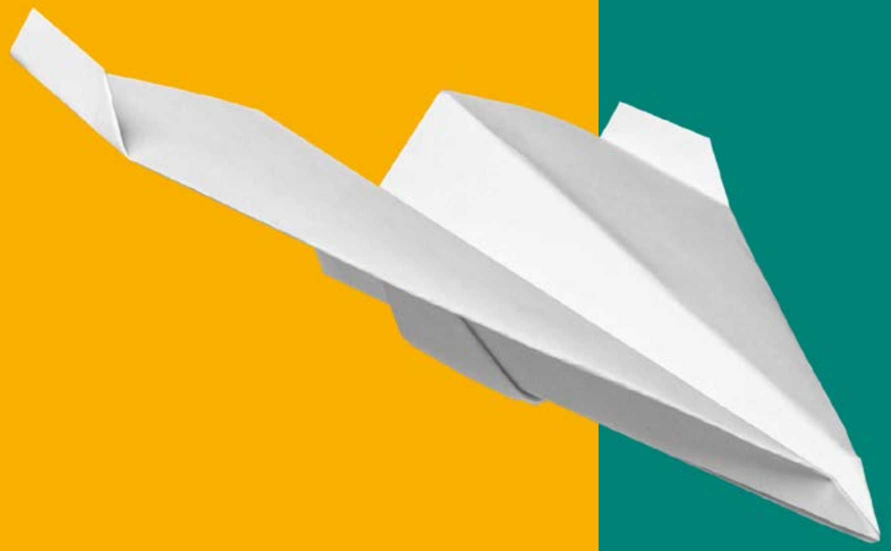
25th REPORT

Collection, Recycling, and Recovery of Paper and Board

Data for the year
2019

July 2020

35 ANNI comieco
Consorzio Nazionale Recupero e Riciclo degli Imballaggi a base Cellulosica



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ACRONYMS

CTA Comieco Technical Annex

FMS Frazioni Merceologiche Similari (similar product fractions) (non-packaging paper and board)

SC Separate Collection

UW Urban Waste

% Percent rate

n Number

t Tons

kt Thousands of tons

ab Inhabitants

kg Kilograms

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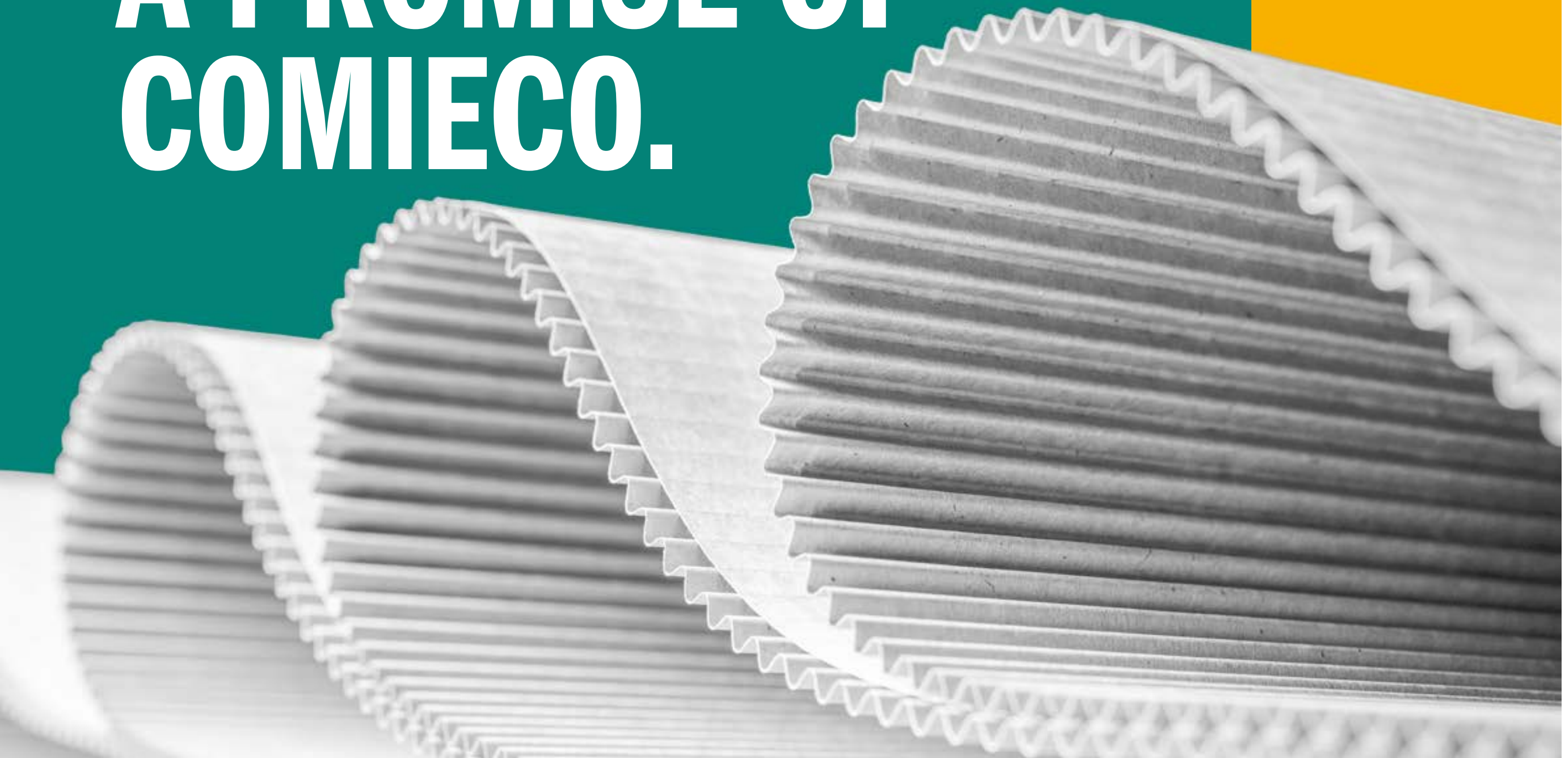
PAPER IS RECYCLED AND COMES BACK TO LIFE. A PROMISE OF COMIECO.



PREFACE
AMELIO CECCHINI
CHAIRMAN, COMIECO

The present time will be mentioned in history books and will remain in our memory forever. The year 2020 caught the whole world by surprise and is forcing people to review models and programmes for the next few months and years.

Comieco turns 35 this year; it is the age of maturity, an important anniversary for the history of separate paper and board collection and recycling. The figures on the following pages provide a clear overview of a conscious, mature, and crucial pipeline.
We had decided to celebrate this anniversary with lots of physical events to thank all the players – citizens, institutions, associations, companies – that ensure, with us, that more and more paper and board be collected and recycled every year. While meetings and hand-shakes are just postponed, in the meantime the Consortium will be closely committed to support and improve all the steps of the recycling pipeline.
Italy's DNA is pervaded with pride and determination, particularly at difficult times, as shown also during the Covid-19 pandemic.

The fifth round of ANCI-CONAI Agreements was, in fact, signed and launched, and will continue until 2025.

Paper was the first material to define the new Technical Annex: this was a very positive achievement in consideration of current conditions, and ensuring full operation at national and local level was also an excellent result. Preliminary data for the first six months of 2020 points out to a decline of around 10% - with special impact on the months of April and May - which will be responsible for discontinuity also on an annual basis. This decline will appear in the expected historical data sets, and is likely to be reduced as early as in the next few weeks, and made up for by next year.

With specific reference to this 25th report on separate paper and board collection in Italy, I am happy to introduce you to the reading of data describing the year 2019 and updating the historical data sets of more than twenty years, starting from the Country's overall performance.

> ***"Comieco turns 35 this year; an age of maturity, an important anniversary".***

A total of over 3.5 million tons of paper and board were collected separately in 2019, thus adding over 100thousand tons to separate collection; two thirds of these new volumes come from the South, where the commitment of the Administrations is consolidated and the profits from the investments made in the past few years are collected. Fifty-eight percent – just more than 2 million tons – of all the paper and board collected separately by the Italian Cities was managed under agreements with Comieco.
Investments aimed at the Cities and operators to support separate collection under the agreements totalled close to 130 million EUR. As mentioned,

**Note: the Rome Colosseum weighs an estimated 0.25 million tons*

2019 saw the closing of the 4th ANCI-CONAI Agreement (2014-2019) and conclusions could be drawn to create a shared basis for the work of the delegations in charge of renewing the Technical Annex for paper and board packaging: since 1998 – the first year of operation of the consortium-based system in Italy – almost 56 million tons of paper and board have been collected by the Cities and recycled, equal to 250 times the weight of the Colosseum.*

Comieco supported this process through the management of 60% of these volumes and the allocation of resources for over 1.7 billion EUR.
In order to meet the challenge posed by the targets of the new European Directive on the Circular Economy, the paper pipeline finds several practical tools in the implementation of the new Paper Technical Annex: the universal assurance of collection and recycling across the entire national territory; growth in terms of economic resources, connected with the quality of the collected material; a renewed commitment with respect to FMS (non-packaging paper) connected with market improvement; market subsidiarity, intended as regulation of private collection and the traceability of the collected material from the City to the paper mill.
All the above adds up to the consolidation of the Italian recycling system, with the implementation of new production capacities of the paper pipeline at Verziolo (Piedmont) and Mantua, which is about to resume production.

> ***"In fact Italy's DNA is pervaded with pride and determination, particularly at difficult times".***

While Italy is proud of ranking first in Europe in terms of recycled paper volumes and of a consolidated 81% recycling rate (anticipating and surpassing the EU targets set for 2025), there are still matters to solve in connection with a new End of Waste regulation and the recovery of non-paper fractions, which are still unduly contained in the volumes collected separately.

The fall of the market prices of paper for recycling, which started in 2018 and continued through 2019, stressed the importance of the Consortium's role

as the guarantor of recycling subsidiary to the market, and under any market condition. For the near future we can expect that the economy will become more and more circular, that a renewed demand-supply balance – albeit with predictable price volatility – will increasingly push the market towards the use of recycled products and the testing of their application in more and more new fields.

"The importance of the Consortium's role was stressed as a guarantor of recycling subsidiary to the market and under any market condition".

Amidst transition towards the European Green New Deal, on the strength of the consolidated results disclosed with this 25th report, I am happy to think that our urban forest – i.e. paper and board for recycling starting from dumpsters and reaching paper mills through the sorting plants – is becoming ever greener, and this is a reason of pride for Italy, a country where raw materials are historically scarce.

EXECUTIVE SUMMARY

CARLO MONTALBETTI

GENERAL MANAGER, COMIECO

The promotion of the paper and board collection, recycling, and recovery culture – a profitable investment. The journey of Comieco started 35 years ago with a very clear mission: promote and support separate paper and board collection across the national territory.
One very satisfactory outcome of this journey is to see, in this 25th annual Report, the positive result of the South as compared to other regions. In this respect, there is a clear improvement in Sicily that, for the fourth year in a row, records a two-digit growth (except in some metropolitan areas).
Thus the South is continuing to pursue its growth with a per-capita yield around 41.8 kg/inhabitant, and contributes, with a 69thousand ton increase, to two-thirds of the additional volumes recorded at national level.

In more general terms, the year 2019 confirmed that separate paper and board collection is by-now a consolidated habit for all the citizens. Municipal paper and board collection in Italy exceeds 3.5 million tons, with a per-capita yield that raises the annual national average to 57.5 kg/inhabitant. The national Report also highlights the ongoing development of separate paper and board collection observed over the past 5 years: an overall 3.0% increase vs. last year, i.e. an additional 100thousand ton volume excluded from landfill disposal; more specifically, this amount equals collection in a region like Marche. A positive trend is observed for the national average and the South, as well as for the Centre, which also records an increase (+2.8%), with the North remaining substantially stable (+0.6%).

The year 2019 and the 2020 trend: packaging reflects the consumer society. Like all the Comieco Reports on paper and board collection, recycling, and recovery in Italy, this 25th edition records and discusses the consolidated results for the preceding year. In this case, however, a reference is due to the current unique historical environment.
The boom of online shopping – which helps account, again in 2019, for the increasing consumption of packaging paper and board as compared to other types of paper – is one of the reasons by which

a gradual increase of the packaging rate in household separate collection was acknowledged in the new CTA (the Paper and Board Packaging Technical Annex): an increase from 40% to 44% is expected, with a subsequent impact on the considerations paid to the Cities for the packaging collected from households alongside the so called FMS (frazioni merceologiche similari, or similar product fractions, including, graphic paper from newspapers, magazines, etc.), which already grew from 34.62 EUR/t to 46.00 EUR/t.

"The year 2019 confirmed that separate paper and board collection is by-now a consolidated habit for all the citizens".

While the assurance of voluntary collection is confirmed for graphic paper too, its economic assessment will change according to market quotations.

What is recycled and how? More than just paper and board: within the framework of the CAC (the Conai Environmental Contribution), the introduction of a separate contribution for paper-based polylaminate packaging fit to contain liquids should be mentioned. This new provision is aimed at improving collection and sorting to obtain a homogeneous flow of waste for dedicated recycling. The result is that dedicated recycling alone recorded an 18% increase, from 4,900 tons in 2018 to 5,800 tons in 2019. As to joint collection with paper and board – which is still the most common collection and recycling mode in Italy – the amount of recycled paper-based polylaminate packaging fit to contain liquids was approximately 18,200 tons. If both approaches are considered, the recycling rate in 2019 is about one-third of apparent consumption.

There is much more than quantity, though: the paper and board recycling pipeline is also focused on high quality. No effective recycling can take place without the painstaking commitment of citizens and other users, a timely and accurate waste collection service by the operator or the City, and a monitoring system.

Whatever happens at this stage can either jeopardize or facilitate all the following steps; this is why the new CTA focuses on the traceability of conferment from the City to the paper mill.

More specifically, with respect to "household collection," the national average shows a very important result in 2019: after three years of non-compliance with thresholds, the average data about the presence of non-paper fractions is below 3.0% and falls within the standards set for the first quality bracket. However, the national figure should be split up and the behaviour of the individual macro-areas should be reviewed: the North continues to growth despite starting from the best national figure, whereas the Centre and South record a general positive trend, yet still surpassing the quality threshold specified in the CTA, and some metropolitan areas are still under observation.

The Cities under the agreements, the system, the economy. As a pipeline Consortium within the Conai System, since the enactment of the Ronchi Decree (Legislative Decree No. 22/97) Comieco has been a guarantor of paper and board recycling, supporting the development of separate collection across Italy with over 1.77 billion EUR allocations to the Cities under the agreements (129.2 million EUR in 2019 alone) with respect to the management of 33 million tons.

"Municipal collection increased more than threefold in just more than 20 years and today Italy is an actual exporter of paper for recycling".

In 1998, one million tons of paper and board were collected separately in Italy, i.e. 17 kg/inhabitant, and industry was forced to import huge volumes to obtain secondary raw materials for recycling. In just more than 20 years, municipal collection increased more than threefold and today Italy is an actual exporter of paper for recycling. The amounts managed under the agreements themselves testify to the increase of household collection volumes.

