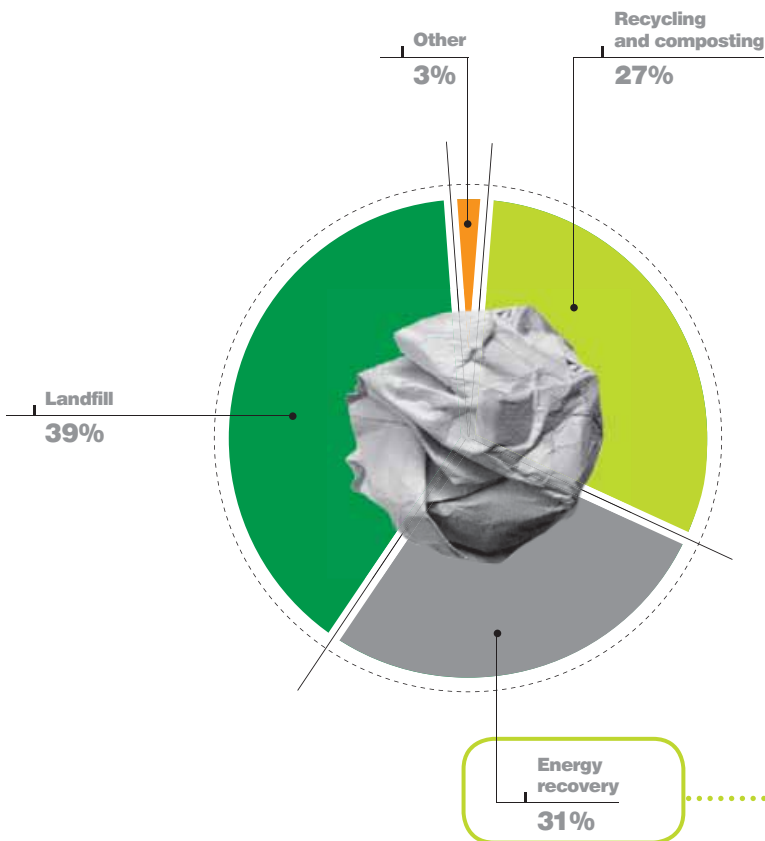
Great Britain



Germany



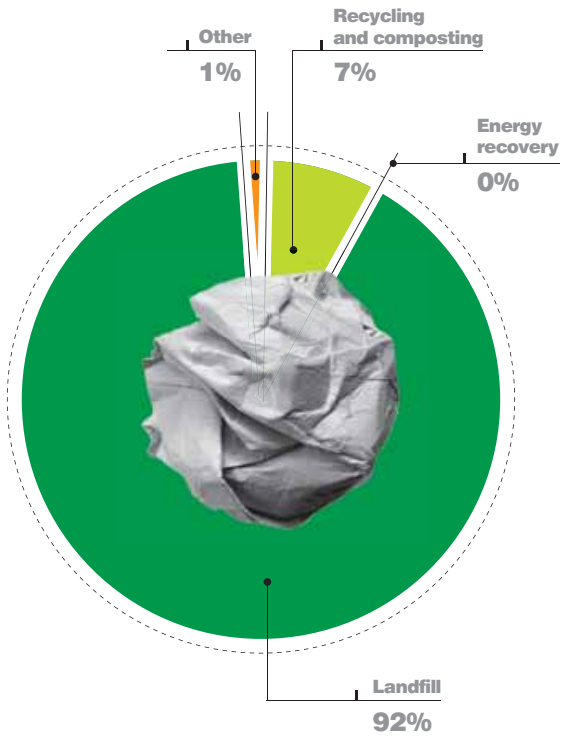
France



The final destination of most (57%) urban waste produced in Italy is still the landfill, but in Europe – except for Poland – the **UK** has the highest landfill disposal rates (67%). **France** ranks first in terms of energy recovery from **UW (31%)**, followed by Germany and Italy.

Charts and Tables

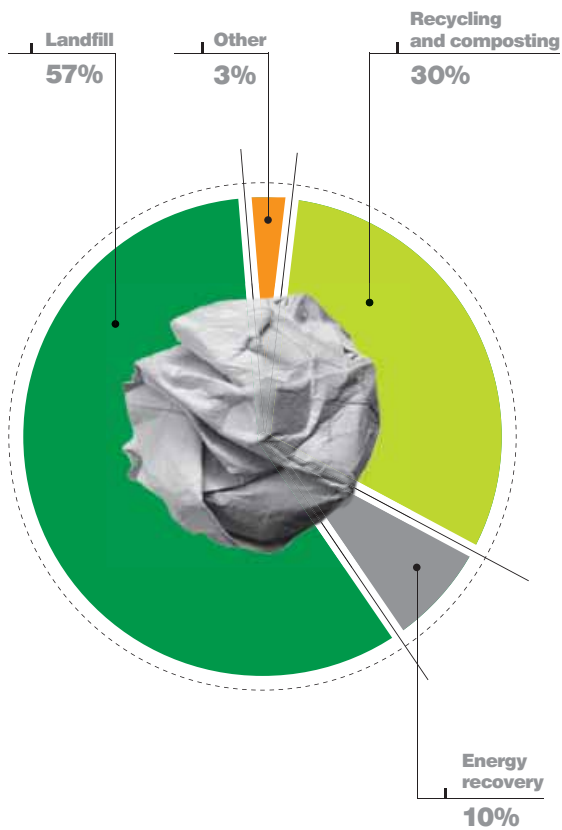
Poland



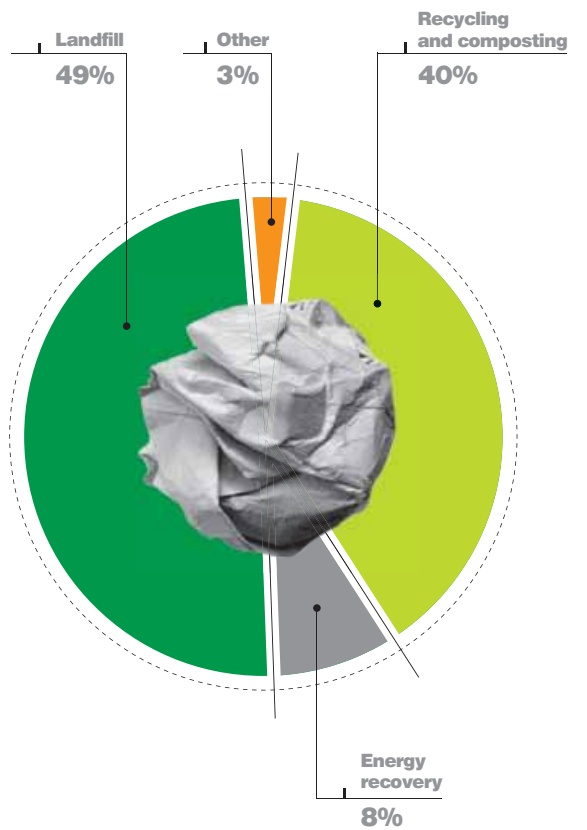
Austria



Italy



Spain



Charts and Tables

Paper collection yield (kg/inh)

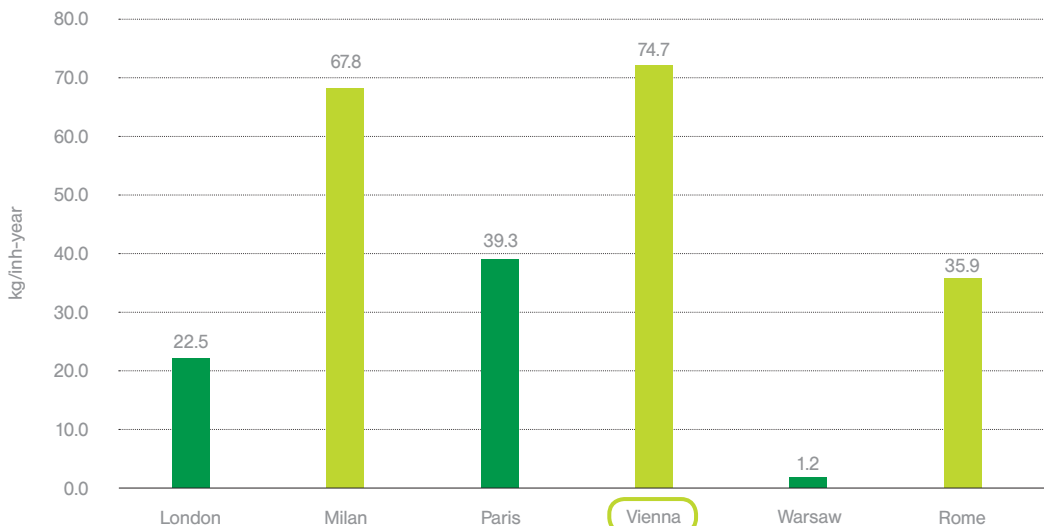


Figure 5
Comparison of European cities (Year 2005).

(Source: Comieco, Erm)

Of all the European cities, **Vienna** recycles the highest quantities of paper and board (**74.7 kg per inhabitant**). **Milan** ranks second with **67.8 kg**, followed by **Paris**, **Rome**, and **London**. It should be noted that, while the French and British capitals have been performing separate collection since the 1980s, Milan only started in 1997.

Paper collection yield (kg/inh)



Figure 6
Comparison of European City districts (Year 2005).

(Source: Comieco, Erm)

The Italian district managed by **Quadrifoglio S.p.A.** (Signa, Calenzano, Campi Bisenzio, Sesto Fiorentino) ranks first among the European city districts in terms of paper and board recovery, with **98.7 kg per capita**, followed by the German district of **Altenkirchen** and the British district of **South Oxford**.

Charts and Tables

Paper collection yield (kg/inh)

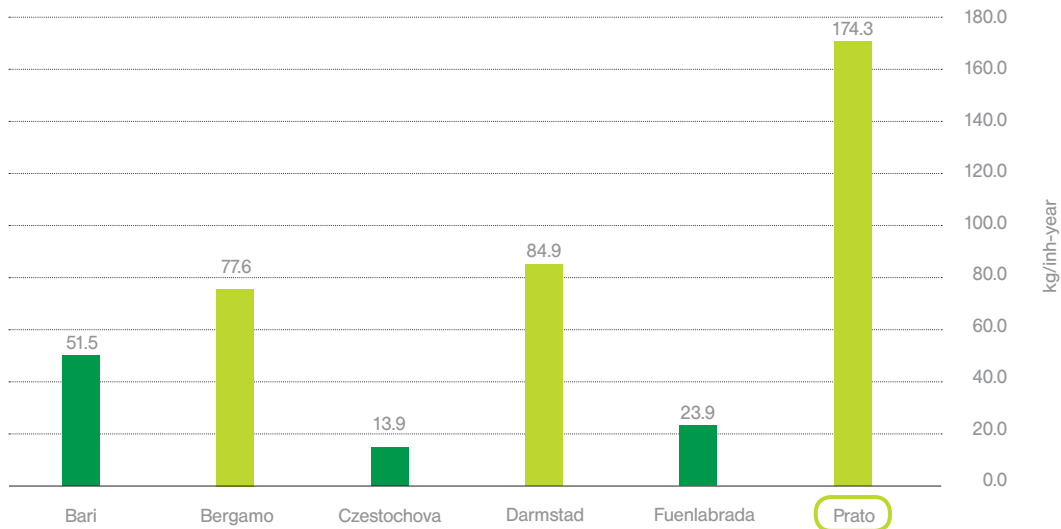


Figure 7
Comparison of European medium-sized cities (Year 2005).

(Source: Comieco, Erm)

In terms of recycling in medium-sized cities too, Italy ranks first thanks to the results achieved by **Prato**, where separate paper and board collection per inhabitant totals **174.3 kg**, twice as high as in Darmstadt, which ranks second followed by Bergamo and Bari.

Paper collection yield (kg/inh)

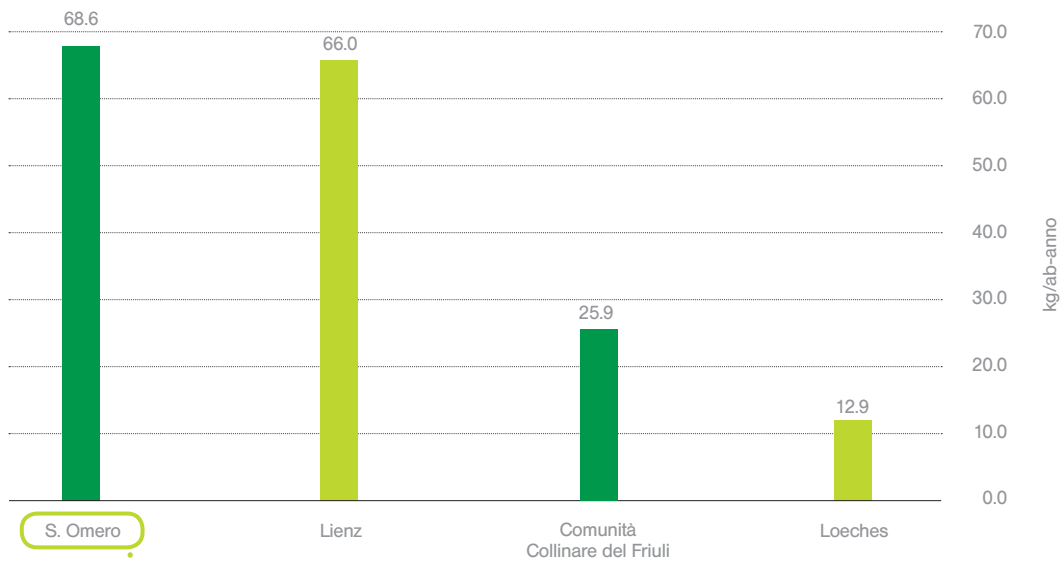


Figure 8
Comparison of European small-sized cities (Year 2005).

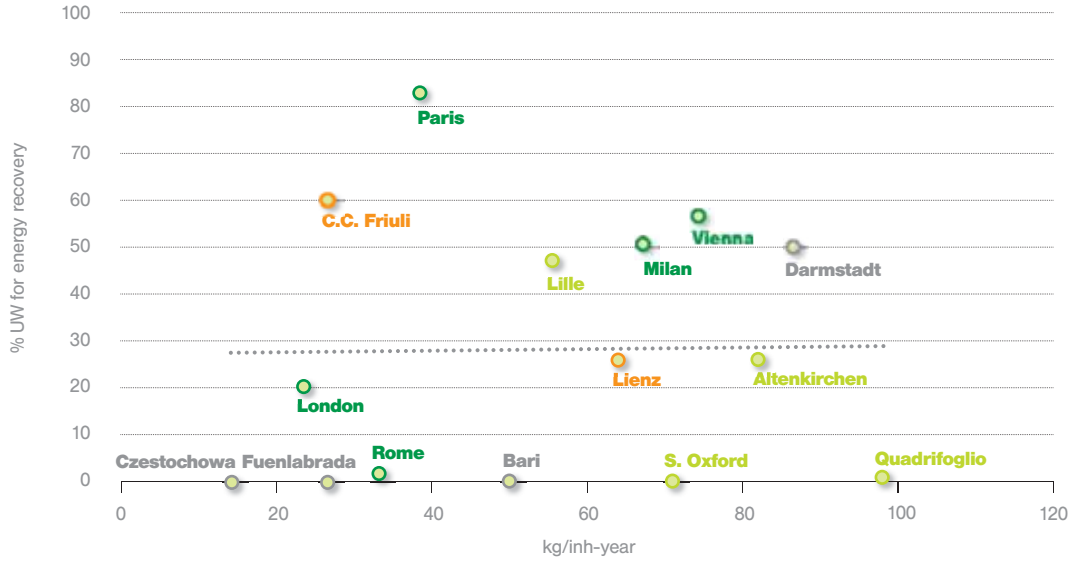
(Source: Comieco, Erm)

In the analysis of small-sized cities, **S. Omero**, Abruzzo, stands out, followed by Linz, Austria.

Charts and Tables

Figure 9
Ratio of collection seniority to results in the analyzed European cases.

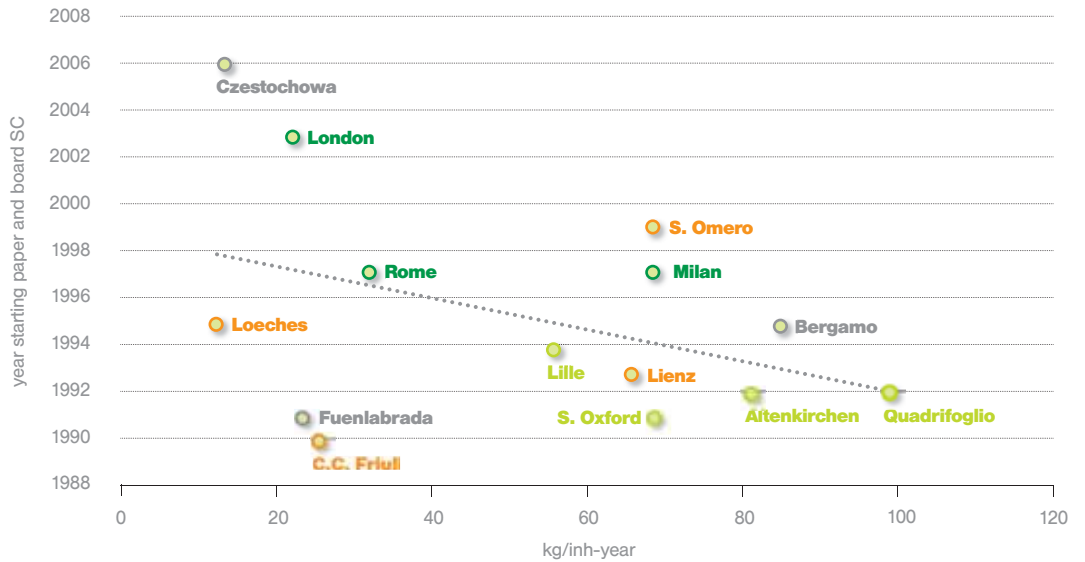
(Sources: Comieco, Erm)



In the analysis of small-sized cities, S. Omero, Abruzzo, stands out, followed by Linz, Austria.

Figure 10
Correlation of collection results with the urban waste management system.

(Source: Comieco, Erm)



The European sample shows a positive correlation between the collection yield and the service seniority.

Charts and Tables

Region	2005 t	2006 t	Δ 2005-2006 %	Δ 2005-2006 t
NORTH				
Emilia Romagna	234,752.7	249,210.7	6.2	14,458.0
Friuli Venezia Giulia	51,348.1	64,531.3	25.7	13,183.3
Liguria	61,945.0	66,566.7	7.5	4,621.6
Lombardia	488,688.4	518,524.5	6.1	29,836.1
Piemonte	284,076.0	302,188.0	6.4	18,112.0
Trentino Alto Adige	67,131.5	69,269.9	3.2	2,138.5
Valle d'Aosta	6,718.0	7,855.5	16.9	1,137.5
Veneto	232,967.3	244,496.1	4.9	11,528.8
	1,427,626.9	1,522,642.7	6.7	95,015.8
CENTRE				
Lazio	208,267.9	212,480.8	2.0	4,212.9
Marche	51,239.9	58,640.7	14.4	7,400.7
Toscana	273,326.8	286,787.6	4.9	13,460.8
Umbria	36,937.5	38,663.9	4.7	1,726.4
	569,772.1	596,572.9	4.7	26,800.8
SOUTH				
Abruzzo	31,841.2	32,351.7	1.6	510.5
Basilicata	12,256.8	12,768.6	4.2	511.8
Calabria	34,412.4	37,164.9	8.0	2,752.5
Campania	87,507.6	102,893.1	17.6	15,385.5
Molise	1,962.2	3,880.1	97.7	1,917.9
Puglia	94,241.1	107,894.9	14.5	13,653.8
Sardegna	20,496.3	37,719.9	84.0	17,223.6
Sicilia	77,977.6	78,990.1	1.3	1,012.5
	360,695.2	413,663.4	14.7	52,968.2
ITALY				
	2,358,094.3	2,532,879.0	7.4	174,784.7

Table 2
Trend of total separate paper and board collection by regions. Years 2005-2006.

(Source: Comieco)

In 2006 Molise recorded the highest growth rates of collected paper and board volumes (+97.7%), but this figure is not too significant, because the material collected in 2005 amounted to a mere 1,962 t.

The case of Sardinia is more interesting: here, thanks, among other things, to a policy providing for economic penalties for cities that did not meet the separate collection target in 2005, collected volumes increased by 84% globally in one year to 37,719.9 t.

Charts and Tables

Figure 11
Comparison of paper and board collection by macro-areas.
Years 2005-2006.

(Source: Comieco)

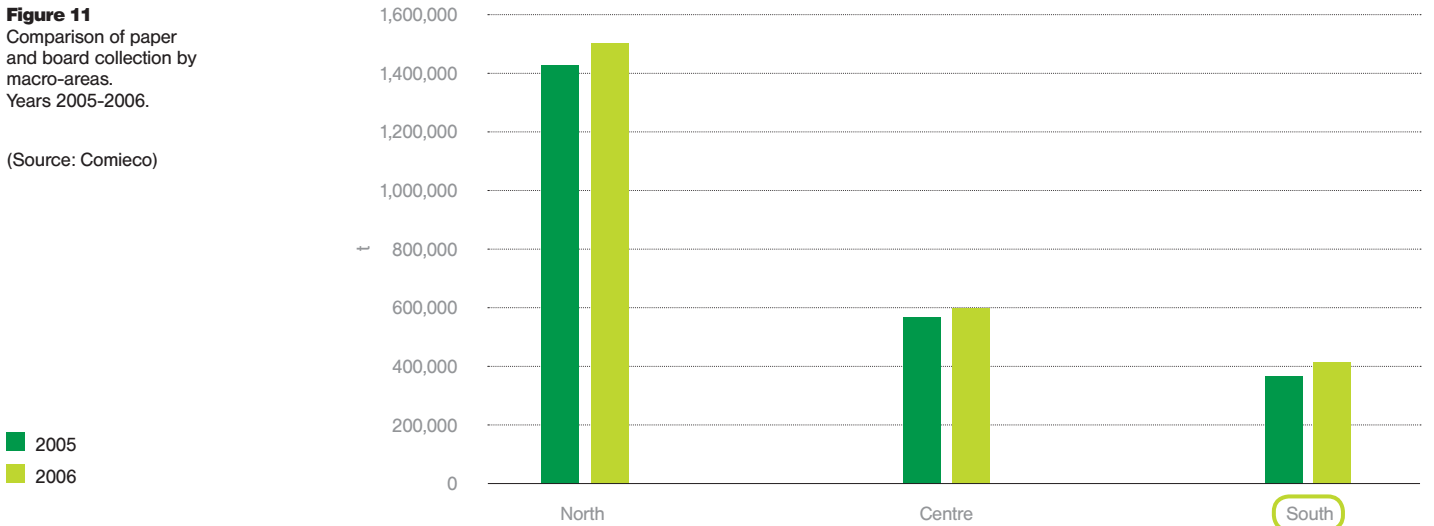
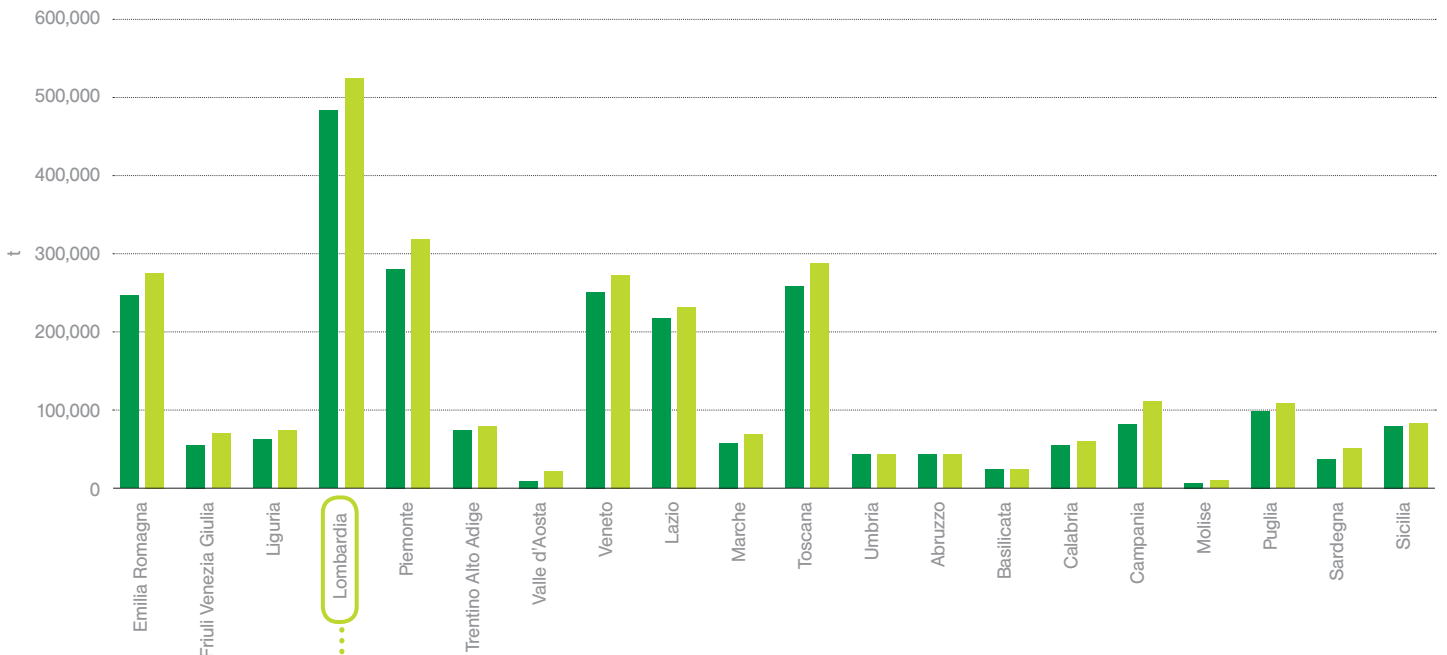


Figure 12
Comparison of separate paper and board collection by regions.
Years 2005-2006.