The price decline in 2019, largely due to the limits to imports in China, encouraged several Cities that used to manage their own collection on the market to re-enter into the agreements and to rely on the Consortium's assurance of collection, a trend that continued in 2020.

While in 2019, with 1,012 agreements in place, Comieco took charge of recycling more than 2 million tons (58% of municipal separate collection vs. 43% in 2019), 500thousand tons of additional volumes under the agreements are expected in 2020, particularly in the Centre and in the North. This confirms the subsidiary role of the Consortium with respect to the market, ensuring the Cities that the materials are collected across the national territory even where market profitability is low. The impact of the new volumes translates into growing local economic contributions, and encourages the Consortium to amend the Conai Environmental Contribution (known as CAC).

Recycling is rewarding. The shift is confirmed in 2019 from a system focused on the so-called IN agreements, where the Cities are only involved in collecting materials that are transferred to Comieco at the entrance to the sorting plant, to a system where today the so-called OUT agreements prevail (now 60%), by which the party under the agreement is also in charge of processing the collected materials. In OUT agreements, Comieco remunerates collection, as well as sorting and processing aimed at the production of the secondary raw material intended for paper mills. This particular service was worth more than 33 million EUR in 2019.

“Comieco is still closely committed to quality”.

In quantitative terms, growth is evident. The average rate of separate paper and board collection vs. the total amount of urban waste is now 11.6%. By raising this index to 12.5%, the yield per inhabitant would increase to 62 kg/year, i.e. 270,000 more tons of separate paper and board collection per year: this is a target that can be achieved in practice in the short term, subject to the inevitable waste reduction that will be recorded in the next few months. However, the more ambitious target is 13%, which would mean a 400,000 ton increase and a per-capita yield above 65 kg/ab, with a positive economic impact on the entire circular system.

Quality for recycling – a challenge for the future. Comieco is still closely committed to quality. In 2019, an accurate and timely product analysis and audit plan allowed to monitor all the crucial steps of the pipeline. The Consortium, alongside sorting operators and paper mills, designed shared procedures to ensure compliance with harmonized EU product standards.

There are expectations about the issuing of the End of Waste regulation – also demanded and promoted by the pipeline – which is crucial for the paper sector, a driver of the Italian circular economy that constantly aims at improving quality to increase recycling.

The recent agreement signed with ANCI follows on this wake. Monitoring activities provided basic information shared during negotiations. The new Technical Annex confirmed such strengths as the market subsidiarity of the consortium system and the assurance of collection across the country, and strengthened the resources intended for the improvement of paper and board packaging, which turned out vital particularly during the recent pandemic-related health crisis.

About 57% of domestic paper production occurs from recycled fibres, a driver for the Italian circular economy.

Packaging recycling – approaching the target. The 2025 paper and board recycling targets provided for by the European directive are virtually already met and surpassed. This positive performance will help the sector hit the 85% target set for 2030. Surely enough, on the strength of the process followed this far and of the developed experience, we will continue our work with growing motivation and dedication.

+102 th. t

VS. 2018

3.5 million t

MUNICIPAL PAPER AND BOARD COLLECTION VOLUME

SEPARATE PAPER AND BOARD COLLECTION IN ITALY – THE STATE OF THE ART

2019: GROWTH RECORDED ACROSS ITALY

Over 100thousand more tons were collected vs. 2018, equal to the volume collected in an entire region such as Marche. For the first time in 2019, the 3.5 million t paper and board collection and recycling threshold was surpassed, with a 3% increase vs. the past year and almost two and a half times as much as in 1998.

This means that each citizen contributed by increasing their per-capita collection by one kilogram, growing from 55.8 kg in 2018 to 57.5 kg last year.
The South accounts for two-thirds of such increase (+69thousand tons, i.e. +8.5%), a predictable result according to the trends of the past few years, whereas the Centre (+23thousand tons, i.e. +2.8%) and the North (+11thousand tons, i.e. +0.6%) show a more limited increase, even below expectations, probably due to a weak growth in Rome and to raw material market conditions.

Growth in the South shows a few important features. For the first time in absolute terms, the collected volumes (874thousand tons) are greater than in the Centre. This arouses important questions about the logistic support required, now and in the future, to ensure that the material collected by the citizens can be recycled. In fact, the per-capita figure is still below the national average, but will continue to grow providing a crucial input to the achievement of national recycling targets..

57.5kg

PER-CAPITA AVERAGE COLLECTION IN ITALY

Investments in the South, also supported by Comieco – with the special projects provided for by the Plan for the South and the equipment Tenders – are proving effective and help all the concerned regions improve their collection yields.

> *"The increase of paper and board collection has contributed to overall separate collection".*

In addition to the results for Sicily (+15.9%) and Molise (+12.5%), which recorded two-digit growth rates, Campania and Puglia deserve special mentioning. For the first time, in fact, they surpassed the 200thousand ton threshold within one year.

These two regions, alongside Sicily, are expected to contribute with the largest share of new collection over the next few years. The 2.8% increase recorded in the Centre is the result of multiple factors. Tuscany, in particular (+13thousand tons) accounts for over half of the additional volumes of the area, and is confirmed as the heart of paper and board recycling in Italy.

While Umbria and Marche record limited growth, the remainder is concentrated in Latium, where a larger contribution was expected from the city of Rome that, on the other hand, after a leap forward in 2013, has remained quite stable for some time around 240/245thousand tons per year, a value that leaves room for further significant growth.

Approximately 11thousand tons come from the North (+0.6%): all the regions show limited percent changes, which should be interpreted as physiological fluctuations in a macroeconomic environment that is difficult to interpret.

An increase close to 3% is reported in Piedmont, vs. a two percent decline in Emilia-Romagna – a region that remains anyway the national leader, with a per-capita collection of over 85 kg/ab – probably attributable to local operating and service adjustments.

85.2 kg/ab

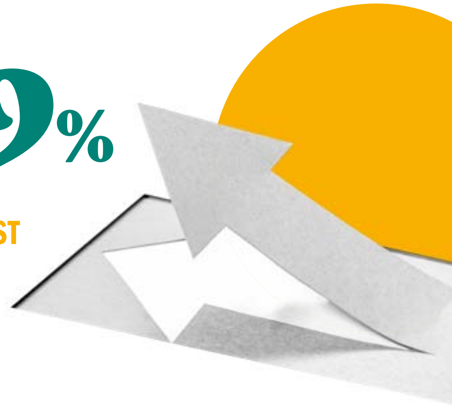
REGION WITH THE BEST PER-CAPITA FIGURE EMILIA ROMAGNA

The increase of paper and board collection has contributed to separate collection in general. A nation-wide review of the ISPRA 2018 data (the latest available) shows that urban waste production has remained substantially unchanged (+2% vs. 2017), whereas the overall municipal separate collection rate increased by over one million tons to 58.2%.
The number of regions that hit and surpassed the 65% municipal separate collection target provided for by the rules increased vs. 2017 (from 2 to 7) (a result that was already consolidated in the North last year). In terms of volumes, organic waste makes the difference (approx. 7 million tons), followed by paper and board, which account for 19.5% (3.4 million tons).

With respect to Italy as a whole, the ratio of paper and board collection to total urban waste collection is 11.3%, a figure that points out to a significant still untapped growth potential. The performance of regions and macro-areas will be described through an analysis of the ratio of total waste production to total separate collection of paper alone: this point of view changes the ranking, that sees citizens in Trentino-Alto Adige at the top with over 15% of paper sorted out from urban waste.

+15.9%

REGION WITH THE SHARPEST INCREASE: SICILY



+8.5% **STRONG GROWTH IN THE SOUTH**

Emilia-Romagna and Abruzzo are struggling for the second place in this competition on paper sorting from total urban waste, both close to 13.5%.
If a focus were made on separate paper and board collection alone, the winner would be Emilia-Romagna (88.7 kg/ab-year, the best performance), with Tuscany (79.9) and Vallée d'Aoste (78.3) second and third respectively.
These three Regions collect on average more than 80 kg/ab, i.e. 50% more than the national per-capita rate. For the first time, Trentino Alto-Adige is not among the top three (77.1). At the bottom, Sicily outperforms Molise that, while growing, stops at 25.7 kg.

The ISPRA data allows to make general projections on 2019. Overall urban waste production is stable at 30 million tons (+0.5%), with separate collection expected to exceed 60% for the first time. While this result comes a few years too late, it shows that the different approach to urban waste management – regulated and implemented at the end of the past century – has turned out strategic by directing the national recycling system towards the Circular Economy, which will be at the basis of decisions over the next few years.
An additional effort, based on the available data, also allows to make preliminary, albeit difficult estimates for 2020. The lockdown enforced to cope with the pandemic reduced consumptions and waste production with an impact also on separate paper and board collection, which is likely to slow down by an estimated 5% by the end of the year. Such decline will concern the Centre-North, whereas growth is still expected in the South, albeit at lower rates than recorded in the last few months. The result will be a return to 2018 values, which will call for monitoring and support of recovery in the near future.

TABLE 1
MUNICIPAL SEPARATE PAPER AND BOARD COLLECTION BY REGIONS. YEARS 2018-2019.

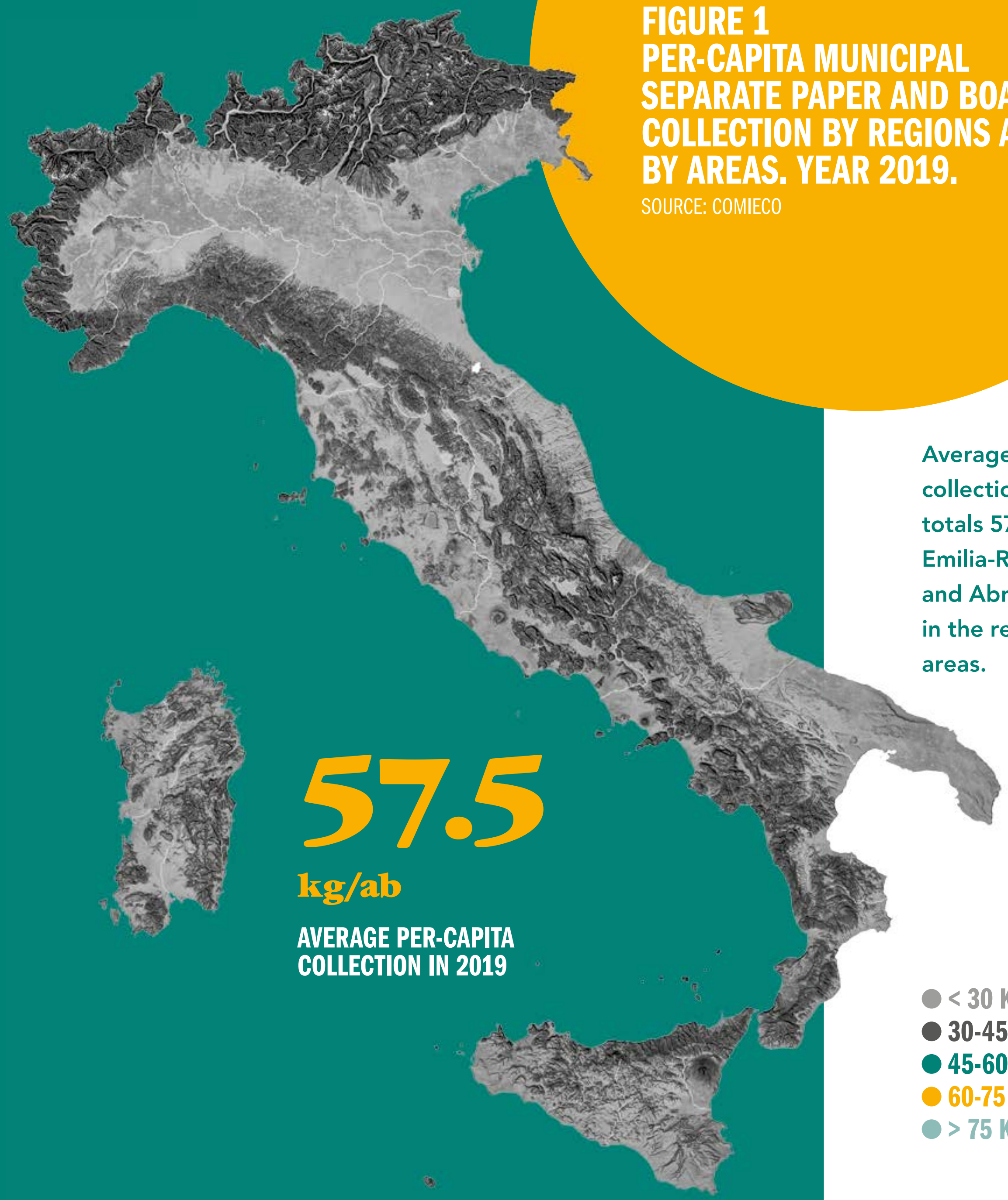
SOURCE: COMIECO

In 2019 the macro-areas continue to follow the trend of the past 3 years. The South stands out with an 8.5% increase compared to 2018, and thus accounts for two-thirds of additional volumes.

Region	SC of paper 2018	SC of paper 2019	Δ 2018/19	Δ 2018/19
	t	t	t	%
Piedmont	282,018	290,301	8,283	2.9
Vallée d'Aoste	9,836	9,813	-23	-0.2
Lombardy	563,063	567,954	4,891	0.9
Trentino-Alto Adige	81,688	83,045	1,357	1.7
Veneto	295,831	300,516	4,685	1.6
Friuli-Venezia Giulia	70,203	71,031	828	1.2
Liguria	87,856	88,122	266	0.3
Emilia-Romagna	395,740	386,427	-9,313	-2.4
North	**1,786,235**	**1,797,209**	**10,974**	**0.6**
Tuscany	297,183	310,324	13,141	4.4
Umbria	58,219	59,086	867	1.5
Marche	103,957	104,000	43	0.0
Latium	359,646	368,305	8,659	2.4
Centre	**819,005**	**841,715**	**22,710**	**2.8**
Abruzzo	80,043	83,489	3,446	4.3
Molise	7,626	8,580	954	12.5
Campania	189,517	200,588	11,071	5.8
Puglia	189,449	204,529	15,080	8.0
Basilicata	24,181	26,155	1,974	8.2
Calabria	83,135	90,825	7,690	9.3
Sicily	140,423	162,689	22,266	15.9
Sardinia	90,701	96,831	6,130	6.8
South	**805,075**	**873,686**	**68,611**	**8.5**
Italy	**3,410,315**	**3,512,610**	**102,295**	**3.0**

Note: adjusted based on 2018 data for Vallée D'Aoste, Piedmont, Lombardy, Trentino-Alto Adige, Tuscany, Marche, Latium, Abruzzo, Campania, Puglia, Sicily, and the corresponding macro-areas.