(Source: Comieco)

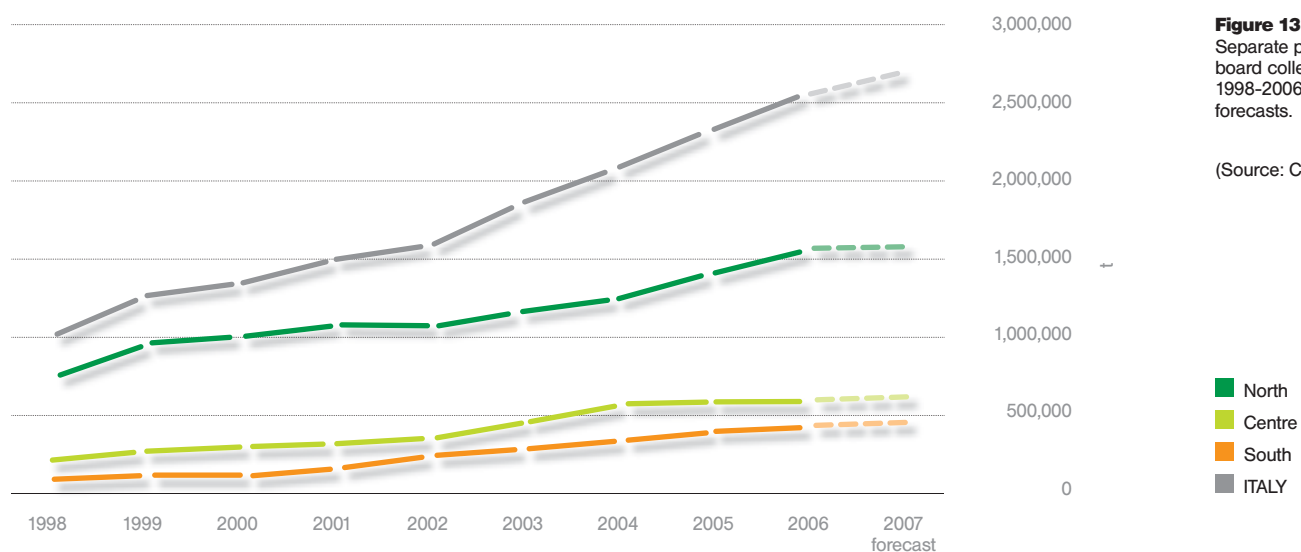


Despite an increase (+14.7%), the South is still lagging behind all expectations.

Lombardy is confirmed again in 2006 as the **reference** region for separate paper and board collection in Italy.

■ 2005
■ 2006

Charts and Tables



Collection (t)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007 forecast
North	756,813	933,687	981,687	1,056,582	1,041,535	1,174,418	1,258,786	1,427,627	1,522,643	1,562,962
Centre	193,958	242,497	278,472	290,074	325,625	427,490	535,827	569,772	596,573	654,844
South	50,222	70,587	88,794	153,985	222,390	268,729	312,979	360,695	413,663	456,259
ITALY	1,000,993	1,246,771	1,348,953	1,500,641	1,589,550	1,870,637	2,107,592	2,358,094	2,532,879	2,706,720

Variations (t)

	1999	2000	2001	2002	2003	2004	2005	2006	2007 prevision
North	176,874	48,000	74,895	-15,047	132,883	84,368	168,841	95,016	40,319
Centre	48,539	35,975	11,602	35,551	101,865	108,337	33,945	26,801	58,271
South	20,365	18,207	65,191	68,405	46,339	44,250	47,717	52,968	42,595
ITALY	245,778	102,182	151,688	88,909	281,087	236,955	250,503	174,785	141,186

A 2-digit percent growth is expected in 2007 in the **South**. In absolute terms, it will be higher compared to the **North**.

Charts and Tables

Table 3
Comparison between urban waste production, total separate collection, and separate paper and board collection in Italy in the 2005-2006 period.

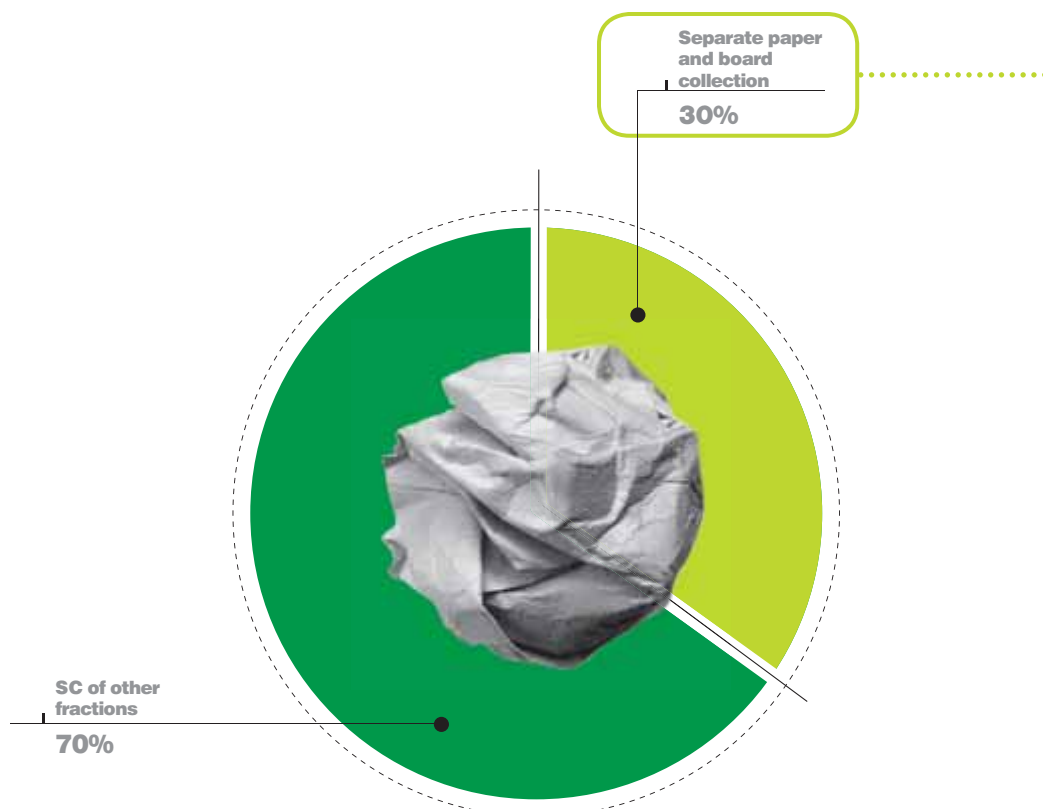
		Year 2005 (data processed by Comieco)	Year 2005 (APAT data)	Year 2006 (Comieco estimate)	Δ % '05-'06 (Comieco data)	Δ % '05-'06 (APAT 05/Comieco 06)
UW	t	31,364,700	31,676,618	32,031,566	2.1	1.1
Overall SC	t	7,736,720	7,697,000	8,456,024	9.3	9.9
Paper and board SC	t	2,358,094	2,311,920	2,532,879	7.4	9.6
Total SC % vs. total UW production	%	24.7	24.3	26.4		
Separate paper and board collection % vs. total SC	%	30.5	30.0	30.0		

(Source: Data processed by Comieco)

Good news for separate collection as a whole. Separate collection of other product fractions (e.g. the organic fraction) is increasing, and its incidence on total paper and board collection is decreasing accordingly.

Figure 14
Estimated rate of separate paper and board collection to total separate collection in 2006.

(Source: Comieco)



The estimated rate of the paper and board fraction to the total composition of separate collection in Italy in 2006 was 30%.

Charts and Tables

Region	Under agreements in 2005 t	Total 2005 t	Under agreements vs. total 2005 %	Under agreements in 2006 t	Total 2006 t	Under agreements vs. total 2006 %
NORTH						
Emilia Romagna	165,493.8	234,752.7	70.5	182,990.0	249,210.7	73.4
Friuli Venezia Giulia	46,202.2	51,348.1	90.0	50,879.7	64,531.3	78.8
Liguria	27,299.4	61,945.0	44.1	29,808.3	66,566.7	44.8
Lombardia	353,975.5	488,688.4	72.4	371,890.1	518,524.5	71.7
Piemonte	200,610.0	284,076.0	70.6	221,938.8	302,198.0	73.4
Trentino Alto Adige	57,345.6	67,131.5	85.4	60,573.3	69,269.9	87.4
Valle d'Aosta	6,718.0	6,718.0	100.0	7,855.5	7,855.5	100.0
Veneto	155,760.1	232,967.3	66.9	149,322.1	244,496.1	61.1
	1,013,404.7	1,427,626.9	71.0	1,075,257.9	1,522,642.7	70.6
CENTRE						
Lazio	115,037.5	208,267.9	55.2	121,248.8	212,480.8	57.1
Marche	39,815.9	51,239.9	77.7	41,161.3	58,640.7	70.2
Toscana	225,016.7	273,326.8	82.3	234,271.1	286,787.6	81.7
Umbria	24,731.0	36,937.5	67.0	24,371.3	38,663.9	63.0
	404,600.1	569,772.1	71.0	421,052.5	596,572.9	70.6
SOUTH						
Abruzzo	26,747.8	31,841.2	84.0	28,554.5	32,351.7	88.3
Basilicata	6,175.6	12,256.8	50.4	7,506.3	12,768.6	58.8
Calabria	33,315.4	34,412.4	96.8	36,052.1	37,164.9	97.0
Campania	83,500.4	87,507.6	95.4	94,843.8	102,893.1	92.2
Molise	118.8	1,962.2	6.1	2,025.4	3,880.1	52.2
Puglia	91,211.0	94,241.1	96.8	105,170.9	107,894.9	97.5
Sardegna	15,835.0	20,496.3	77.3	32,119.1	37,719.9	85.2
Sicilia	72,614.6	77,977.6	93.1	76,405.4	78,990.1	96.7
	329,518.6	360,695.2	91.4	382,677.4	413,663.3	92.5
ITALY						
	1,747,523.4	2,358,094.3	74.1	1,878,987.8	2,532,879.0	74.2

The comparison between collection performed under agreements and total collection in Italy shows that, where the market's interest in being involved is lower, as in the South, it is up to Comieco to ensure separate collection and recycling on the territory. While the ratio is declining in the North, it is as high as 92.5% in the South.

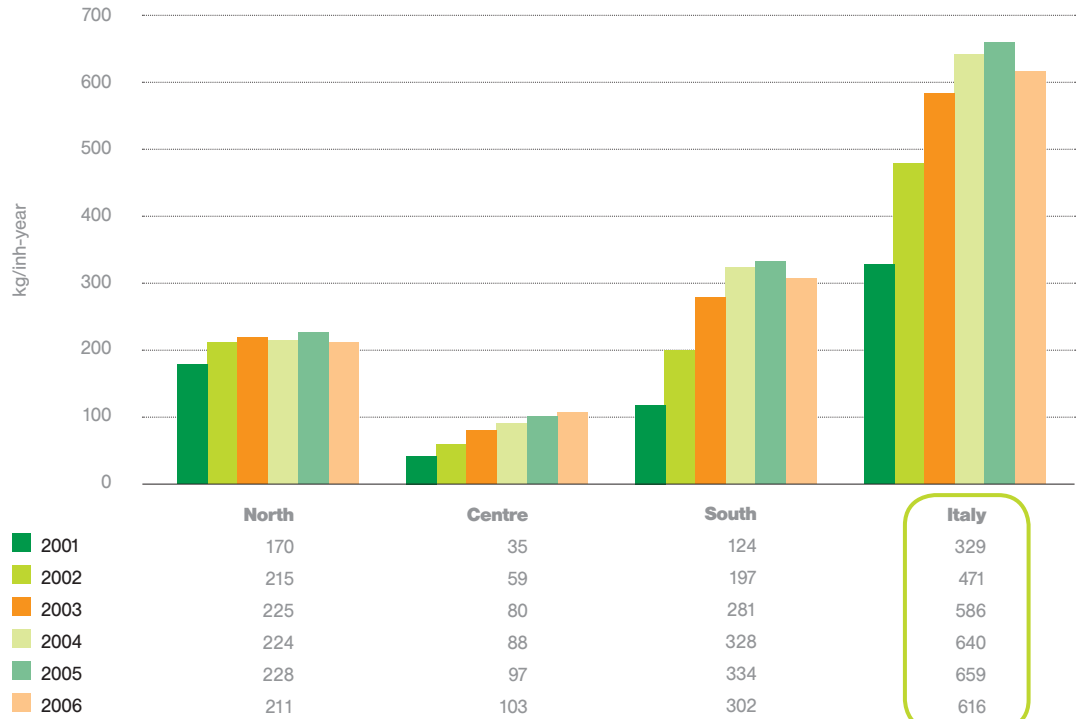
Table 4
Comparison between separate paper and board collection performed under agreements and total separate paper and board collection.

(Source: Comieco)

Charts and Tables

Figure 15
Agreements signed in the
2001-2006 period.

(Source: Comieco)



While the number of agreements signed between local administrations and Comieco is decreasing, the number of inhabitants served by separate collection is increasing, because certain Cities have established Consortia, ATOs, or other forms of aggregation.

Charts and Tables

Region	Inhabitants n	Inhabitants under agreements n	Inhabitants under agreements %	Cities n	Cities under agreements n	Cities under agreements %
NORTH						
Emilia Romagna	3,983,346	3,885,027	97.5	341	330	96.8
Friuli Venezia Giulia	1,183,764	966,282	81.6	219	166	75.8
Liguria	1,571,783	1,281,764	81.5	235	120	51.1
Lombardia	9,032,554	6,739,962	74.6	1,546	1,016	65.7
Piemonte	4,214,677	3,949,312	93.7	1,206	1,077	89.3
Trentino Alto Adige	940,016	831,129	88.4	339	304	89.7
Valle d'Aosta	119,548	119,548	100.0	74	74	100.0
Veneto	4,527,694	3,318,147	73.3	581	388	66.8
	25,573,382	21,091,171	82.5	4,541	3,475	76.5
CENTRE						
Lazio	5,112,413	4,483,845	87.7	378	241	63.8
Marche	1,470,581	1,279,342	87.0	246	203	82.5
Toscana	3,497,806	3,411,566	97.5	287	267	93.0
Umbria	825,826	802,091	97.1	92	75	81.5
	10,906,626	9,976,844	91.5	1,003	786	78.4
SOUTH						
Abruzzo	1,262,392	1,089,696	86.3	305	188	61.6
Basilicata	597,768	336,838	56.3	131	38	29.0
Calabria	2,011,466	1,989,057	98.9	409	402	98.3
Campania	5,701,931	5,081,621	89.1	551	490	88.9
Molise	320,601	122,252	38.1	136	20	14.7
Puglia	4,020,707	3,631,440	90.3	258	198	76.7
Sardegna	1,631,880	1,330,376	81.5	377	259	68.7
Sicilia	4,968,991	4,715,917	94.9	390	338	86.7
	20,515,736	18,297,197	89.2	2,557	1,933	75.6
ITALY	56,995,744	49,365,212	86.6	8,101	6,194	76.5

Table 5
Territorial coverage by regions at December 31, 2006.

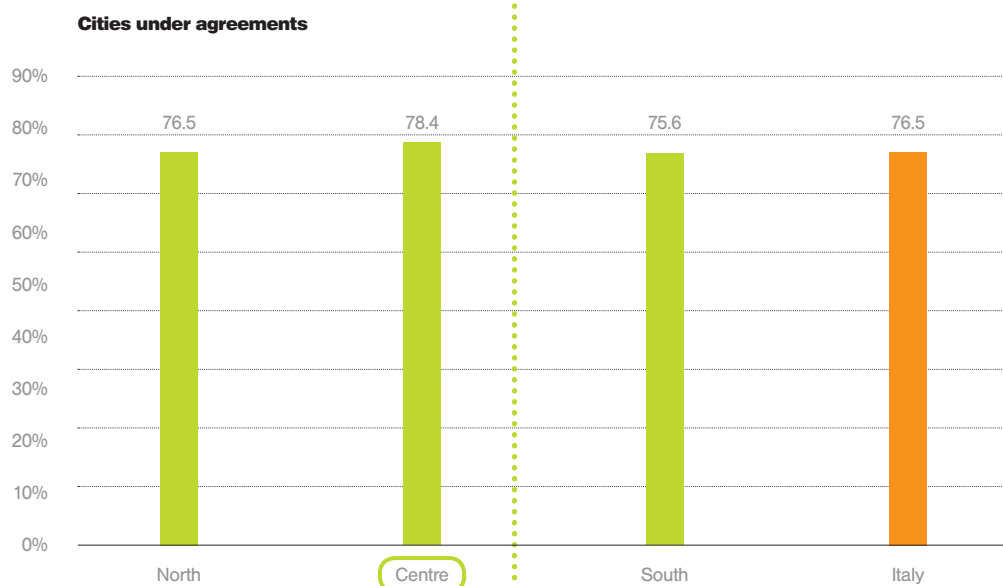
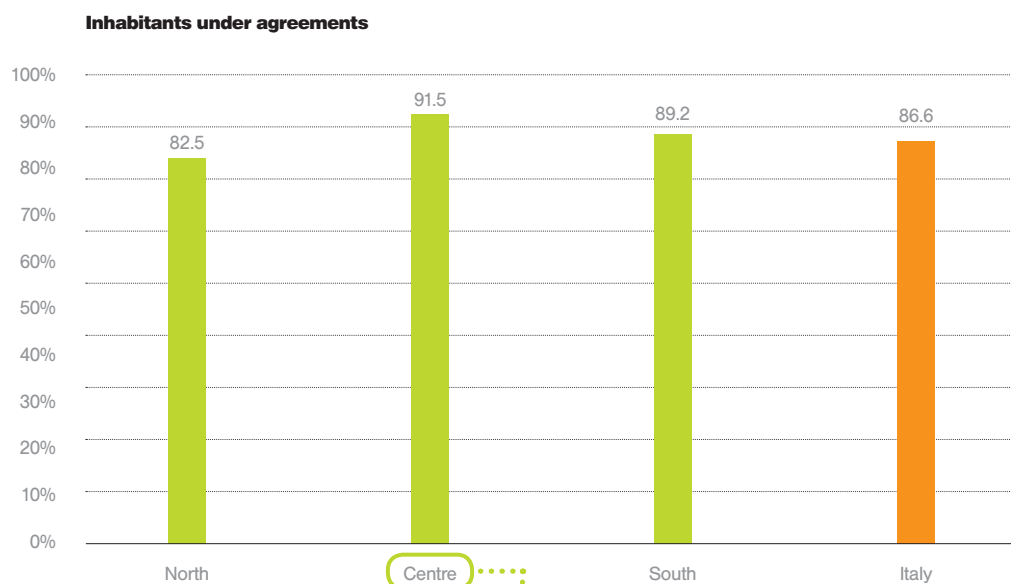
(Source: Comieco)

While separate paper and board collection volumes move at two different speeds, the territorial coverage of the agreements is quite homogeneous throughout the Country, with a 76.5% average. The widest coverage is in **Vallée d'Aoste** (100%), and the most limited coverage is in **Molise** (38.1%).

Charts and Tables

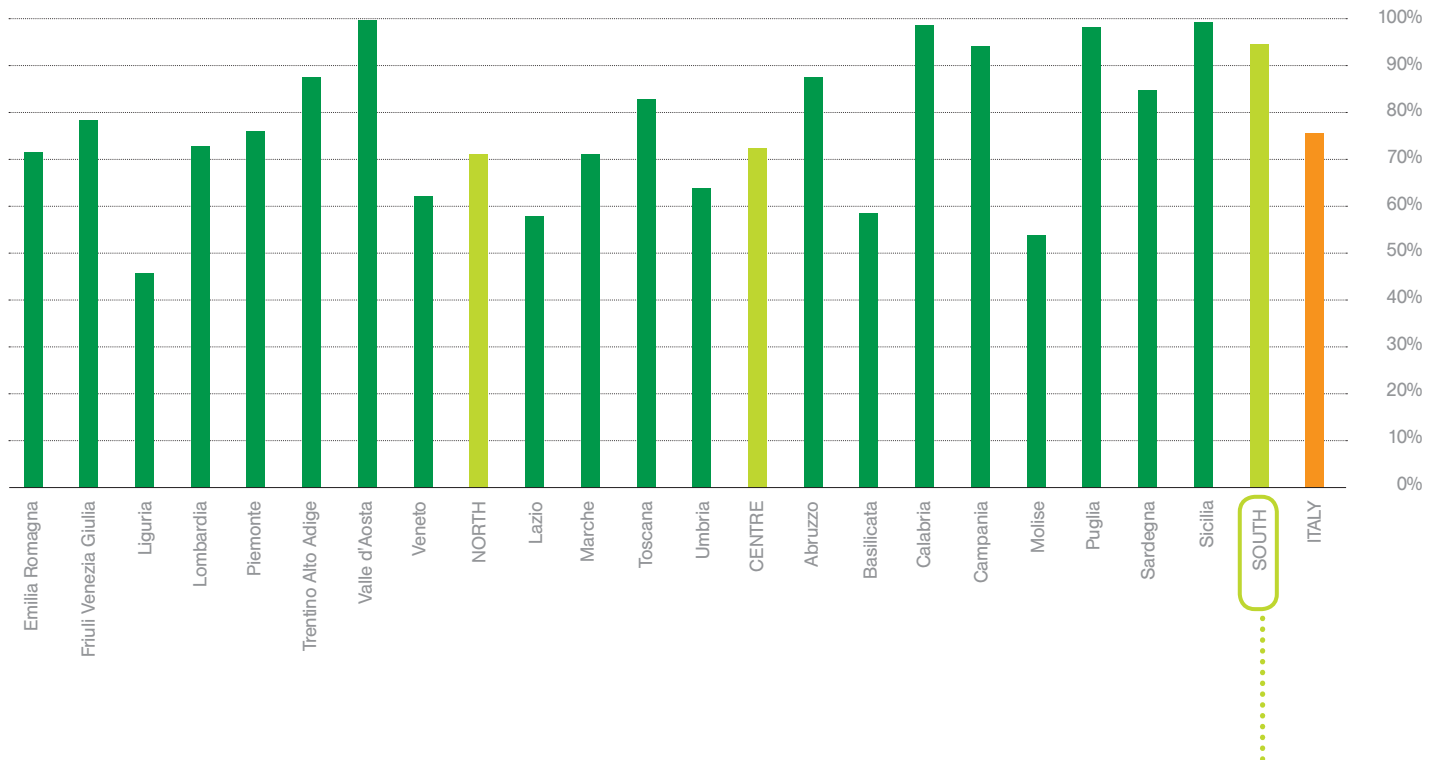
Figure 16
Territorial coverage
by macro-areas at
December 31, 2006.

(Source: Comieco)



Also with respect to territorial macro-areas, the highest values of agreements in terms of inhabitants and number of Cities involved are recorded in **central Italy**.

Charts and Tables



Data shows that the **South** confirms its agreement with Comieco for separate paper and board collection management.

Figure 17
Incidence of separate paper and board collection performed under agreements in 2006 on total separate paper and board collection in the same year. Detailed by Regions and Areas.

(Source: Comieco)

Charts and Tables

Table 6
Resources transferred to parties under agreements in 2006.