FIGURE 1
PER-CAPITA MUNICIPAL SEPARATE PAPER AND BOARD COLLECTION BY REGIONS AND BY AREAS. YEAR 2019.
SOURCE: COMIECO



57.5
kg/ab
AVERAGE PER-CAPITA COLLECTION IN 2019

Average per-capita collection in 2019 in Italy totals 57.5 kg/ab. Emilia-Romagna, Tuscany, and Abruzzo rank first in the respective macro-areas.

- < 30 KG/AB YEAR
- 30-45 KG/AB YEAR
- 45-60 KG/AB YEAR
- 60-75 KG/AB YEAR
- > 75 KG/AB YEAR

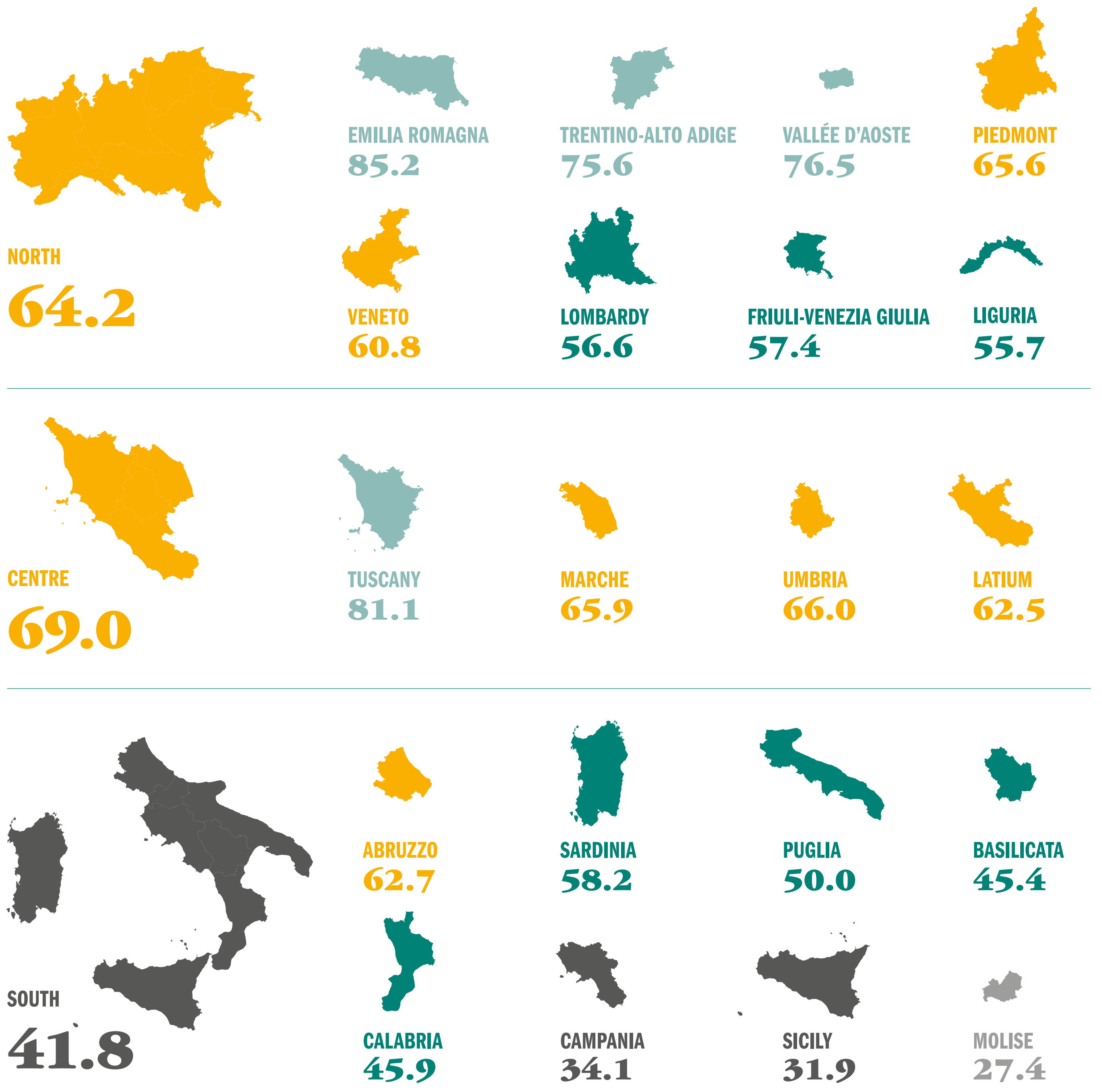
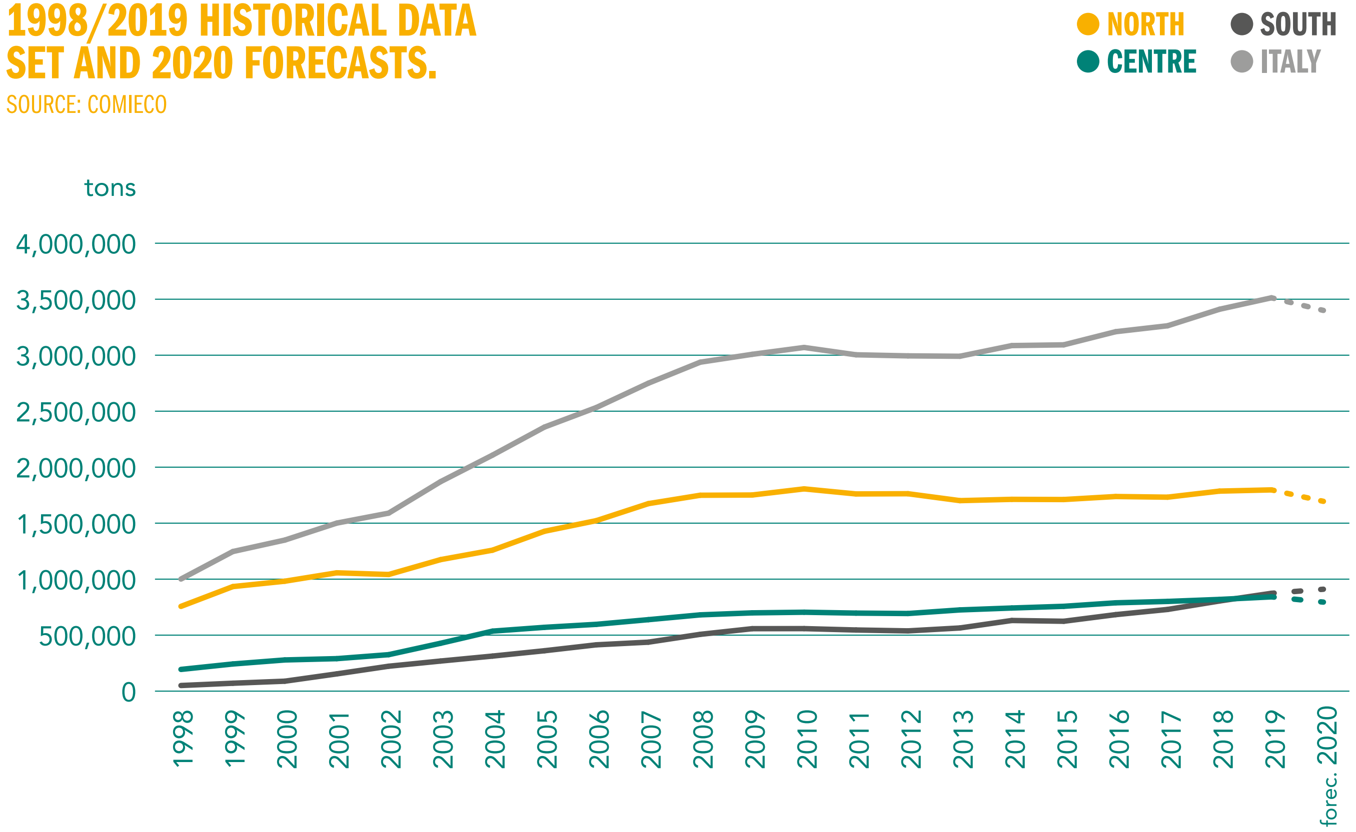


FIGURE 2
MUNICIPAL SEPARATE PAPER AND BOARD COLLECTION. 1998/2019 HISTORICAL DATA SET AND 2020 FORECASTS.

SOURCE: COMIECO



	1998	2019	2020 forecast	Δ 2019-2020 forecast	Δ 1998-2019
	t	t	t	t	%
North	756,813	1,797,209	1,695,000	-102,209	124
Centre	193,958	841,715	795,000	-46,715	310
South	50,222	873,686	910,000	36,314	1,712
Italy	1,000,993	3,512,610	3,400,000	-112,610	240

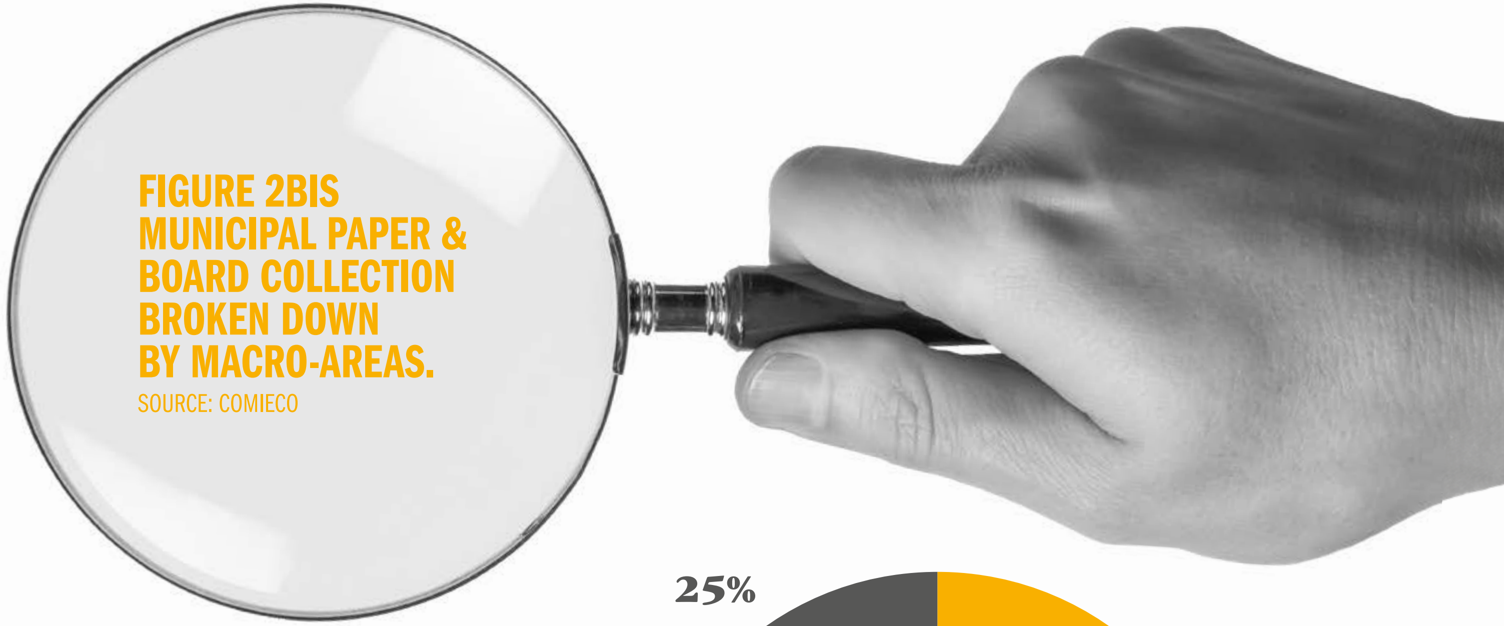
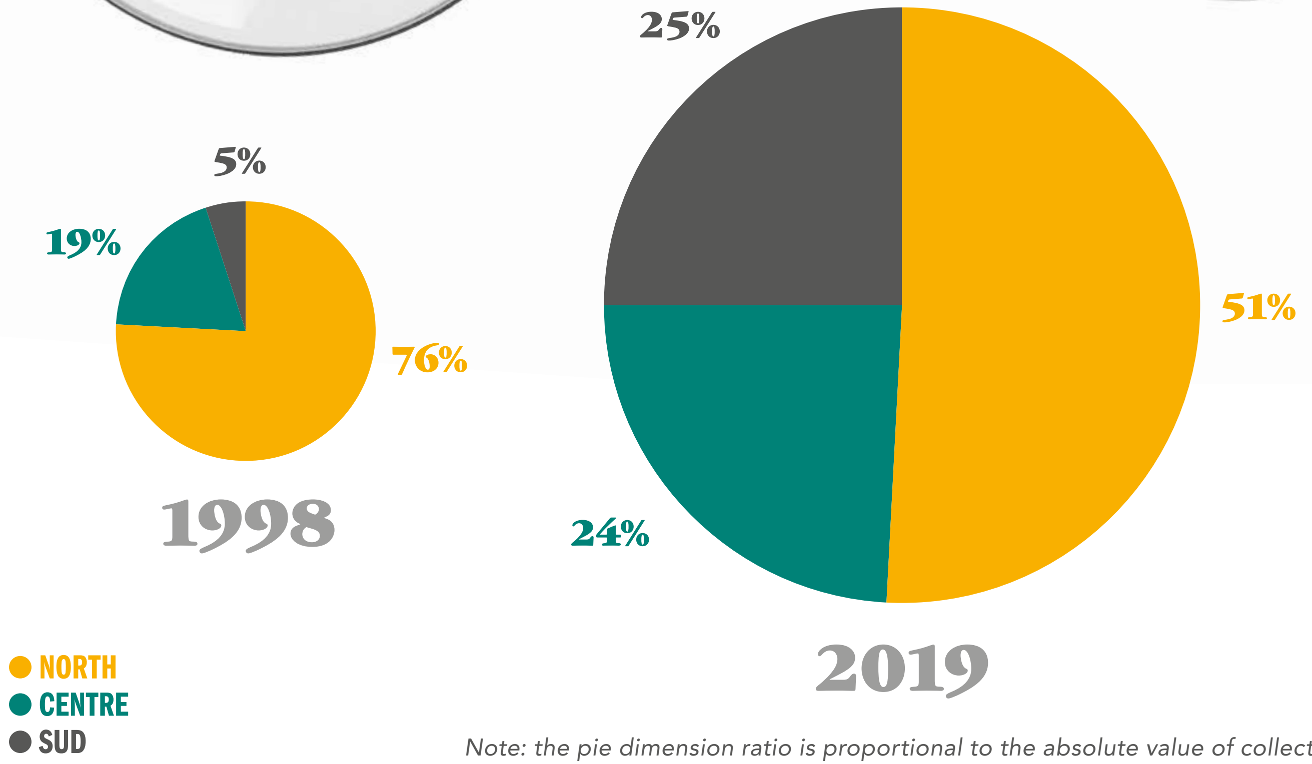


FIGURE 2BIS
MUNICIPAL PAPER & BOARD COLLECTION BROKEN DOWN BY MACRO-AREAS.

SOURCE: COMIECO



Note: the pie dimension ratio is proportional to the absolute value of collection.