(Source: Comieco)

Region	Inhabitants under agreements n	Comieco funding		Recyclers' funding	
		EUR	EUR/inh under agreements	EUR	EUR/inh under agreements
NORTH					
Emilia Romagna	3,885,027	8,459,154.60	2.18	305,198.82	0.08
Friuli Venezia Giulia	966,282	2,713,903.32	2.81	76,587.60	0.08
Liguria	1,281,764	1,652,265.56	1.29	36,428.20	0.03
Lombardia	6,739,962	13,762,444.02	2.04	867,530.82	0.13
Piemonte	3,949,312	7,378,159.34	1.87	561,911.02	0.14
Trentino Alto Adige	831,129	2,986,502.38	3.59	102,801.43	0.12
Valle d'Aosta	119,548	454,762.70	3.80	11,054.29	0.09
Veneto	3,318,147	6,232,272.29	1.88	297,277.89	0.09
	21,091,171	43,639,464.21	2.07	2,258,790.07	0.11
CENTRE					
Lazio	4,483,845	5,507,915.97	1.23	220,961.58	0.05
Marche	1,279,342	1,999,048.02	1.56	50,232.14	0.04
Toscana	3,411,566	11,116,311.33	3.26	403,942.37	0.12
Umbria	802,091	925,095.33	1.15	53,407.27	0.07
	9,976,844	19,548,370.65	1.96	728,543.36	0.07
SOUTH					
Abruzzo	1,089,696	1,397,471.93	1.28	49,013.98	0.04
Basilicata	336,838	426,455.59	1.27	8,919.36	0.03
Calabria	1,989,057	2,000,151.01	1.01	32,366.70	0.02
Campania	5,081,621	4,736,426.57	0.93	135,032.94	0.03
Molise	122,252	96,385.26	0.79	3,105.12	0.03
Puglia	3,631,440	5,702,098.20	1.57	137,419.55	0.04
Sardegna	1,330,376	1,057,400.09	0.79	69,569.52	0.05
Sicilia	4,715,917	4,310,903.00	0.91	63,935.61	0.01
	18,297,197	19,727,291.64	1.08	499,362.77	0.03
ITALY	49,365,212	82,915,126.50	1.68	3,486,696.20	0.07

In 2006 Comieco transferred over 82.9 million EUR to Cities under agreements (including 43.6 million in the North), equal to an average contribution of 1.68 EUR per inhabitant. The recyclers' funding amounted to 3.48 million EUR (including 2.25 million in the North).

Charts and Tables

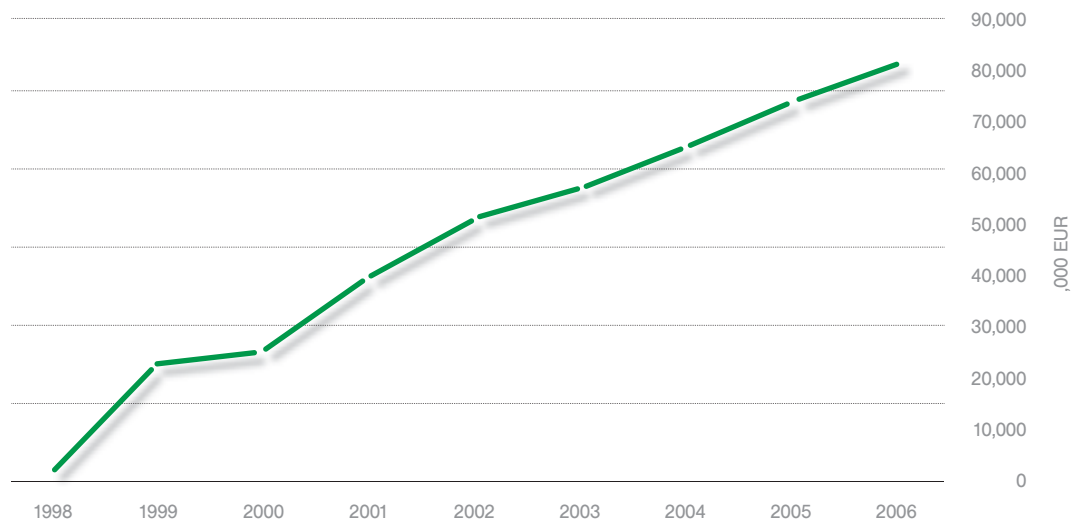


Figure 18
Comieco funding.
1998-2006 trend.

(Source: Comieco)

Funding (,000 EUR)

	Energy recovery	SC	TOT	% variation
1998	0	2,198	2,198	
1999	7,000	17,027	24,027	993.1
2000	8,200	18,211	26,411	9.9
2001	10,500	31,515	42,015	59.1
2002	5,459	47,000	52,459	24.9
2003	0	57,117	57,117	8.9
2004	0	65,366	65,366	14.4
2005	0	74,549	74,549	14.0
2006	0	82,915	82,915	11.2

The financial involvement of the Consortium in the period kept growing and increased a further **11.2%** in the last 12 months.

Note: In the 1999-2002 period considerations were paid (for a total of 31 million EUR) also for the paper and board packaging collected for the purpose of energy recovery.

Charts and Tables

Year 2006	Inhabitants under agreements n	Total managed t	1.01 + 1.02 (joint)		1.04 + 1.05 (selective)		Managed packaging t	F.M.S. t
			t	%	t	%		
NORTH								
Emilia Romagna	3,885,027	182,990.0	100,394.4	54.9	82,595.7	45.1	106,690.3	76,299.7
Friuli Venezia Giulia	966,282	50,879.7	25,193.3	49.5	25,686.4	50.5	31,732.8	19,146.9
Liguria	1,281,764	29,808.3	11,983.0	40.2	17,825.4	59.8	20,701.3	9,107.0
Lombardia	6,739,962	371,890.1	285,372.0	76.7	86,518.1	23.3	155,007.4	216,882.7
Piemonte	3,949,312	221,938.8	184,839.1	83.3	37,099.6	16.7	81,461.0	140,477.8
Trentino Alto Adige	831,129	60,573.3	33,816.3	55.8	26,757.1	44.2	34,873.0	25,700.4
Valle d'Aosta	119,548	7,855.5	3,636.3	46.3	4,219.3	53.7	5,092.0	2,763.6
Veneto	3,318,147	149,322.1	97,788.8	65.5	51,533.4	34.5	75,002.7	74,319.5
	21,091,171	1,075,257.9	743,023.1	69.1	332,234.8	30.9	510,560.4	564,697.5
CENTRE								
Lazio	4,483,845	121,248.8	72,684.7	59.9	48,564.1	40.1	66,008.4	55,240.4
Marche	1,279,342	41,161.3	16,523.7	40.1	24,637.5	59.9	28,603.2	12,558.0
Toscana	3,411,566	234,271.1	132,875.8	56.7	101,395.3	43.3	133,285.5	100,985.6
Umbria	802,091	24,371.3	17,568.2	72.1	6,803.1	27.9	11,019.5	13,351.8
	9,976,844	421,052.5	239,652.4	56.9	181,400.1	43.1	238,916.7	182,135.8
SOUTH								
Abruzzo	1,089,696	28,554.5	16,123.0	56.5	12,431.5	43.5	16,301.0	12,253.5
Basilicata	336,838	7,506.3	2,934.0	39.1	4,572.3	60.9	5,276.4	2,229.8
Calabria	1,989,057	36,052.1	10,646.9	29.5	25,405.2	70.5	27,960.5	8,091.7
Campania	5,081,621	94,843.8	44,418.7	46.8	50,425.1	53.2	61,085.6	33,758.2
Molise	122,252	2,025.4	1,021.4	50.4	1,004.0	49.6	1,249.2	776.3
Puglia	3,631,440	105,170.9	45,203.8	43.0	59,967.1	57.0	70,816.0	34,354.9
Sardegna	1,330,376	32,119.1	22,884.7	71.2	9,234.4	28.8	14,726.7	17,392.4
Sicilia	4,715,917	76,405.4	21,031.5	27.5	55,374.0	72.5	60,421.5	15,983.9
	18,297,197	382,677.4	164,264.1	42.9	218,413.4	57.1	257,836.7	124,840.7
TOTAL ITALY	49,365,212	1,878,987.8	1,146,939.5	61.0	732,048.3	39.0	1,007,313.7	871,674.1

Year 2005	Inhabitants under agreements n	Total managed t	1.01 + 1.02 (joint)		1.04 + 1.05 (selective)		Managed packaging t	F.M.S. t
			t	%	t	%		
NORTH								
CENTRE								
SOUTH								
TOTAL ITALY	48,626,170	1,747,523.4	1,041,245.3	59.6	706,278.1	40.4	945,764.5	801,758.9

Table 7
Amounts managed under agreements in 2006: distinction between materials originating from joint and selective collection and comparison with the year 2005.

The input of households is growing. While in the North the average "joint" collection performed by households reaches 69.1% of the total, "selective" collection takes the lion's share in the South, with 57.1%, and even more than 70% in Sicily and Calabria. This is, therefore, where the input of households to separate collection should be stimulated and promoted.

(Source: Comieco)

Charts and Tables

Cities	2003	2004	2005	2006	1.01 + 1.02 '06	1.04 + 1.05 '06	Inhabitants	Per-capita '06	Δ '05-'06 %
	t	t	t	t	t	t	n	kg/inh-year	
Ancona	4,068	4,469	4,547	4,509	3,275	1,234	100,507	44.9	-0.9
Aosta	1,534	1,709	1,914	2,238	1,036	1,202	34,062	65.7	16.9
Bari	13,784	13,639	16,284	21,572	9,595	11,977	316,532	68.2	32.5
Bologna	6,041	5,573	5,302	6,294	1,651	4,643	371,217	17.0	18.7
Bolzano	5,598	6,048	6,255	6,769	3,620	3,148	94,989	71.3	8.2
Brescia	12,140	13,185	13,633	14,414	8,204	6,209	187,567	76.8	5.7
Campobasso	nd	nd	nd	934	615	318	50,762	18.4	n.a.
Catanzaro	838	1,054	1,396	1,525	407	1,118	95,251	16.0	9.2
Firenze	26,920	29,439	29,990	31,145	25,798	5,347	356,118	87.5	3.9
Genova	15,137	16,852	19,385	15,907	9,489	6,418	610,307	26.1	-17.9
L'Aquila	2,713	2,692	2,581	2,550	859	1,691	68,503	37.2	-1.2
Milano	78,021	83,735	85,148	89,737	70,592	19,145	1,256,211	71.4	5.4
Napoli	13,653	14,737	17,492	20,707	12,229	8,477	1,004,500	20.6	18.4
Palermo	9,051	12,332	15,599	16,485	7,256	9,229	686,722	24.0	5.7
Perugia	3,329	4,207	4,833	4,054	2,836	1,218	149,125	27.2	-16.1
Potenza	1,922	1,892	2,011	2,710	1,151	1,559	69,060	39.2	34.8
Reggio Calabria	2,291	3,384	4,153	4,856	2,102	2,754	180,353	26.9	16.9
Roma	63,885	76,525	91,599	99,011	61,411	37,600	2,546,804	38.9	8.1
Salerno	3,175	3,490	3,702	3,744	1,875	1,869	138,188	27.1	1.1
Sassari	772	558	681	2,180	1,952	228	120,729	18.1	220.1
Torino	45,629	49,298	52,856	59,187	53,152	6,035	865,263	68.4	12.0
Trento	5,913	7,577	8,625	10,166	6,519	3,647	104,946	96.9	17.9
Trieste	5,751	6,263	6,573	7,138	4,770	2,369	211,184	33.8	8.6
Verona	11,139	12,854	13,484	13,575	11,491	2,085	253,208	53.6	0.7
Viterbo	666	967	1,034	1,301	463	838	59,308	21.9	25.9

Table 8
Trend of separate paper and board collection performed under agreements in some sample cities.

(Source: Comieco)

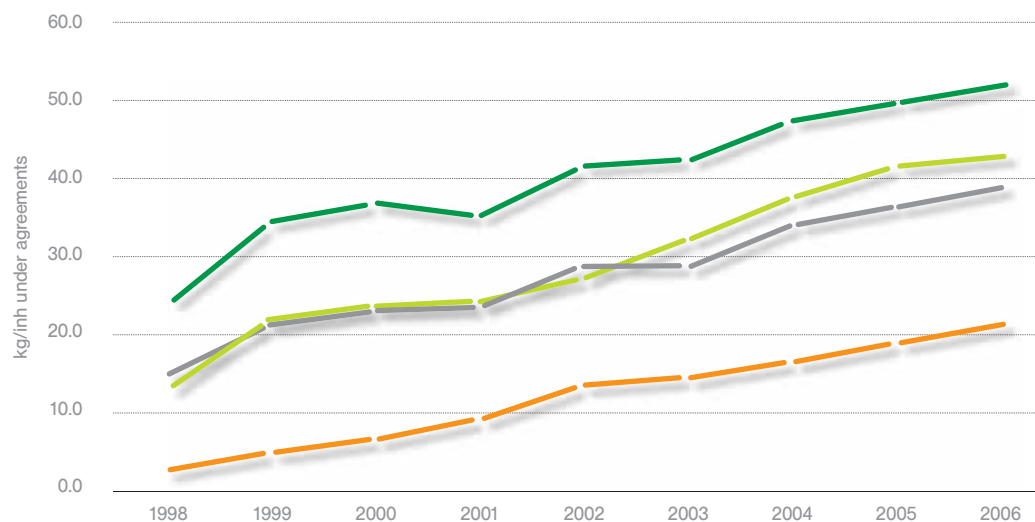
Note: in some cities (e.g. Bologna) the figure is partial because of the opportunity to manage certain collection flows out of the agreements.