TABLE 2
THE RATIO OF SEPARATE PAPER AND BOARD COLLECTION TO TOTAL URBAN WASTE.

SOURCE: ISPRA 2018 DATA PROCESSED BY COMIECO

The ratio of paper to urban waste collection and the amount of the remaining waste, alongside the per-capita value, improve understanding of the actual development of the separate collection service. In this table, the Regions and the macro-areas are shown in decreasing order with respect to the ratio of separate paper collection to total urban waste.

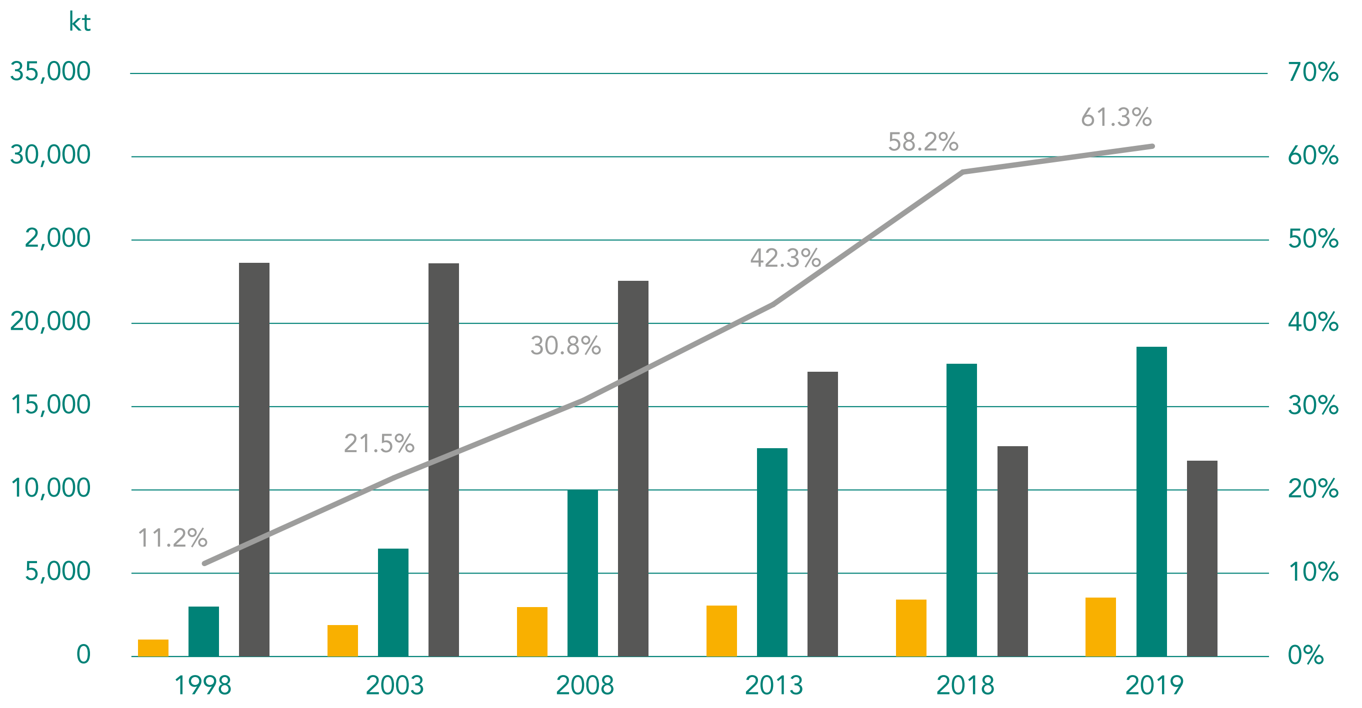
	Inhabitants	Total UW	Total SC	Total SC	SC of paper	Mixed UW	SC of paper vs. tot. UW
	n	kg/ab	kg/ab	%	kg/ab	kg/ab	%
North	27,746,113	516.8	349.9	67.7	64.5	166.9	12.5
Centre	12,016,009	547.8	297.5	54.3	68.3	250.2	12.5
South	20,597,424	448.8	207.1	46.1	39.3	241.7	8.8
Italy	**60,359,546**	**499.7**	**290.7**	**58.2**	**56.6**	**209.0**	**11.3**

- UP TO 150 KG/AB-YEAR
- 150-200 KG/AB-YEAR
- 200-250 KG/AB-YEAR
- 250-300 KG/AB-YEAR
- MORE THAN 300 KG/AB-YEAR

Region	Inhabitants	Total UW	Total SC	Total SC	SC of paper	Mixed UW	SC of paper vs. tot. UW
	n	kg/ab	kg/ab	%	kg/ab	kg/ab	%
Trentino-Alto Adige	1,072,276	505.7	366.5	72.5	77.1	139.2	15.2
Emilia-Romagna	4,459,477	660.5	444.3	67.3	88.7	216.2	13.4
Abruzzo	1,311,580	460.2	274.4	59.6	61.6	185.8	13.4
Vallée d'Aoste	125,666	597.3	371.9	62.3	78.3	225.3	13.1
Piedmont	4,356,406	497.7	305.1	61.3	64.9	192.6	13.0
Tuscany	3,729,641	612.4	343.6	56.1	79.9	268.9	13.0
Marche	1,525,271	531.1	364.3	68.6	68.3	166.8	12.9
Umbria	882,015	522.0	330.9	63.4	66.6	191.1	12.8
Veneto	4,905,854	481.7	355.3	73.8	60.3	126.4	12.5
Basilicata	562,869	354.3	167.4	47.3	43.4	186.9	12.3
Sardinia	1,639,591	457.4	306.6	67.0	55.3	150.8	12.1
Latium	5,879,082	514.9	246.0	47.8	61.2	268.9	11.9
Lombardy	10,060,574	478.2	338.1	70.7	56.0	140.1	11.7
Friuli-Venezia Giulia	1,215,220	494.8	329.5	66.6	57.8	165.2	11.7
Calabria	1,947,131	403.4	182.5	45.2	42.9	220.9	10.6
Liguria	1,550,640	536.8	266.5	49.6	56.6	270.3	10.6
Puglia	4,029,053	470.9	213.8	45.4	47.3	257.1	10.1
Campania	5,801,692	448.6	236.2	52.7	32.7	212.4	7.3
Molise	305,617	380.8	146.2	38.4	25.7	234.6	6.7
Sicily	4,999,891	457.9	135.2	29.5	28.3	322.7	6.2

FIGURE 3
COMPARISON OF URBAN WASTE PRODUCTION, TOTAL SEPARATE COLLECTION, AND MUNICIPAL SEPARATE PAPER AND BOARD COLLECTION IN ITALY. 1998-2019 DATA SET.

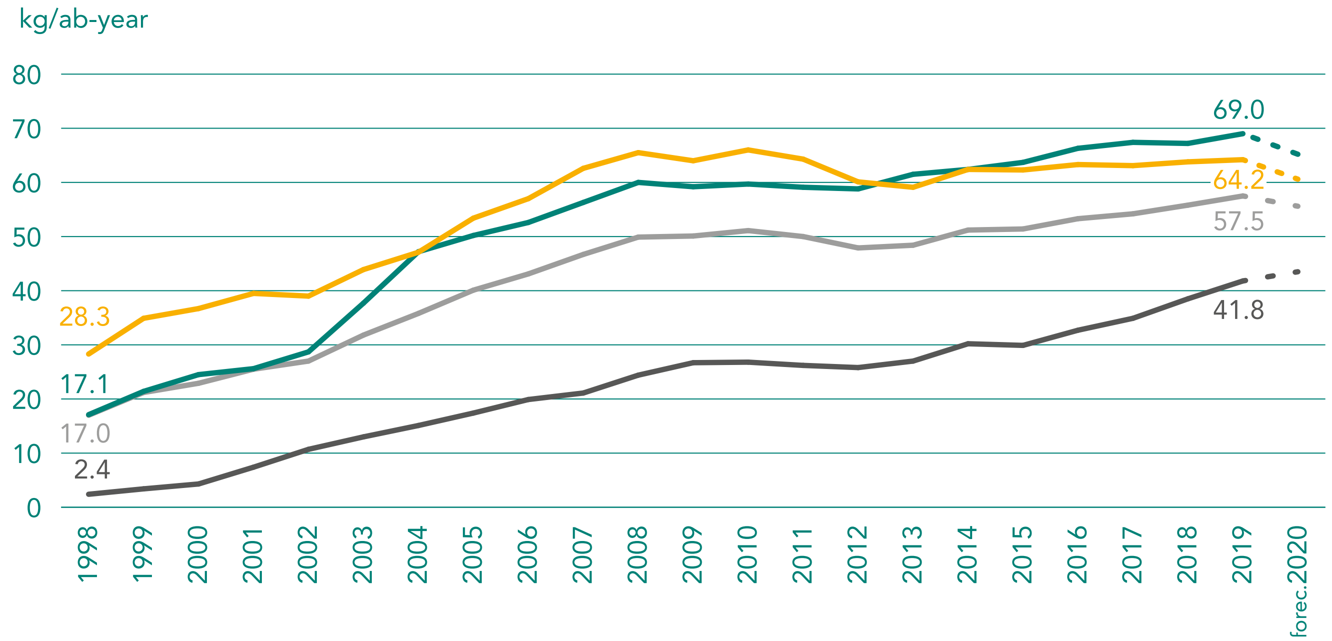
SOURCE: COMIECO



	1998	2018	2019	Δ 2018/2019	Δ 1998/2019	
	kg/ab-year	kg/ab-year	kg/ab-year	kg/ab-year	kg/ab-year	%
North	28.3	63.8	64.2	0.4	35.9	126.9
Centre	17.1	67.2	69.0	1.9	51.9	303.8
South	2.4	38.5	41.8	3.3	39.4	1,639.8
Italy	17.0	55.8	57.5	1.7	40.5	238.2

FIGURE 4
PER-CAPITA MUNICIPAL SEPARATE PAPER AND BOARD COLLECTION. 1998-2019 TREND AND 2020 FORECAST.

SOURCE: COMIECO



The South and the metropolitan areas are the main targets, but all the regions still have untapped potentials to a varying extent.

BIG CITIES: COMPLEX SYSTEMS

Metropolitan areas, and regional or provincial capitals in particular, are focus points that deserve some ad-hoc consideration. In the past few editions of the Annual Report, this monitoring has been considering six Italian cities (from North to South: Turin, Milan, Florence, Rome, Naples, and Palermo) that account, together, for almost 12% of inhabitants and approximately 14% of the urban waste produced in Italy. These cities are physiologically complex entities due to an overlap of inhabitants, types and diversity of utilities, urban textures – all factors that contribute to a more complicated organization and management of urban sanitation services. This is confirmed by the data of separate collection, which is above 50% in just two cases – Milan and Florence – vs. an Italian estimated average above 60%.

TOTAL SEPARATE COLLECTION VS. 2018

+2.5%

Overall data for 2019 shows that waste management is constantly improving. A decline is recorded both in overall urban waste production (-0.9%), and in the non-recycled fraction thereof (-3.7%), while separate collection continues to grow (+2.5%).
These aggregated results are a consequence of a lack of homogeneity among the conditions of the six sample cities.

While SC is growing in all of them, only in Turin and Rome is a waste production decline recorded. Florence and Naples have virtually stable indexes vs. last year. The most dynamic city is Palermo that, however, is farthest from an organic development of services, with SC still limited to 14%.
If these six cities are considered as a single urban entity, interesting observations can be made.

TOTAL WASTE VS. 2018

-0.9%

-3.7%

MIXED WASTE VS. 2018

This urban conglomerate has 6.8 million inhabitants that produced just less than 4 million tons of urban waste in 2019, including 1.8 million (45.4%) collected separately. Average urban waste production is 17% higher compared to the domestic figure, which shows that big cities are crucial to the development expected within the next few years, considering that the UW and SC parameters are lower than "Italy's average".

"Data for 2019 shows that waste management is constantly improving".

Paper and board collection in the six cities exceeded 480thousand tons in 2019, i.e. almost 14% of the domestic figure.
This means that more paper and board is collected on average in urban areas due to the abundance of shops and services.

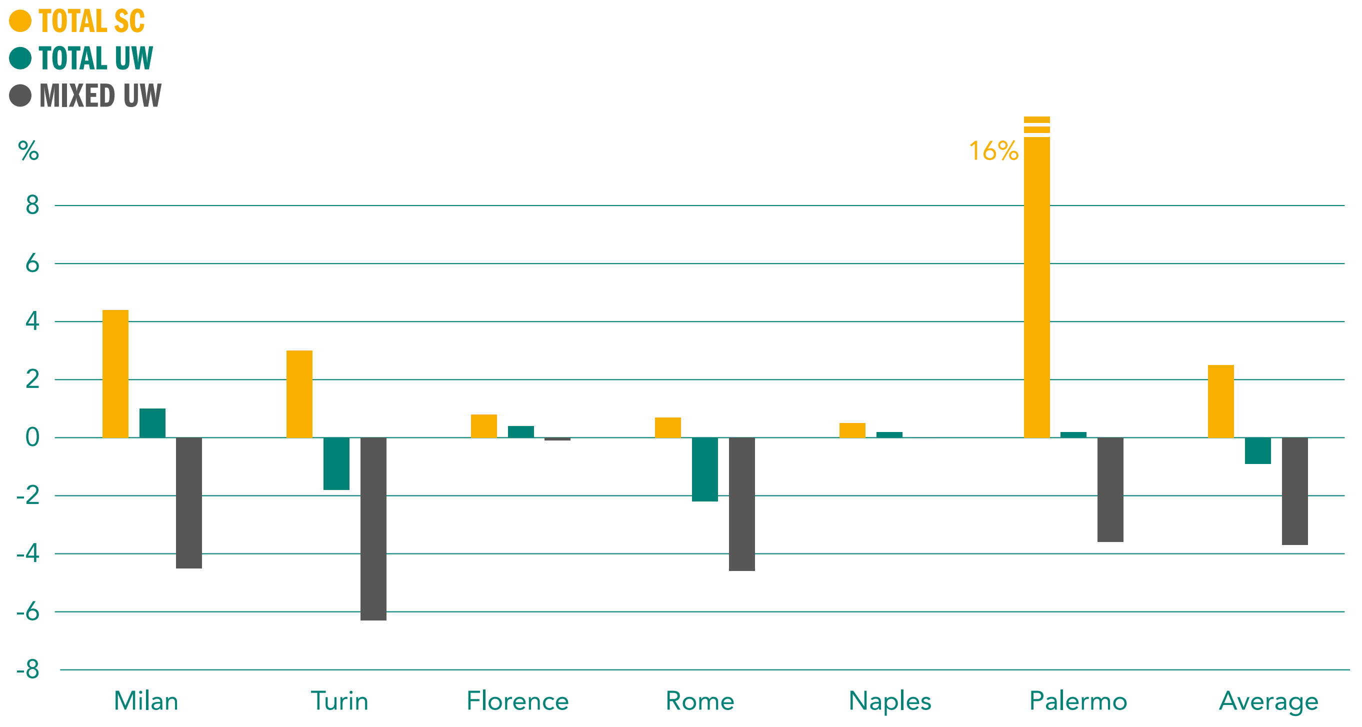
The average per-capita amount is 71 kg/ab, 23% above the average domestic figure. We should not be deceived by this value; these areas still have high potentials, with a possible further 20% growth of collection compared to current values.
In view of summarizing these achievements, it should be noted that cities are part of the revolution under way in urban waste management, but their performance is still slow.

Examples like Milan demonstrate that better results can be achieved and that focusing on large urban areas is crucial to meet the national targets.

The focus on metropolitan areas confirms the national trend. While separate collections are established, mixed waste is decreasing. These areas deserve attention, in that this is where service organization is most difficult, but also where the highest volumes can be achieved.

FIGURE 5
WASTE COLLECTION IN THE SAMPLE CITIES MILAN, TURIN, FLORENCE, ROME, NAPLES, AND PALERMO. YEAR 2019 AND 2018-2019 VARIATIONS.

SOURCE: COMIECO



Δ 2018/2019		Milan	Turin	Florence	Rome	Naples	Palermo	Average
Total SC	%	4.4	3.0	0.8	0.7	0.5	16.0	2.5
Total UW	%	1.0	-1.8	0.4	-2.2	0.2	0.2	-0.9
Mixed UW	%	-4.5	-6.3	-0.1	-4.6	0.0	-3.6	-3.7
2019								**Totale**
Total SC	t	434,152	213,373	132,648	766,453	182,958	73,095	1,802,679
Total UW	t	702,209	442,886	246,698	1,692,050	505,998	380,135	3,969,976
Mixed UW	t	268,057	229,513	114,050	925,597	323,040	307,040	2,167,297
SC/UW	**%**	**61.8**	**48.2**	**53.8**	**45.3**	**36.2**	**14.1**	**45.4**

FIGURE 5BIS
WASTE COLLECTION IN THE SAMPLE CITIES MILAN, TURIN, FLORENCE, ROME, NAPLES, AND PALERMO. YEAR 2019.

SOURCE: COMIECO

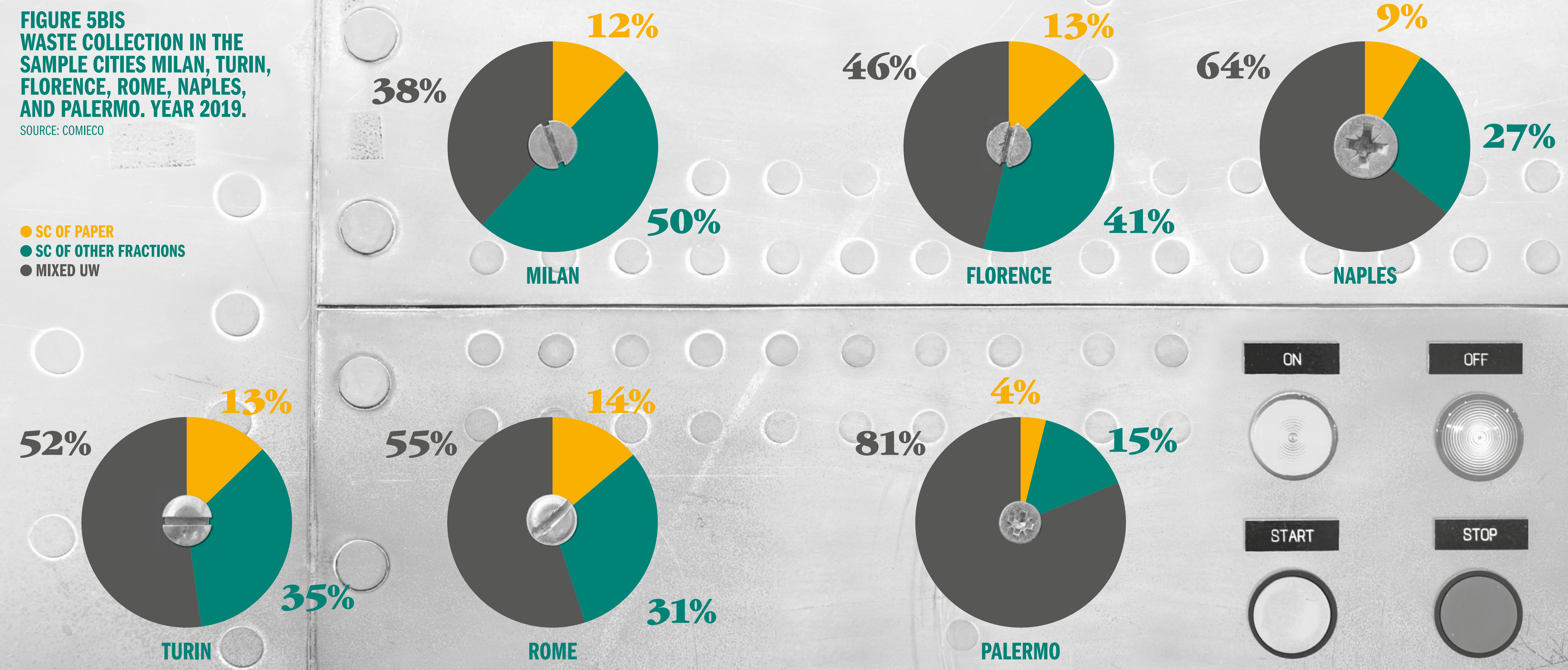
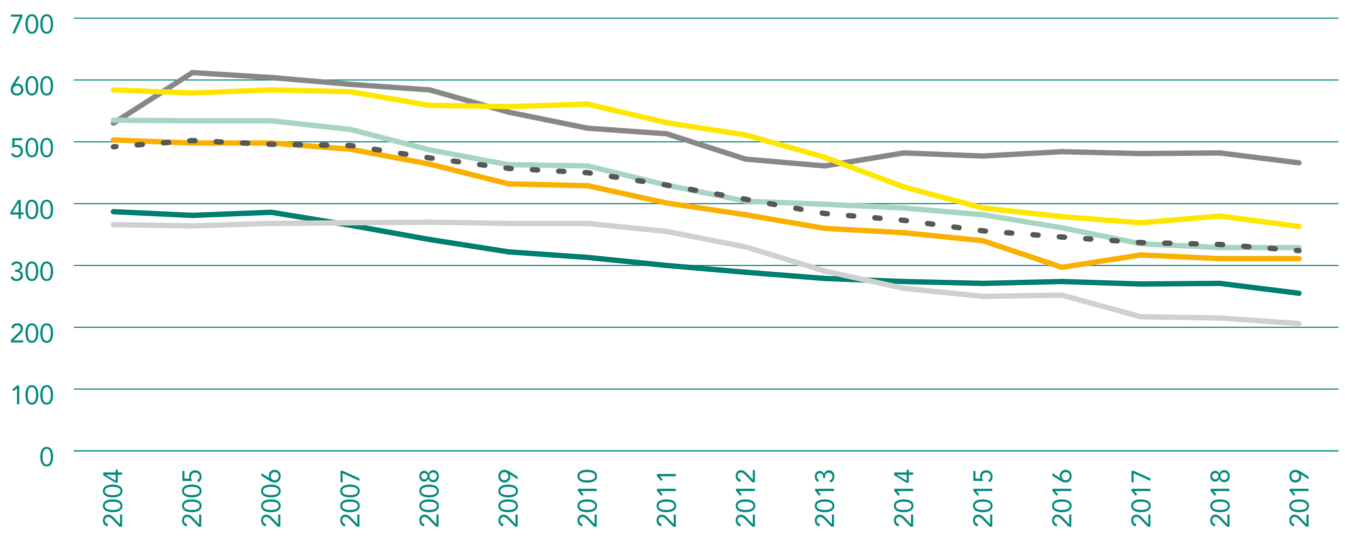


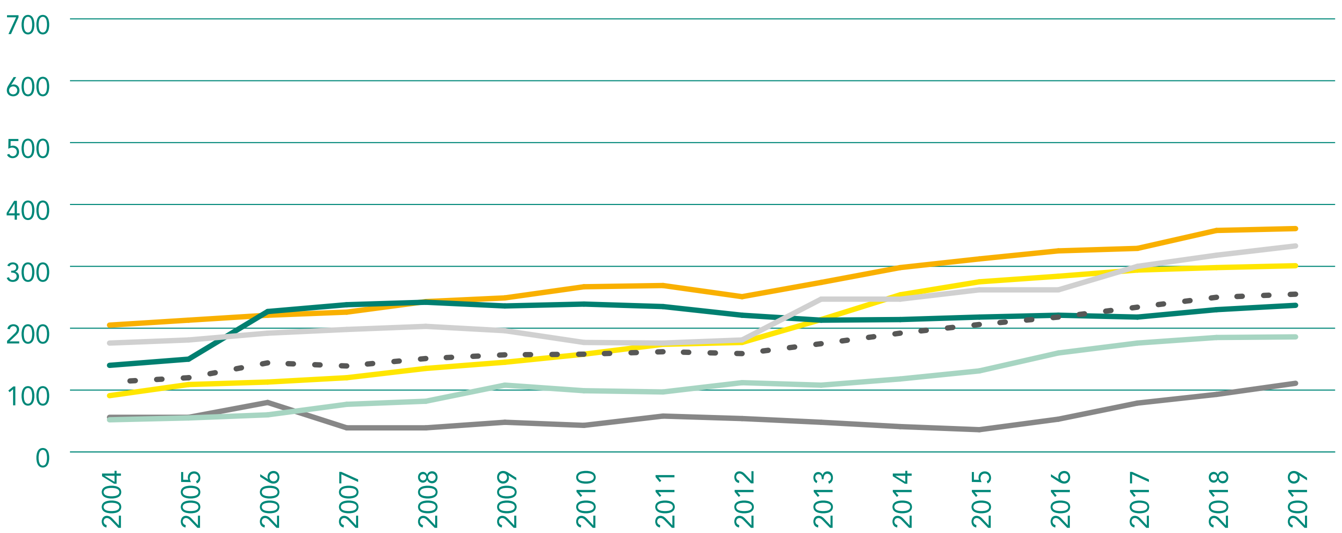
FIGURE 6
WASTE COLLECTION IN THE SAMPLE CITIES MILAN, TURIN, FLORENCE, ROME, NAPLES, AND PALERMO. 2004-2019 PER-CAPITA DATA.