Trento is the best performer, Catanzaro the worst. The per-capita collection ranking in Italy, in absolute values, sees Trento in the first position with 96 kg and Catanzaro in the last with 16 kg. Households in Trento collected 6,519 tons, vs. only 407 in Catanzaro.

Charts and Tables

Figure 19
Per-capita collection performed under agreements. 1998-2006 trend.

(Source: Comieco)

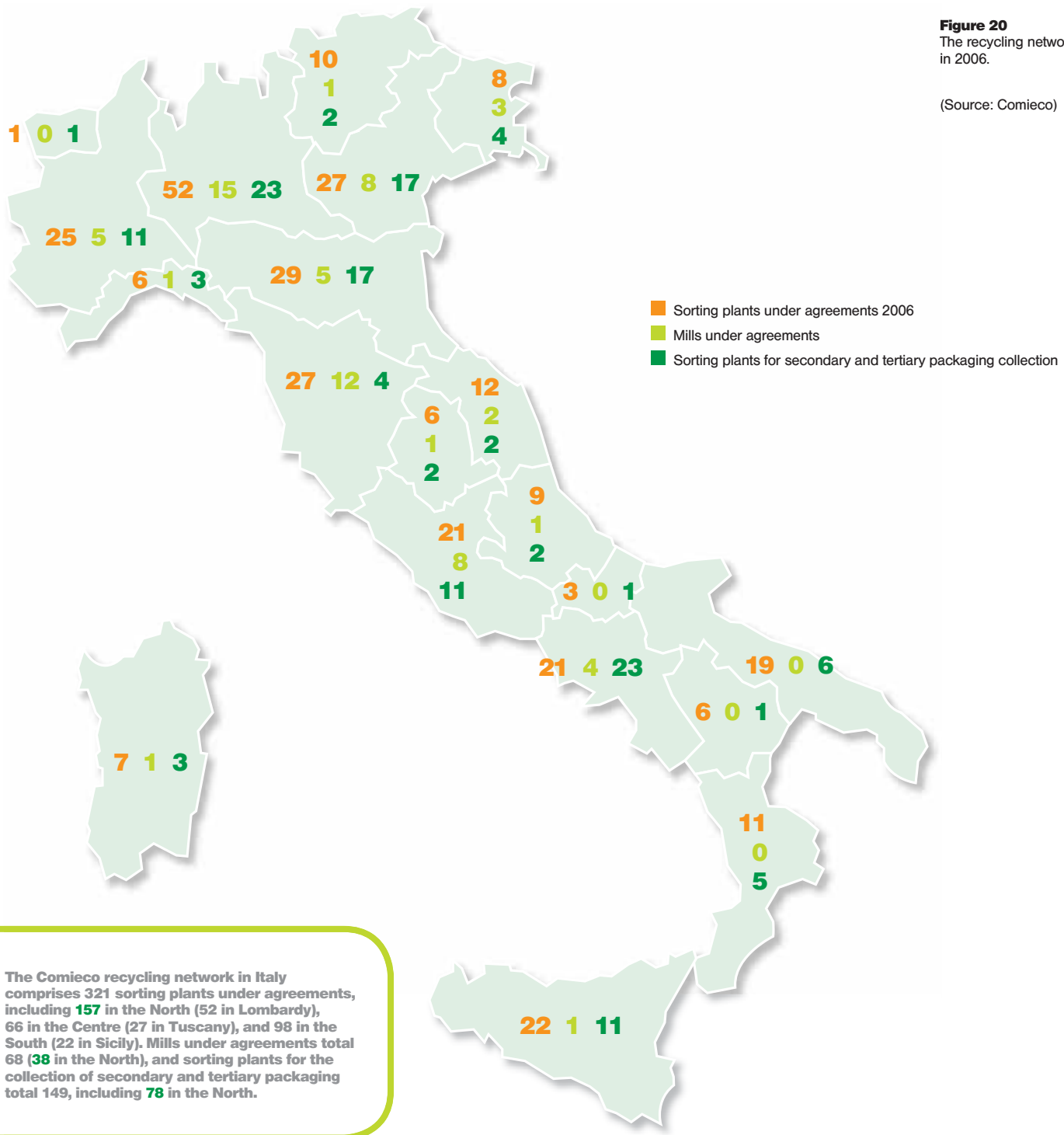


kg/inh under agreements

	1998	1999	2000	2001	2002	2003	2004	2005	2006
NORTH	23.6	33.7	35.8	34.7	40.9	41.8	46.4	48.7	51.0
CENTRE	13.7	21.5	23.1	23.4	27.7	31.4	37.1	40.7	42.2
SOUTH	2.6	5.0	6.5	9.0	13.5	14.6	16.4	18.4	20.9
ITALY	14.3	21.4	23.2	23.3	28.7	29.8	33.5	35.9	38.1

Per-capita collection keeps growing in Cities under agreements, and totalled an average of **38.1 kg** per inhabitant in Italy in 2006 (51 kg in the North vs. 20.9 kg in the South).

Charts and Tables

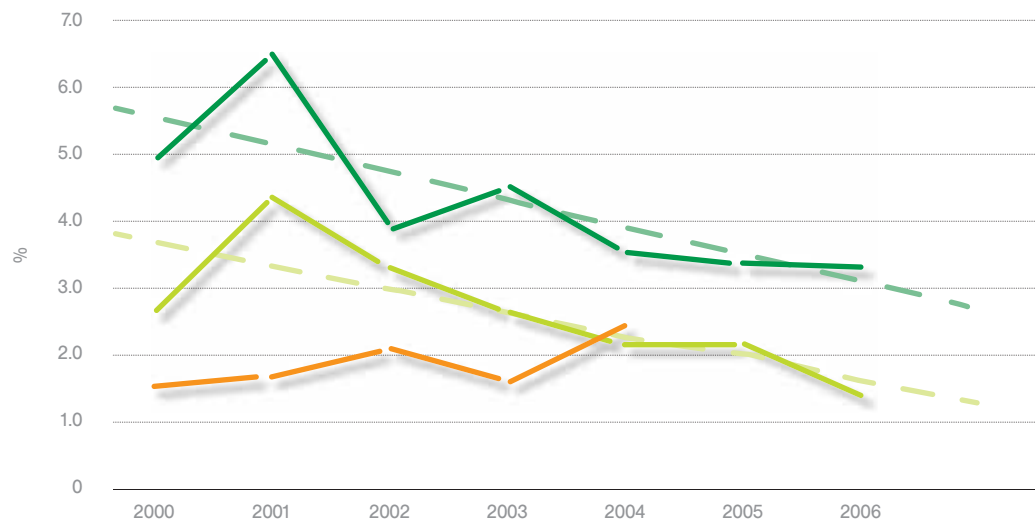


Region	Sorting plants under agreement 2006	Mills under agreements	Sorting plants for secondary and tertiary packaging collection
NORTH	157	38	78
CENTRE	66	23	19
SOUTH	98	7	52
TOTAL ITALY	321	68	149

Charts and Tables

Figure 21
Quality of the collected material.
2000-2006 period.

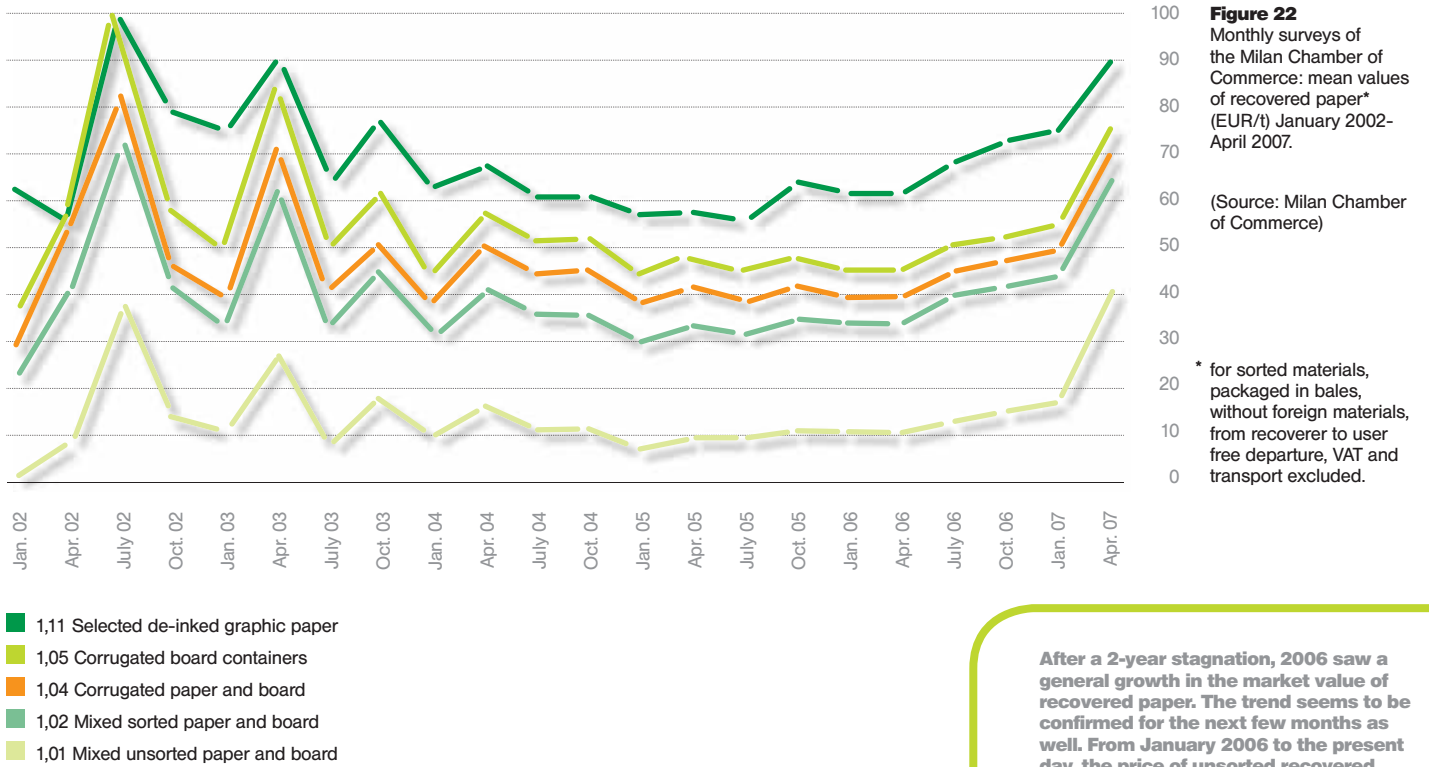
(Source: Comieco)



Collection	Data	2000	2001	2002	2003	2004	2005	2006
1.01 + 1.02	Analyzed quantities (kg)		26,166	42,657	119,814	103,884	76,609	188,826
	Foreign fractions (%)	4.9	6.5	3.9	4.5	3.5	3.3	3.3
	Performed analyses (n)	27	171	275	533	443	321	772
1.02 + 1.04	Analyzed quantities (kg)		1,647	1,635	17,504	4,604		
	Foreign fractions (%)	1.4	1.5	1.9	1.4	2.3	n.a.	n.a.
	Performed analyses (n)	10	24	77	44	15		
1.04 + 1.05	Analyzed quantities (kg)		25,455	33,181	62,104	119,124	62,936	145,873
	Foreign fractions (%)	2.5	4.3	3.2	2.6	2.0	2.0	1.2
	Performed analyses (n)	26	122	165	281	335	291	779

Not only quantities are significant. Comieco is investing resources to monitor, and therefore constantly improve, the quality of recovered paper, in order to ensure a supply of high-quality secondary raw materials. The incidence of foreign fractions on joint collection has decreased from 6.5% in 2001 to 3.3% in 2006. Foreign fractions in selective collection, on the other hand, have fallen to 1.2%. The number of quality control analyses on the materials has increased fivefold in the same period.

Charts and Tables



After a 2-year stagnation, 2006 saw a general growth in the market value of recovered paper. The trend seems to be confirmed for the next few months as well. From January 2006 to the present day, the price of unsorted recovered paper and board grew from 10 to 37.50 EUR, with a 21 EUR increase in the last four months.

Year 2006	Packaging paper and board			Graphic paper	Paper for hygienic-sanitary use	Other types of paper	Total paper production
	Paper and board for corrugated board	Cardboard for boxes	Other wrapping and packaging paper and board				
Production	2,832,587	618,734	1,210,117	3,380,756	1,410,506	555,660	10,008,360
Imports	1,355,063	541,493	456,325	2,680,757	58,817	84,005	5,176,460
Exports	229,531	423,591	487,626	1,530,657	719,280	100,550	3,491,235
Apparent consumption	3,958,119	736,636	1,178,816	4,530,856	750,043	539,115	11,693,585

The paper and board import-export balance was negative for **1,685,225 t** in 2006. The market segments that are most dependent on imports include paper and board and graphic paper.