FONTE: COMIECO

MIXED UW

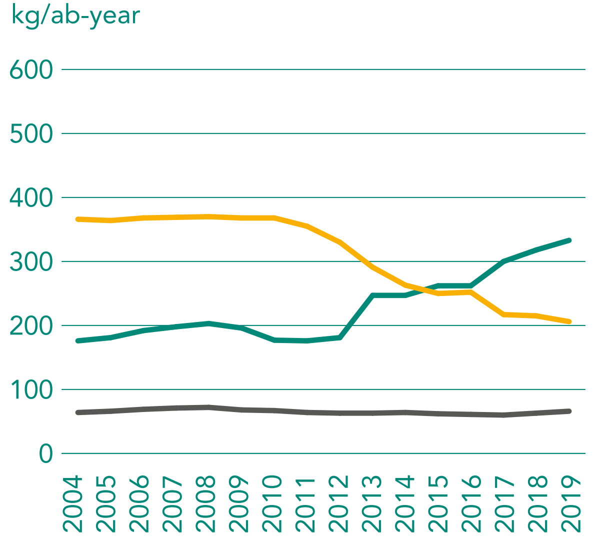


TOTAL SC

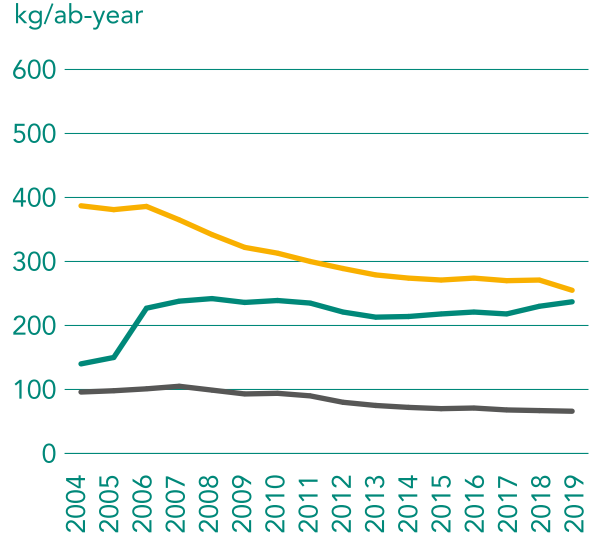


- MILAN
- TURIN
- FLORENCE
- ROME
- PALERMO
- NAPLES
- AVERAGE

MILAN

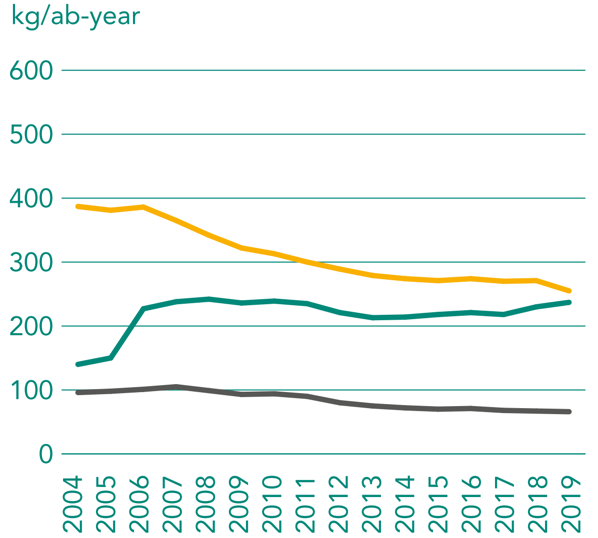


TURIN

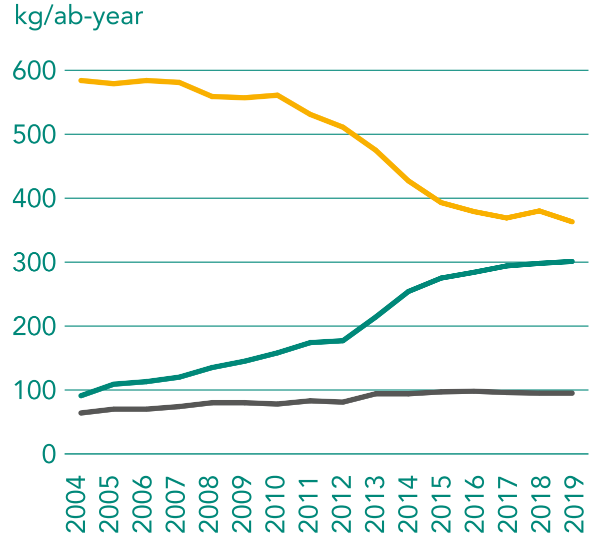


- MIXED UW
- TOTAL SC
- SC OF PAPER & BOARD

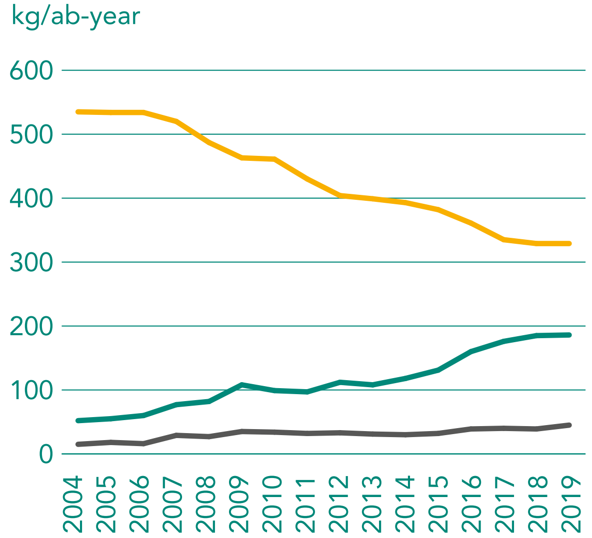
FLORENCE



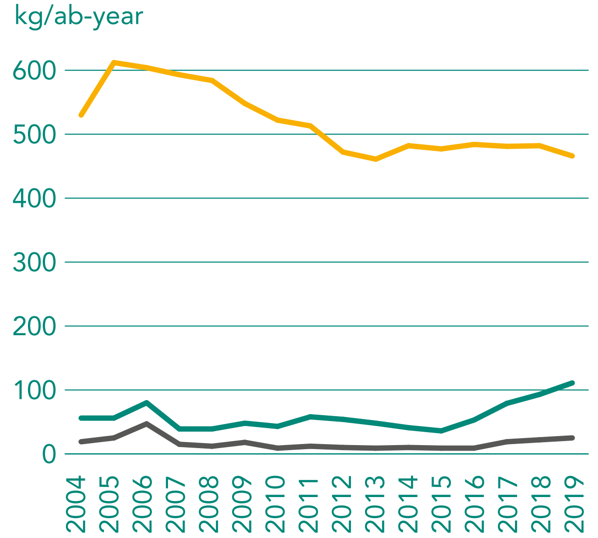
ROME



NAPLES



PALERMO



77.4%

CITIES UNDER THE AGREEMENTS

88.9%

CITIZENS UNDER THE AGREEMENTS

CITIES UNDER THE AGREEMENTS: FIGURES AND RESULTS IN 2019

COLLECTION

One-thousand and twelve agreements were in force as at 31/12/2019, entered into with Comieco either directly or through proxies, representing 6,296 Cities and over 54 million inhabitants.
While the Centre and the North had 87 and 151 agreements in place, respectively, the South had 774. This disproportion confirms how difficult it is to ensure optimal super-municipal operation. This trend has been under way for some time and highlights poor coordination among local entities that do not leverage on "networking," investment optimization, and know how, thus missing the benefits that may derive from scale economies, both upon collecting and upon processing and recycling.
The average amount managed in each agreement in force in Southern Italy is less than 900 t/year, one fifth of the amounts in the Centre and North.

In 2019 the Consortium provided for recycling of 2.04 million tons of paper and board, i.e. 58% of national municipal collection. The managed amounts increased by almost 600thousand tons compared to 2018 (+41,4%).

This trend is a result of the decision of most parties under the agreements to entrust to the Consortium amounts of materials that used to be managed outside the scope of the agreements, due to the possibility offered by the Technical Annex to adjust the relation with Comieco in order to maximize revenues.

2 million t

MANAGED UNDER THE AGREEMENTS, I.E. 58% OF MUNICIPAL PAPER AND BOARD COLLECTION IN ITALY

In particular, 80% of the additional amounts come from 1.01 + 1.02 (490thousand tons), whereas locally the North submits almost 440thousand tons of paper and board from separate collection, including through amendments to the agreements or the execution of new ones, thus contributing to the increase with more than 75% at national level.

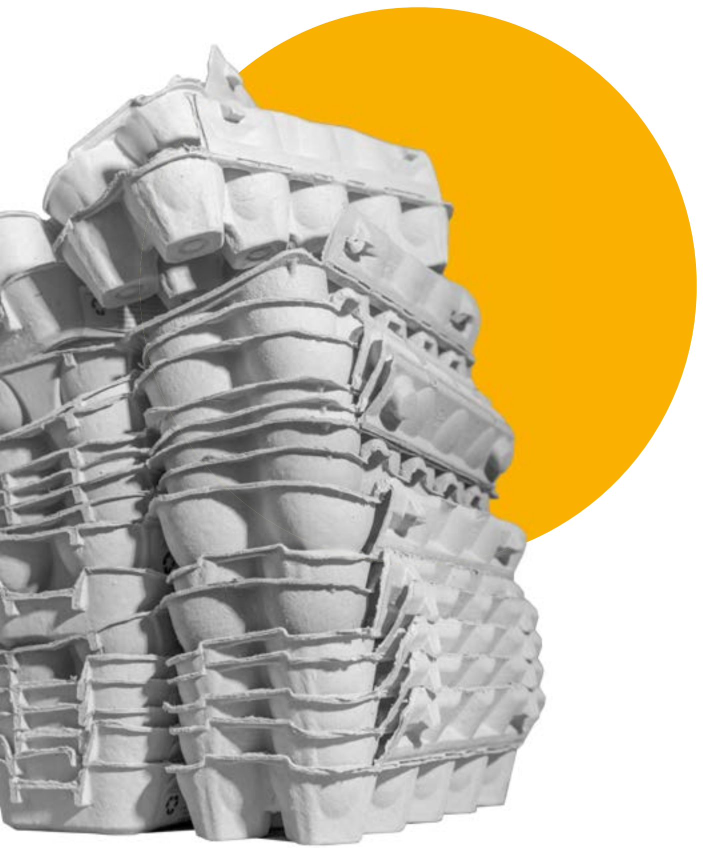
The Consortium confirms its peculiarity as a market-subsidiary party according to local needs, particularly in the Centre and North, where allowed by the environment, whereas in the South Comieco still acts as a promoter of development and recycling. Starting from 2018 – and still today – the price trend of paper for recycling has pointed out to the outstanding role of the Consortium in supporting collection and ensuring recycling in the Cities. More specifically, the Consortium managed 1.27 million tons of packaging (277thousand tons up compared to 2018), and almost doubled the volume of similar product fractions (graphic paper) in the managed mix, which totals more than 767thousand tons (approximately 320thousand tons up compared to 2018).

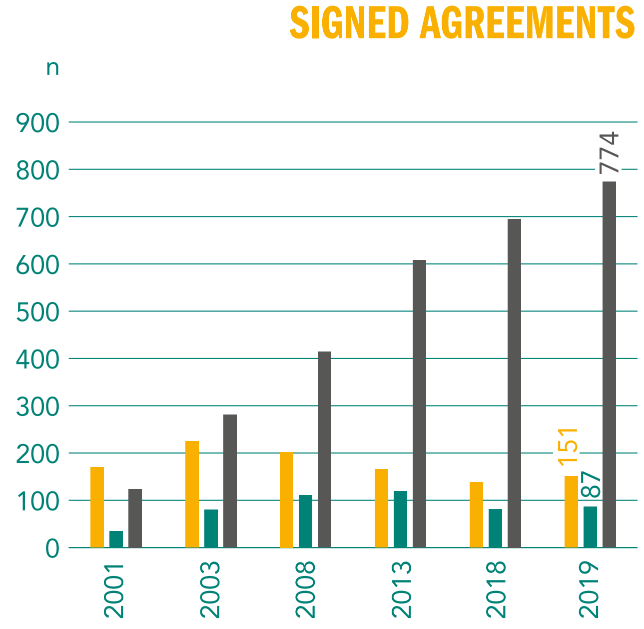
TABLE 3
LOCAL COVERAGE BY REGIONS AS AT DECEMBER 31, 2019.

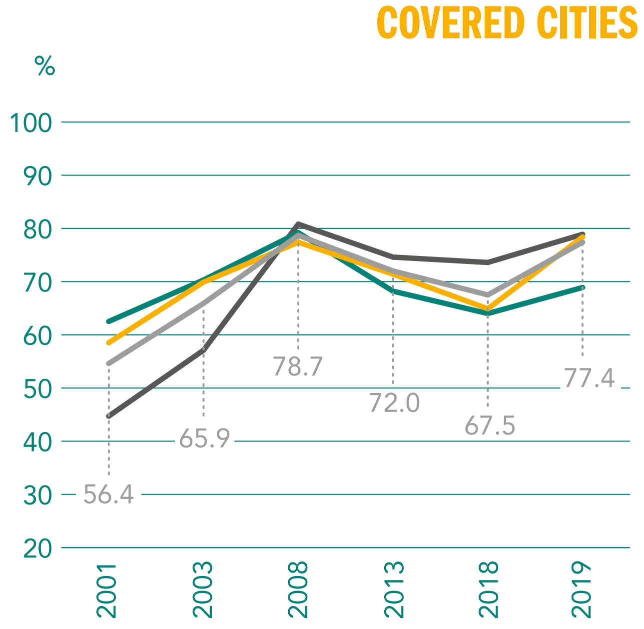
SOURCE: COMIECO

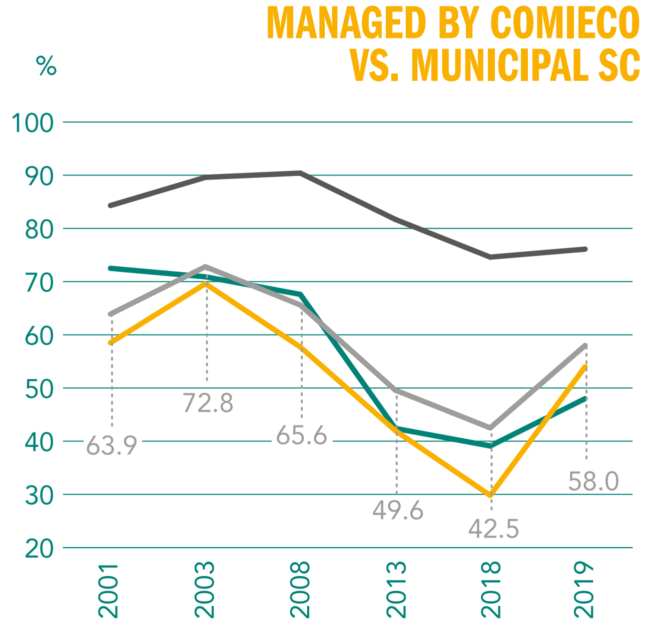
Area	Agreements	Average inhabitants per agreement	Average amount managed under the agreements
	n	n	t
North	151	161,444	6,425
Centre	87	123,886	4,641
South	774	24,763	859
Italia	**1,012**	**53,679**	**2,014**

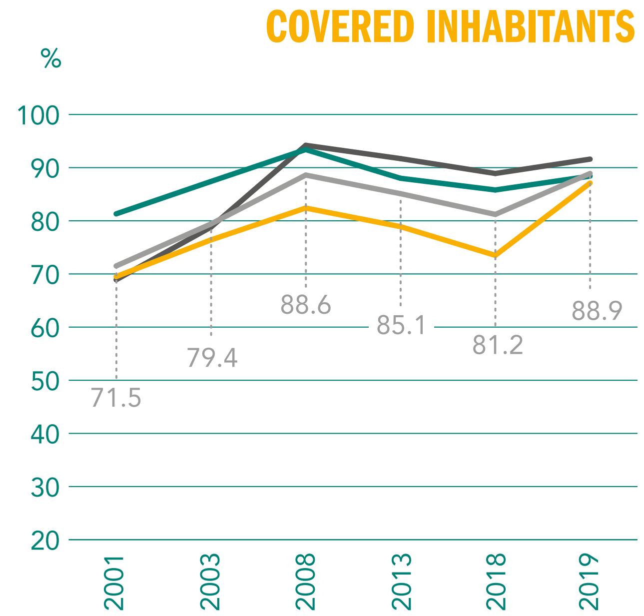
Region	Agreements	Cities under the agreements		Citizens under the agreements		Amount managed under the agreements	
	n	n	%	n	%	t	% vs. total SC of paper
Piedmont	25	1,111	92.0	4,320,691	97.6	168,543	58.1
Vallée d'Aoste	1	74	100.0	128,298	100.0	8,995	91.7
Lombardy	51	900	58.3	7,174,048	71.5	211,915	37.3
Trentino Alto Adige	19	278	79.9	978,672	89.1	53,194	64.1
Veneto	22	530	90.8	4,761,835	96.4	195,215	65.0
Friuli Venezia Giulia	6	212	96.4	1,200,214	97.0	39,158	55.1
Liguria	17	163	69.4	1,428,452	90.2	57,947	65.8
Emilia Romagna	10	317	88.8	4,385,802	96.7	235,157	60.9
North	**151**	**3,585**	**78.4**	**24,378,012**	**87.1**	**970,124**	**54.0**
Tuscany	15	265	90.4	3,627,035	94.8	190,169	61.3
Umbria	10	54	58.7	771,026	86.2	27,246	46.1
Marche	16	199	81.9	1,366,949	86.6	69,552	66.9
Latium	46	175	46.3	5,013,030	85.1	116,785	31.7
Centre	**87**	**693**	**68.9**	**10,778,040**	**88.4**	**403,752**	**48.0**
Abruzzo	27	259	84.9	1,230,399	92.4	63,142	75.6
Molise	15	122	89.7	300,469	95.9	7,637	89.0
Campania	155	407	73.7	5,215,203	88.7	156,361	78.0
Puglia	162	239	92.6	3,993,875	97.6	159,835	78.1
Basilicata	24	98	74.8	488,716	84.8	16,337	62.5
Calabria	66	335	81.9	1,802,421	91.2	53,735	59.2
Sicily	274	363	93.1	4,973,672	97.7	144,854	89.0
Sardinia	51	195	51.7	1,162,183	69.9	62,646	64.7
South	**774**	**2,018**	**78.9**	**19,166,938**	**91.6**	**664,547**	**76.1**
Italy	**1,012**	**6,296**	**77.4**	**54,322,990**	**88.9**	**2,038,423**	**58.0**











The high fragmentation of agreements, still in place in the South, hampers synergic development. Comieco still plays a key role by mitigating market fluctuations and managing additional volumes – consistently with the principle of subsidiarity – up to 58% of the total in 2019. Just less than 600thousand tons of paper and board are covered by the agreements, of which over 76% in the North and over 80% from household collection.

FIGURE 7
STATUS OF THE AGREEMENTS UPON EXPIRATION OF EACH FRAMEWORK AGREEMENT AND COVERAGE RATES OF THE AGREEMENTS. 2001/2019 HISTORICAL DATA SET.