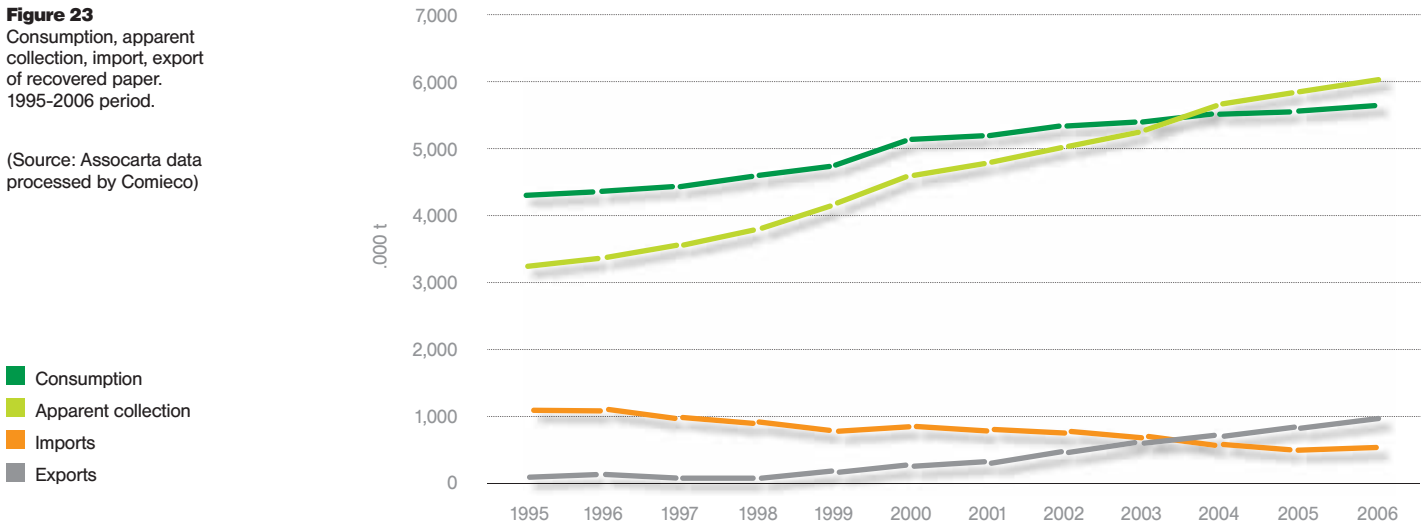
Table 9
Production, import, export, and apparent paper and board consumption.

(Source: ISTAT data and Assocarta estimates processed by Assocarta)

Charts and Tables

Figure 23
Consumption, apparent collection, import, export of recovered paper. 1995-2006 period.

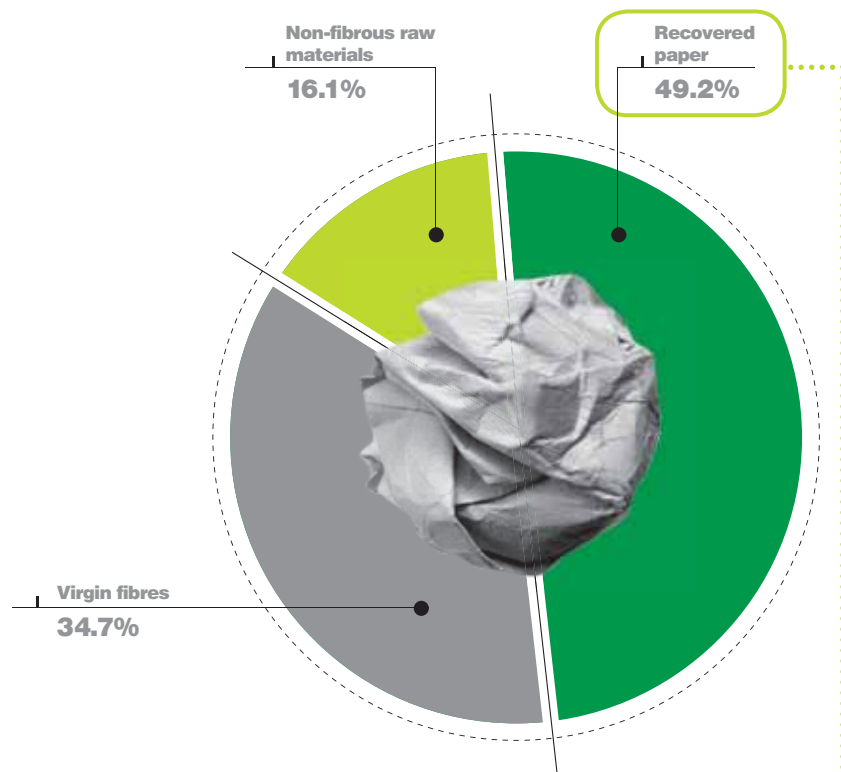
(Source: Assocarta data processed by Comieco)



There are **positive indicators** of the recovered paper market, which shows a strong growth of apparent collection and exports, by now twice as high as the volume of imports.

Figure 24
Raw materials in the paper industry in 2005.

(Source: Assocarta and Comieco)



The raw materials used by the national paper industry include **49.2%** recovered paper and only **34.7%** virgin fibres.

Charts and Tables

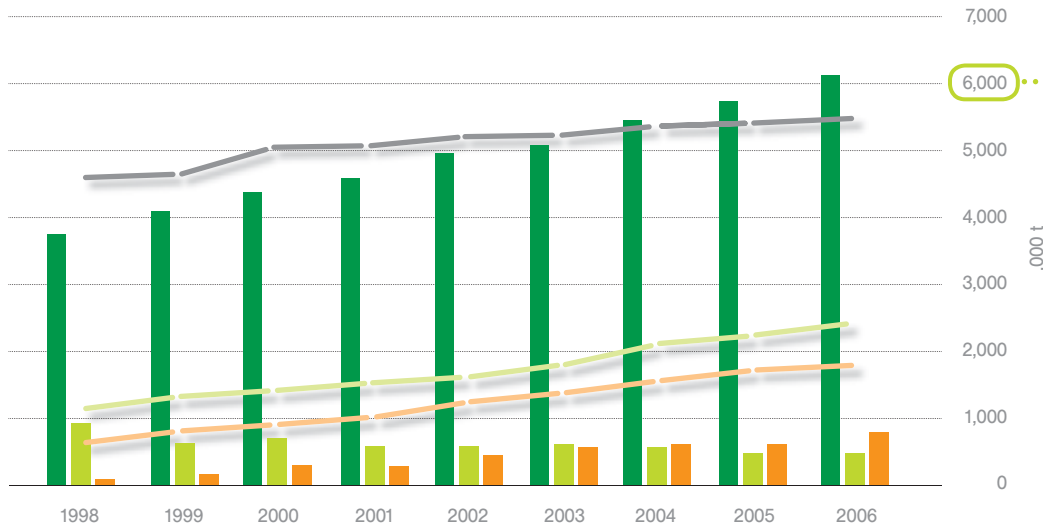


Figure 25
Separate collection, consumption of recovered paper, and national available recovered paper (,000 t).

(Source: Comieco)

- National recovered paper
- Imports
- Exports
- Recovered paper consumption
- Separate paper and board collection
- Separate paper and board collection managed by Comieco

In 2006 national recovered paper was just more than **6 million t**, including 2.53 million t originating from separate collection. Seventy-four percent of the cities' separate collection is managed by Comieco. The figure falls to 30% if the entire recovered paper collection is considered.

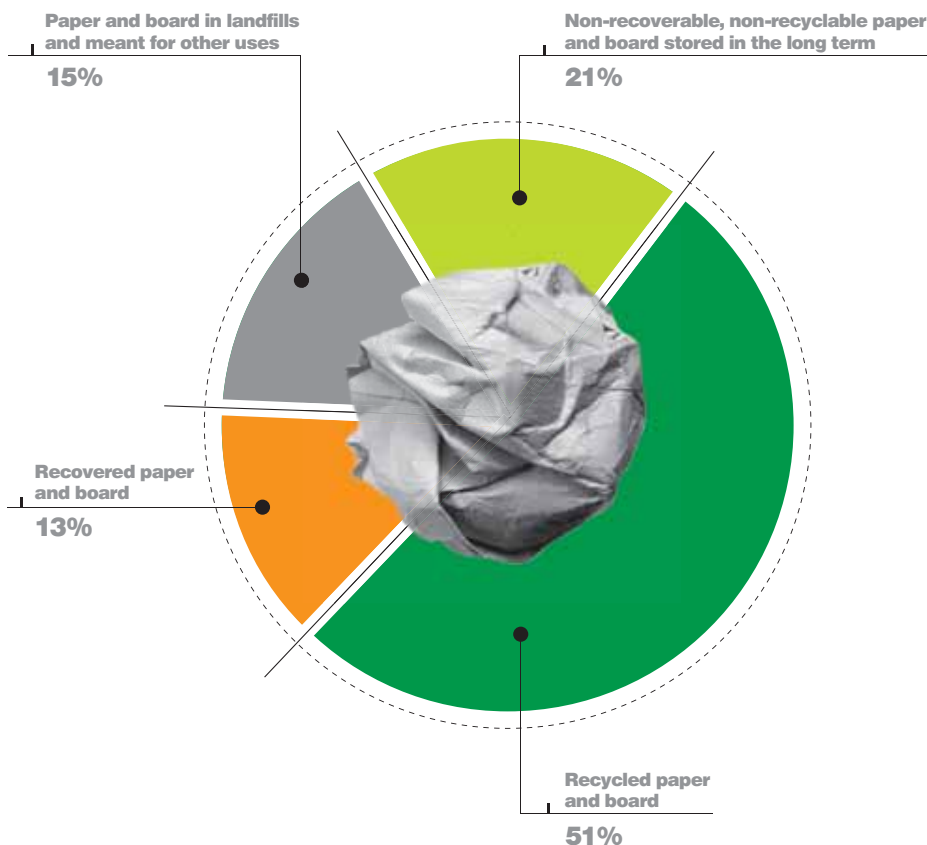


Figure 26
Destination of paper and board products in use in Italy in 2005.

(Source: Assocarta data processed by Comieco)

The final destination of the paper and board consumed in Italy is **51% recycling and 13% other forms of recovery**. Of the remaining share, currently non-recoverable, **15% is disposed of in landfills and 21% is stored in the long term**.

Charts and Tables

Table 10
Recycling and recovery
results achieved in 2006.

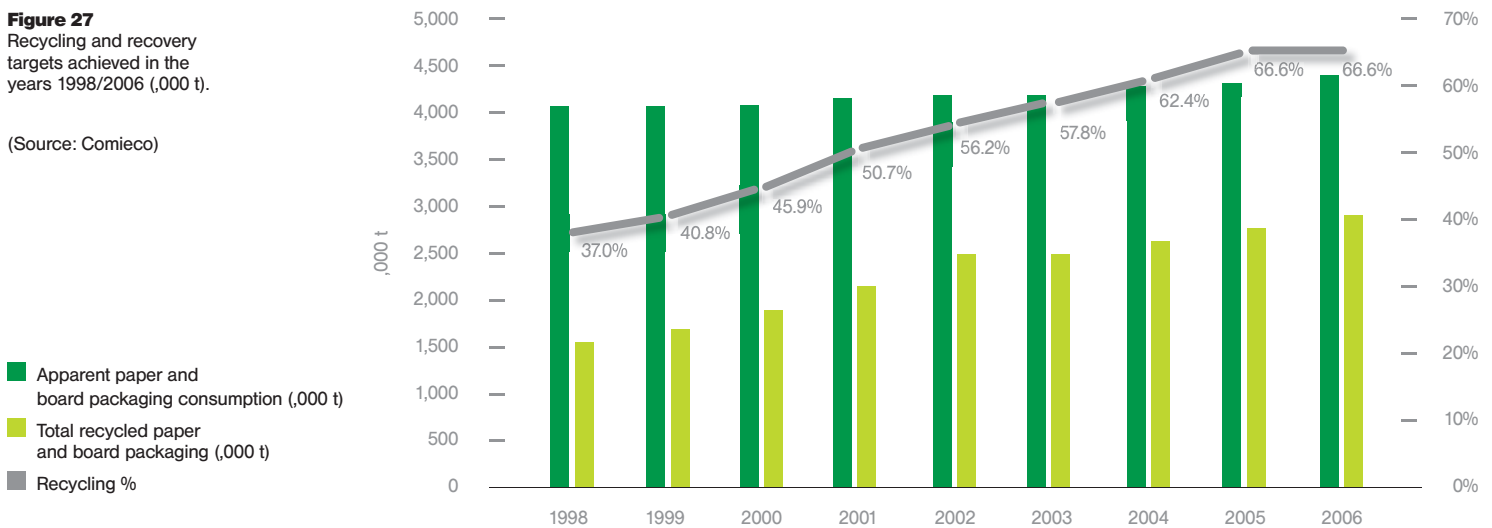
(Source: Comieco)

Recycling and recovery rate calculation (values in tons)		Year 2006
Apparent paper and board packaging consumption		4,399,668
Packaging waste from mixed paper and board collection		279,641
Packaging waste from corrugated board collection		2,367,279
Packaging waste sent abroad for recycling (ISTAT data)		283,791
TOTAL PAPER AND BOARD PACKAGING WASTE FOR RECYCLING		2,930,711
RECYCLING %		66,61
Paper and board packaging recovered as energy or waste fuel based		400,461
TOTAL PAPER AND BOARD PACKAGING RECOVERED		3,331,172
RECOVERY %		75,71

Last year **4,399,668 t** of paper and board packaging were available for consumption. **75.71%** of this packaging was recovered and **66.61%** was recycled as raw material. About **9%** was used for energy recovery.