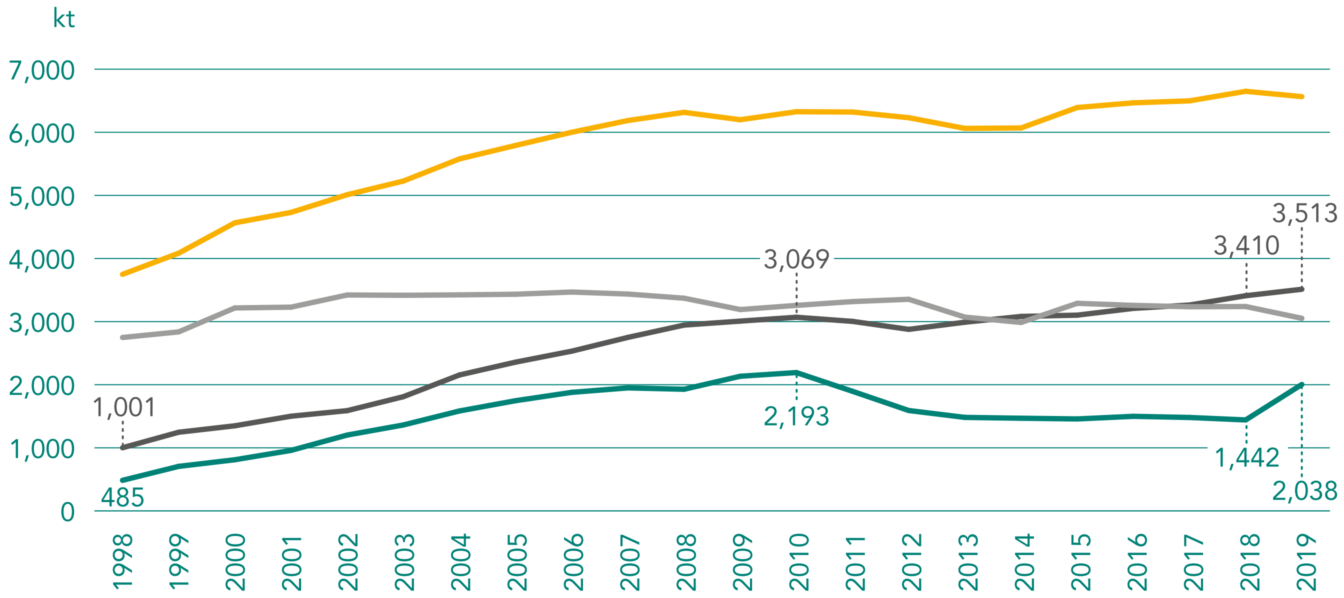
SOURCE: COMIECO

- NORTH
- CENTRE
- SOUTH
- ITALY

FIGURE 8
RATIO OF TOTAL PAPER AND BOARD COLLECTION MANAGED UNDER THE AGREEMENTS TO APPARENT COLLECTION. 2016-2018 HISTORICAL DATA SET AND COMPARISON.

SOURCE: COMIECO

- APPARENT COLLECTION
- MUNICIPAL SC OF PAPER AND BOARD UNDER THE AGREEMENTS
- MUNICIPAL SC OF PAPER AND BOARD
- HOUSEHOLD COLLECTION



		1998	2003	2008	2013	2018	2019	Δ t 1998 /2019	Δ % 1998 /2019	Δ t 2018 /2019	Δ % 2018 /2019
Apparent collection*	kt	3,749	5,227	6,316	6,062	6,649	6,565	2,816	75.1	-86	-1.3
Municipal SC of paper and board	kt	1,001	1,810	2,945	2,991	3,410	3,513	2,512	250.9	103	3.0
Municipal SC of paper and board under the agreements	kt	485	1,362	1,928	1,482	1,442	2,038	1,553	320.3	596	41.3
Household collection	kt	2,748	3,417	3,371	3,071	3,239	3,052	304	11.1	-187	-5.8

Municipal SC of paper and board under the agreements vs. apparent collection	%	12.9	26.1	30.5	24.4	21.7	31.0
Municipal SC of paper and board under the agreements vs. municipal collection	%	48.5	75.2	65.5	49.6	42.3	58.0

Apparent collection: consumption of paper for recycling - imports + exports

ALLOCATIONS TO PARTIES UNDER THE AGREEMENTS

Comieco invested a total of 129 million EUR in 2019 to manage just more than 2 million tons of paper and board collected at municipal level under the agreements.

This includes 119.6 million EUR for packaging and 9.5 for graphic paper. This investment is growing significantly (+32 million EUR vs. 2018) due to the new volumes that the Consortium was asked to take charge of. The managed amount grows by over 40%, with three-quarters of such change recorded in Northern Italy. The impact is on the packaging share (+28%) and, particularly, on the FMS (+72%) with an investment growing by over 4 million EUR.

The average calculated value per inhabitant covered by the agreements also grew from 2.8 EUR/ab in 2018 to 2.4 in 2019.

129.2
million EUR
ALLOCATED TO THE CITIES IN 2019

2.4
euro/ab-year
AVERAGE CONSIDERATION PER INHABITANT

1.77
billion EUR
FROM 1998 TO 2019

This is basically due to two factors:
- an increase of the per-capita yield (particularly in the South);
- an increase of the amount subject to post-sorting management under the so-called OUT agreements, which ensured compliance with first quality bracket parameters and, thus, the highest consideration.

Local resource allocation also includes other instruments. In particular, in addition to considerations for collection – in so-called OUT agreements – Comieco invests resources in the processing and improvement of paper for recycling. These resources are intended for plants operating on account of the parties covered by the agreements, and amounted to just less than 34 million EUR in 2019.
Over six years of operation (2014-2019) of the most recent ANCI-CONAI agreement, the Consortium allocated considerations for over 630 million EUR to support collection and almost 120 for processing. The total is close to 750 million EUR, vs. a managed amount (packaging and FMS) close to 9.4 million tons.

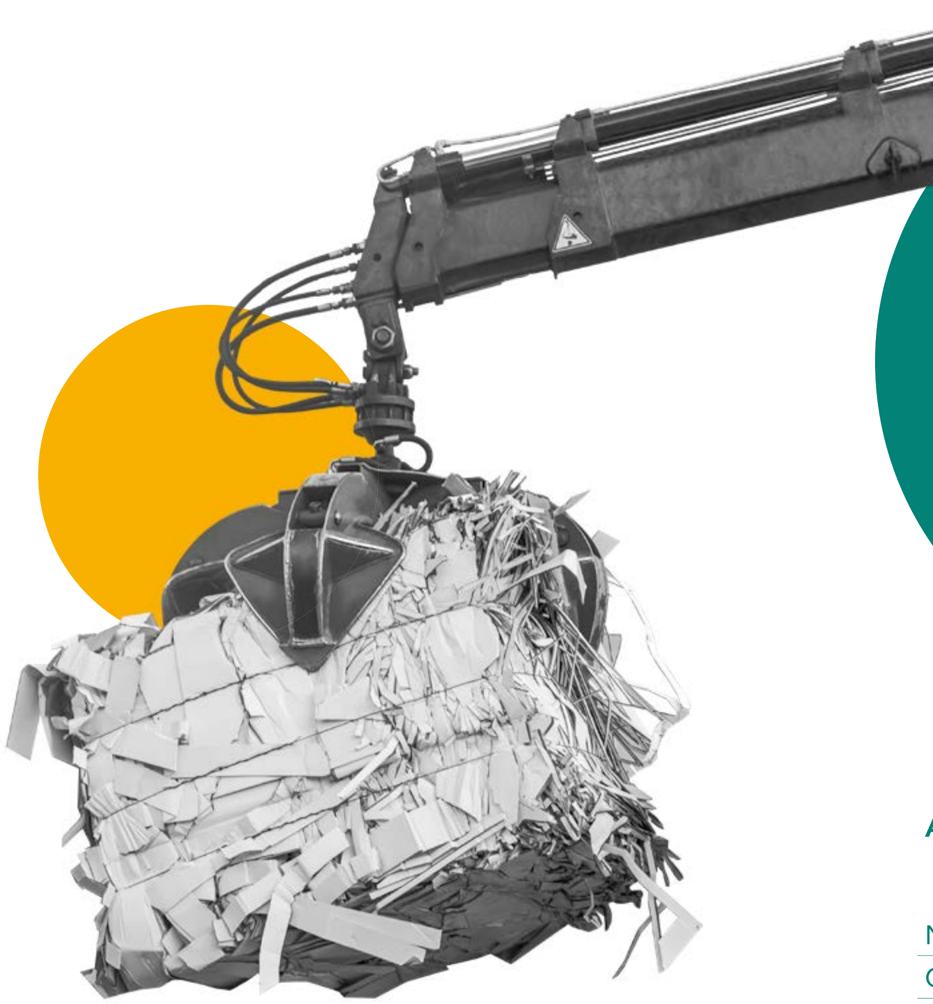
"This investment is growing significantly due to the new volumes that the Consortium has been asked to take charge of".

Additional support is provided to the regions that lag behind and whose collection performance is poor.
The implementation of two special projects for the South – the Plan for the South, sponsored by the Ministry of the Environment and of Territorial and Sea Protection for the purchase of equipment and means to support separate paper and board collection in larger cities, and the ANCI-Comieco tender, aimed at small-medium Cities – was completed in 2019.
In the 2014-2019 period, via the ANCI-Comieco Tender alone, the Consortium invested over 6 million EUR in 288 small-medium Cities (236 in the South, 47 in the Centre, and only 5 in the North). These amounts are intended for the purchase of paper and board collection equipment within the

framework of projects for development of collection in the underperforming Cities.
On the wake of the gradual development of local services, the threshold for access was gradually updated in time, and binding targets were set for collection and deadlines for their achievement. Data on the monitoring of recent actions points out to a growth close to 10% vs. 2018. Activities also provided for field audits to ensure appropriate allocation of the purchased equipment.

On the other hand, the Plan for the South supported 22 projects, providing a 7 million EUR budget. The monitoring of the last pending projects was completed in 2019. The 6 screened areas generally improved their annual collection by over 5thousand tons, with an increase close to +30%.

The closing of the fourth Framework Agreement also allows to draw a general conclusion with respect to more than 20 years. Resources for collection gradually increased and supported volume growth at national level: from one to 3.5 million tons per year.



From 1998 to 2019 municipal paper and board collection totalled 56 million tons; just less than 60% (33 million) were entrusted to Comieco. In the light of these quantities, which correspond to total urban waste production for one year, the Consortium allocated close to 1.8 billion EUR to collection and improvement services.

The amounts managed by the Consortium in 2019 are increasing (+41,4%). The payment of considerations to the Cities under the agreements is close to 130million EUR.
The average value per inhabitant grows by 20%.

TABLE 4
RESOURCES ALLOCATED TO THE PARTIES UNDER THE AGREEMENTS IN 2019. DETAILED BY AREAS.

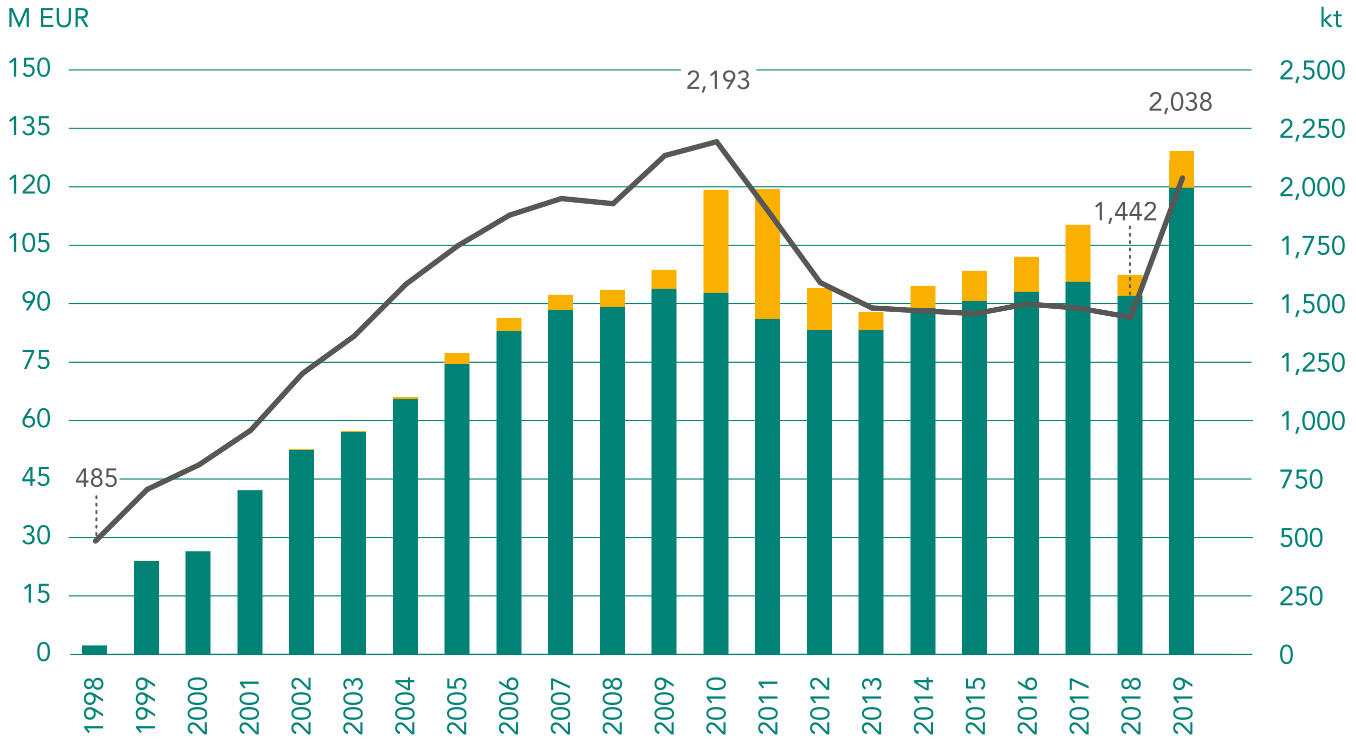
SOURCE: COMIECO

Area	Inhabitants under the agreements	Amount					
		Managed packaging	FMS	Total	Managed packaging	FMS	Total
	n	t	t	t	kg/ab	kg/ab	kg/ab
North	24,378,012	633,417	336,707	970,124	26.0	13.8	39.8
Centre	10,778,040	245,376	158,376	403,752	22.8	14.7	37.5
South	19,166,938	392,542	272,005	664,547	20.5	14.2	34.7
Italy	54,322,990	1,271,335	767,088	2,038,423	23.4	14.1	37.5

Area	Inhabitants under the agreements	Economicresource					
		Managed packaging	FMS	Total	Managed packaging	FMS	Total
	n	euro	euro	euro	euro/ab	euro/ab	euro/ab
Nord	24,378,012	61,691,020	4,319,994	66,011,014	2.5	0.2	2.7
Centro	10,778,040	23,109,794	1,919,475	25,029,269	2.1	0.2	2.3
Sud	19,166,938	34,862,308	3,310,473	38,172,781	1.8	0.2	2.0
Italy	54,322,990	119,663,122	9,549,943	129,213,065	2.2	0.2	2.4

FIGURE 9
ECONOMIC INVESTMENT.
1998-2019 HISTORICAL DATA SET.