Figure 27
Recycling and recovery
targets achieved in the
years 1998/2006 (,000 t).

(Source: Comieco)



	1998	1999	2000	2001	2002	2003	2004	2005	2006
Apparent paper and board packaging consumption (,000 t)	4,023	4,051	4,089	4,160	4,218	4,208	4,333	4,315	4,400
Total recycled paper and board packaging (,000 t)	1,489	1,652	1,877	2,109	2,369	2,432	2,703	2,875	2,931
Recycling %	37.0	40.8	45.9	50.7	56.2	57.8	62.4	66.6	66.6

The volume of apparent paper and board packaging consumption increased by **10%** in nine years, but the recycling targets almost doubled in the same period, from **36%** in 1998 to **66.6%** in 2006.



**Every year in Italy,
separate paper and board collection
allows to avoid noxious emissions
into the atmosphere
equal to the full block of road traffic
for as long as 6 days and 6 nights!**

**Recycling one kg of paper allows
to make up for the CO₂ emissions
that a small-displacement car
produces to run**

9 km

Note on the method

The definition of the separate paper and board collection share not managed by the Consortium was the object of a survey aimed primarily at collecting official data.

In particular Comieco, based on co-operations initiated in the previous years, signed a memorandum of understanding with UPI (Unione Province Italiane, the Union of Italian Provinces) and established a number of contacts with the Provincial Waste Observatories for data collection.

Only when official data was not available (from ARPA, OPR, Cities, or operators), Comieco adopted the method described below. Upon completing the survey, 43.3% of the collection data came from official sources, and partly overlapped with the data already available to Comieco; 46.3% referred to quantities managed directly by the Consortium (without other official sources); and 10.4% were based on estimates.

In order to estimate the quantities not managed by Comieco, and not available from the above-mentioned official sources, 3 groups of provinces were considered:

- Group A, i.e. the provinces where Comieco covers more than 85% of the inhabitants through the agreements;
- Group B, i.e. the provinces where Comieco covers 51 to 85% of the inhabitants through the agreements;
- Group C, i.e. the provinces where Comieco covers 20 to 50% of the inhabitants through the agreements.

A direct survey was then carried out on Cities and service companies, aimed at understanding how many of the Cities not involved in the agreements have introduced the separate paper and board collection service.

If the surveyed City/Operator provided information on the introduction, if any, of the collection service, as well as data on collection, such data was included among the official sources.

On the other hand, if no data on quantities was available, attempts were made to identify the rate of inhabitants under agreements, but performing separate paper and board collection: for these, the same per-capita value recorded for the inhabitants under agreements in that province was assumed.

Hence the data on collection was calculated and added to the data referring to the share managed by Comieco, so as to estimate total collection in the considered territory.

It should be noted that the paper and board collection data for the city of Milan and for the Regions of Emilia Romagna, Piedmont, and Umbria, referring to the year 2005, was adjusted after a final analysis.

This accounts for the difference compared to the previous Report.

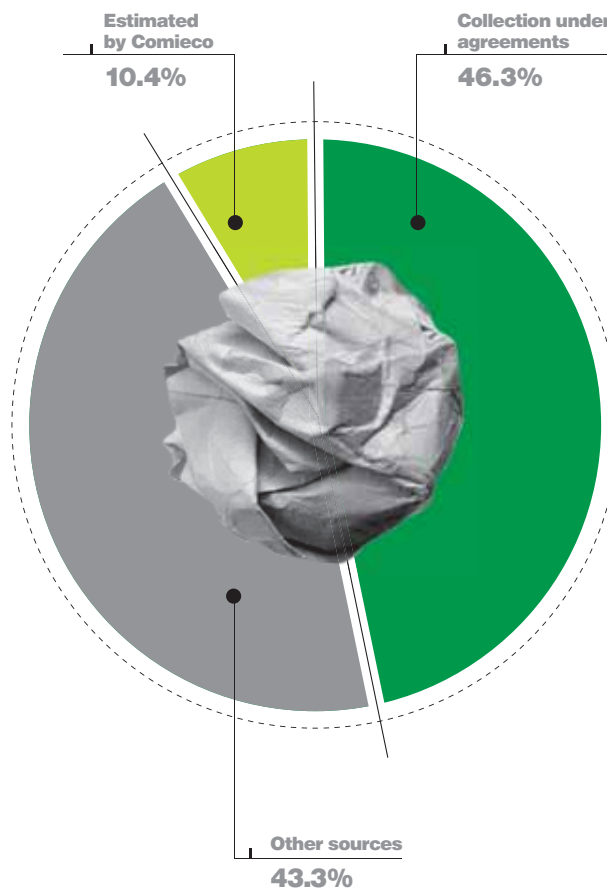



Figure 28
Sources and method

(Source: Comieco)

Group	Inhabitants under agreements	Inhabitants not involved in the agreements on which SC activation should be checked
A	AB > 85%	at least 25%
B	51% < AB < 85%	at least 50%
C	20% < AB < 50%	at least 75%



**Separate collection
has turned Italy into a net exporter
of recovered paper,
with a positive balance of more than**

400,000
tons

Cost-benefit analysis of separate paper and board collection in Italy

(updated at 31.12.2005)

This section is dedicated to an update, with reference to the 2005 data, of the study “Cost-benefit analysis of separate paper and board collection in Italy: The balance of benefits of separate paper collection in Italy,” that AGICI carried out for Comieco: having collected about 12 million tons of paper and board from 1999 to 2005 resulted into benefits for more than 1 billion EUR. The purpose of this section is thus to present the balance of the benefits of separate paper and board collection in Italy from 1999 to 2005, in order to give an economic, as well as an environmental value to the results of separate paper and board collection since the introduction of the Comieco system.

The starting point is a review of the final separate paper and board collection volumes of 2004, previously estimated; the final data of 2005 was then included in the historical series.

Globally, the paper and board volumes collected separately grew from 9.5 million tons in 2004 to the current 11.9 million tons in 2005 (Figure 29).

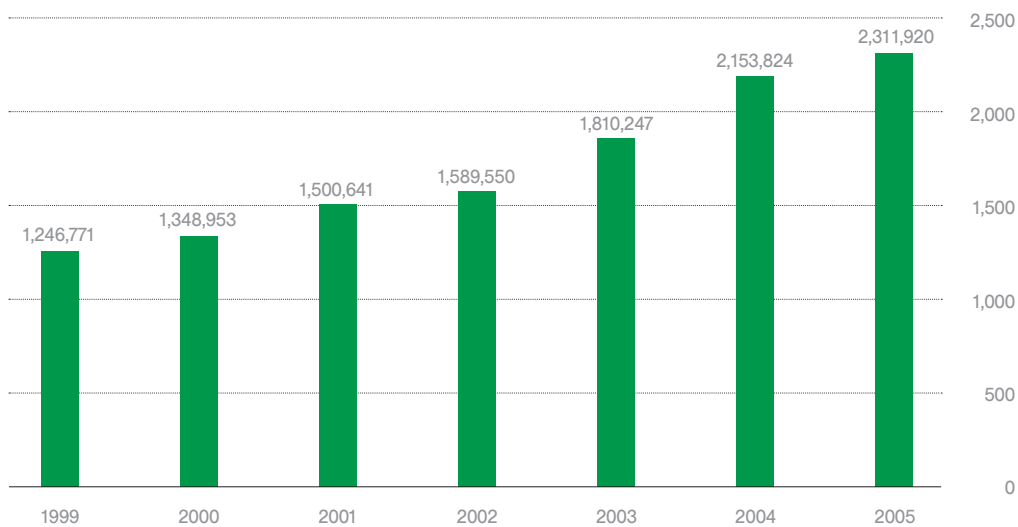


Figure 29
Annual trend of separate
paper and board
collection in Italy.

(Source: Data APAT
processed by AGICI)

The total separate collection volumes in 2005 amounted to 11.9 million separately collected tons.

When the same method was applied to the cost-benefit analysis, the net balance of the benefits of a separate collection – from 1999 to 2005 – of more than 11.9 million tons of paper and board turned out higher than 1 billion EUR.

Cost-benefit analysis of separate paper and board collection in Italy

Table 11
Benefits of separate
paper and board
collection in Italy from
1999 to 2005.

(Source:
data processed by AGIC)

Values in EUR	Optimistic scenario	Fair Value	Pessimistic scenario
Differential cost of SC	291,870,506	247,212,724	193,782,877
Cost due to non-generated energy	42,533,064	42,533,064	42,533,064
Environmental benefits from avoided emissions	268,597,538	356,633,384	435,775,360
Economic benefits from non-disposal	514,900,221	531,073,677	701,672,160
Value of the generated raw materials	203,040,908	233,413,426	272,737,367
Social benefit from generated employment	246,801,348	246,801,348	246,801,348
BENEFIT BALANCE FROM 1999 TO 2005	898,936,446	1,078,176,046	1,420,670,294

The figure includes:

- economic items, i.e. the costs (or lost revenues) and the benefits (or non-accrued costs);
- environmental effects, through a money evaluation of environmental costs and benefits;
- social impacts, through a money estimate of the social costs and benefits.

It should be noted that the analysis is founded on differential evaluations based on different assumed scenarios:

1. an "historical scenario", which was actually in place with the development of separate collection;
2. an assumed scenario without separate collection, i.e. with a non-separate collection and waste disposal system without recovering and recycling the materials.

Below is a brief review of the considered items.

Differential cost of separate collection: This item refers to the higher cost of performing separate paper and board collection compared to the cost of non-separate collection of equivalent volumes in time. The data source is the "Evaluation of the management costs of the urban hygiene service in Italy" (Apat-ONR Reports). The cost is the mean of annual surveys.

Cost due to non-generated energy: This item refers to the money value of the energy that could have been generated through the incineration of the paper and board volumes collected separately every year. Based on the total quantity of waste incinerated per year (Apat data), according to estimates, about 1 million tons of paper and board were not processed from 1999 to 2005, with a non-generation of about 838 GWh of energy. The money value is calculated based on the average annual wholesale cost of a GWh.

Environmental benefits from avoided emissions:

This item shows the benefits of separate collection on the environment resulting from a reduction of CO₂ emissions due to a more limited use of new raw materials and to non-disposal, however net of the emissions due to separate collection. The avoided emissions figure per ton of paper collected separately results from the analysis of the full paper and board collection and sorting cycle performed by Comieco (Comieco – AmbientItalia), which shows an actual benefit of 1,308 kg of CO₂ avoided per ton, calculated as follows: CO₂ from collection and sorting activities (+32 kg/t) - CO₂ avoided due to recycling (-310 kg/t) - CO₂ avoided through different disposal methods (-1,130 kg/t) = -1,308 kg CO₂ per ton of recycled paper.

Economic benefits from non-disposal:

We calculated the lower cost resulting from the non-disposal of 11.9 million tons of paper that were recycled and not disposed of from 1999 to 2005. The avoided costs were estimated in proportion to the annual rate of use of each possible waste management system: landfill, composting, incineration, biostabilization, and waste-based fuel production.

Value of generated raw materials: this is the money value of the recovered paper generated from separate collection based on the annual trend of the list price for type 1.01 (source: Chamber of Commerce).

Social benefits from generated employment:

The introduction of separate collection generates employment, calculated with reference to the number of operators theoretically required to perform separate collection in time, through an estimate of the required hours. The money value is based on the gross salary of urban hygiene operators.

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