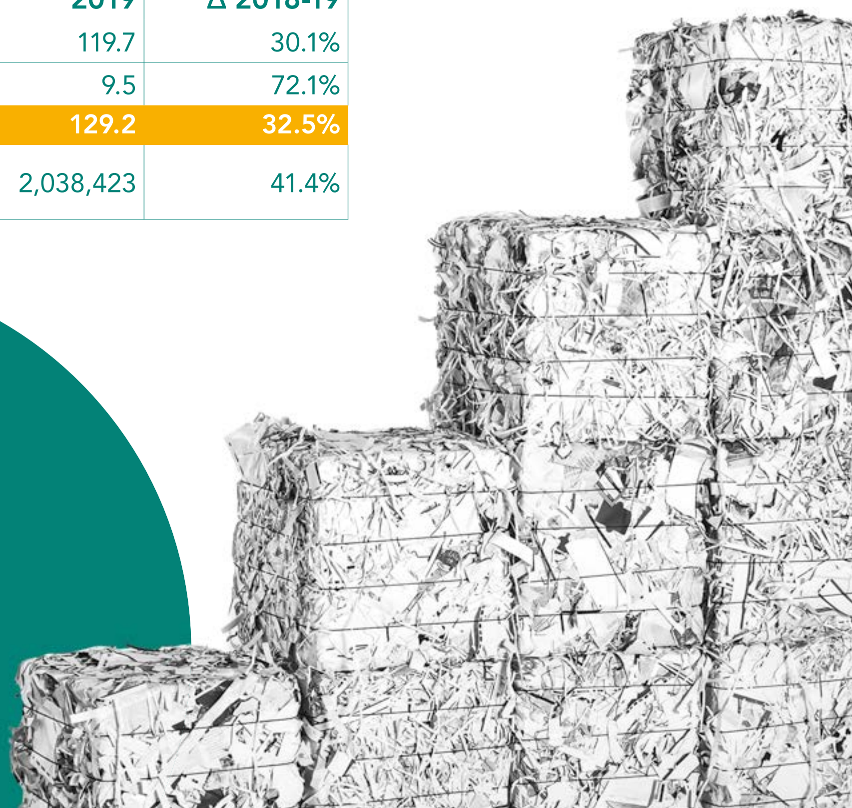
SOURCE: COMIECO



		1st ANCI-CONAI Agreement 1998-2003	2st ANCI-CONAI Agreement 2004-2008	3st ANCI-CONAI Agreement 2009-2013	4st ANCI-CONAI Agreement 2014-2019	Total
Packaging	million EUR	204.2	400.3	439.0	579.6	1,623.1
FMS	million EUR	0.4	15.3	80.2	52.6	148.5
Total	**million EUR**	**204.6**	**415.6**	**519.2**	**632.2**	**1,771.6**
Managed collection	t	5,523,979	9,088,263	9,295,707	9,386,935	33,294,884

		2018	2019	Δ 2018-19
Packaging	million EUR	92.0	119.7	30.1%
FMS	million EUR	5.5	9.5	72.1%
Total	**million EUR**	**97.5**	**129.2**	**32.5%**
Managed collection	t	1,441,792	2,038,423	41.4%

Comieco managed over 33 million tons of paper and board derived from municipal collection from 1988 to 2019, and paid considerations for almost 1.8 billion EUR.



QUALITY – A PRIMARY GOAL ACROSS THE COUNTRY

1,188

TESTS IN ONE YEAR

The results of the tests performed during 2019 outline a different picture if both flows for the three macro-areas (1.01+1.02 from households and 1.04+1.05 from business users) are considered.
As to 1.01+1.02, the national average result for 2019 is important: after 3 years above thresholds, the 2.62% average amount of contaminants returns within the limits set for the first quality bracket (3%).

For the 2019 performance, in particular, the national figure should be extracted and the behaviour of the individual macro-areas should be observed: the North (1.68% in 1.01+1.02) improves despite having the best national baseline value; the Centre and the South record a general improvement (3.57% and 3.07% of contaminants respectively), but remain above threshold for the highest quality stated in the Paper Technical Annex.

The very high quality of cardboard collection is confirmed, with the national average figure and data for the three macro-areas far below first-bracket limits and materials ready for recycling as soon as collected, except for logistic issues.
The goal of the entire pipeline, from citizens to final recyclers, is to keep improving starting from the very early steps, ensuring high value generation at all stages of the recycling process.

Punctual monitoring via quality controls allows prompt identification of critical players, such as certain big cities (particularly in the Centre). Second-level controls, including on individual collection circuits, provide important information for punctual improvement.

2.62% AVERAGE CONTAMINANTS IN 1.01+1.02

0.65% AVERAGE CONTAMINANTS IN 1.04+1.05

As in previous years, in 2019 Comieco, supported by three specialized companies, carried out 181 audits of sorting plants (77), paper mills (74), and processing plants (30) aimed at:

- ensuring that transparent and reliable data is reported;
- providing guarantees on system control levels;
- ensuring appropriate system operation with minimized litigations.

Audits at the management plants were aimed at ensuring compliance with contract requirements and performing a mass check of the materials in transit from parties under the agreements, intended for paper mills.

Audits at paper mills and processing plants were aimed at ensuring the truthfulness of the statements made to Comieco with respect to packaging production (BaDaCom statements).

The criticalities observed during the audits were formally addressed by the Consortium via the implementation of specific corrective actions.

	Year 2018		Year 2019		Δ 2018/2019
	Tests	Contaminants	Tests	Contaminants	Contaminants
	n	%	n	%	%
1.01 + 1.02	1st quality bracket threshold: 3.0%				
North	115	1.90	260	1.68	-0.22
Centre	231	4.00	223	3.57	-0.43
South	312	3.51	274	3.07	-0.44
Italy	**658**	**3.31**	**757**	**2.62**	**-0.69**
1.04 + 1.05	1st quality bracket threshold: 1.5%				
North	80	0.41	98	0.42	0.01
Centre	78	0.64	92	0.74	0.10
South	285	0.86	241	0.70	-0.16
Italy	**443**	**0.71**	**431**	**0.65**	**-0.06**

TABLE 5
QUALITY OF THE COLLECTED MATERIALS (AVERAGE RATE OF CONTAMINANTS). 2018-2019 COMPARISON BY MACRO-AREAS.

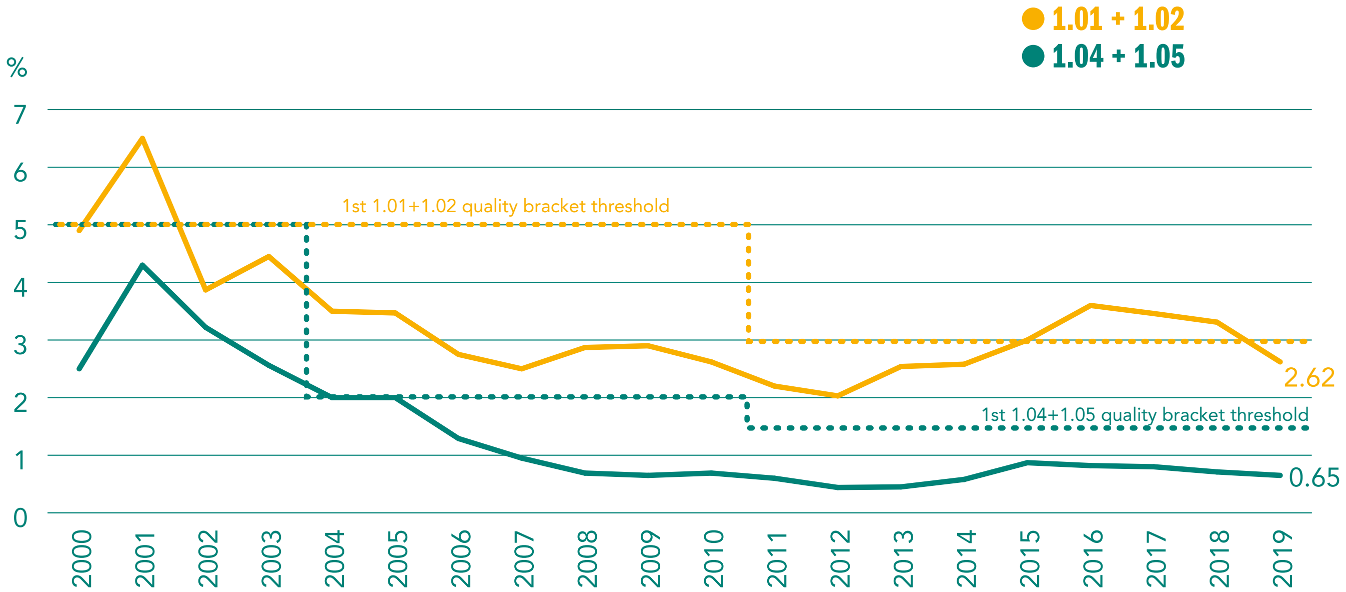
SOURCE: COMIECO

After surpassing the thresholds for 3 years the average rate of contaminants in household collection flows returns within the limits set for the first quality bracket. The trend of business collection is also stable and positive.

FIGURE 10
QUALITY OF THE COLLECTED MATERIALS (MEAN TREND OF CONTAMINANTS). 2000-2019

SOURCE: COMIECO

The controls challenge confirms the improvements observed last year with respect to the rate of contaminants in 1.01+1.02. Business collections provide recycling-ready materials.



Performed tests		1st ANCI-CONAI Agreement 1998-2003	2nd ANCI-CONAI Agreement 2004-2008	3rd ANCI-CONAI Agreement 2009-2013	4th ANCI-CONAI Agreement 2014-2019	Total 1998-2019
1.01+1.02	n	1,006	3,456	4,040	4,286	12,788
1.04+1.05	n	594	3,591	4,204	2,931	11,320

Note: Until June 2014 the above results refer to the total tests performed at the sorting plants on both incoming and outgoing materials in order to determine the considerations due to the parties under the agreements. From July 2014 these results only refer to tests on incoming materials in the so-called "IN agreements" that apply for payment of the collection consideration.

RECYCLING PLANTS - A WIDESPREAD, YET STILL GROWING NETWORK

The materials collected under the management of Comieco at national level are conferred to 364 sorting plants that receive them and provide for sorting and pressing. This network of plants that spreads across the national territory helps cost containment by ensuring that vehicles are unloaded at a short distance away from collection points (16.2 km on average). Logistic optimization, which is key to improve recycling, needs to reconcile the possibility to confer the materials at a short distance from the collection point with the creation of a critical mass across the plants network to achieve scale economies and investments to improve processing. The materials processed at the sorting plants are recycled via two complementary channels. Sixty percent (over 1.2 million tons) of the amount managed by Comieco is entrusted on a pro-quota basis to 56 paper mills that ensure recycling across the national territory. The other 40% (approximately 824thousand tons) is awarded – by regular auctions – to parties having the necessary operational capacity to ensure recycling – either in Italy or abroad.
In 2019 34 parties were awarded at least one lot.

364
SORTING PLANTS

56
PAPER MILLS IN ITALY RECYCLING THE PAPER MANAGED BY COMIECO

Area	Sorting plants	Average distance for conferment	Paper mills (plants)
	n	km	n
North*	143	16,3	32
Centre	70	16,3	17
South	151	16,1	7
Total	**364**	**16,2**	**56**

one paper mill is located in the territory of the Republic of San Marino

FIGURE 11 THE RECYCLING PLANTS NETWORK. YEAR 2019.
SOURCE: COMIECO

Comieco ensures that 58% of the managed material is recycled through awarding to member paper mills, and the remaining share is awarded by auction based on the commitments made with AGCM in 2011. Ninety-eight percent of this material was anyway recycled at Italian plants.

AVERAGE DISTANCE FROM COLLECTION SITES
16.2 km

● PAPER MILLS
● SORTING PLANTS

THE CIRCULAR ECONOMY OF THE PAPER PIPELINE

88.4%

PAPER AND BOARD PACKAGING RECOVERED

80.8%

PAPER AND BOARD PACKAGING RECYCLED

Paper production amounted to just more than 1.9 million tons in 2019, down (-2%) compared to 2018. Once again, packaging production (4.6 million tons) surpassed the production of other paper types – 4.3 million tons – even if both product groups recorded a -0.7% and -3.3% decline respectively.

"As online shopping increases, packaging also increases".

This trend confirms the technological replacement process under way in the publishing and data storage sector. Graphic paper production declined in the past decade, as also confirmed by the circulation data of ADS (the press circulation data monitoring service), which shows that the circulation of newspapers was reduced by more than half in the same period.

As to e-commerce, Netcomm estimates that about 20 million deliveries are performed in Italy every month, with a subsequent packaging flow that can represent an opportunity for the recycling industry.

4.9 million t

APPARENT PAPER AND BOARD PACKAGING CONSUMPTION

The ability to provide effective and quick delivery and picking services is one of the main competitive factors at the basis of the challenges for e-commerce, and packaging is involved in this revolution. While packaging is key in customer service, the increase of online shopping results into a clear need to find sustainable solutions for production and recovery.

According to the Data Base of the Italian Packaging Institute for the packaging sector in this area, 92% of orders are shipped in corrugated board packaging: they are mostly boxes, but stiff cardboard envelopes are also used for small items, such as stationery or books.

293,000 tons of corrugated board were used in 2019 for the boxes for shipment of e-commerce items, approximately 6% of the total corrugated board produced in Italy. On the other hand, the recent positive trend of this material (+2% per year from 2014 to 2019) was driven by e-commerce. The national recycling system absorbs 5 million tons of the materials available from collections, approximately 100thousand tons less (-1.6%) compared to 2018.

"There is a clear need to find sustainable solutions for production and recovery".

The remaining share of paper for recycling is recycled abroad: the net export balance is above 1.5 million tons, unchanged with respect to 2018, yet with a decrease of the exchanged volumes by approximately 100thousand tons. In percent terms the corresponding indexes are: imports -23.5%, exports -5.1%.

Paper and board packaging management confirms and consolidates the achievement of the recycling and recovery targets (80.8% and 88.4% respectively). With an apparent consumption of 4.9 million tons (-1.1% vs. 2018), just less than 4.0 million are recycled, whereas 377thousand tons are recovered.

These values show that the targets set by directive 2018/852/EC for 2025 (75% recycling) have already been met at national level. The paper for recycling market was very weak throughout 2019, and the price decline affected a growing amount of precious paper types. Weak signs of recovery appeared in the early months of 2020, but this trend is not consolidated.

But what and how many benefits derive from these efforts? Benefits are both direct and indirect and can be translated into economic values using specific indications. Comieco's activity alone – 1.3 million tons of packaging managed in 2019 – results into 65 million EUR benefits if the value of the generated raw materials and of the avoided CO_2 emissions from recycling processes is calculated. The above figures should be seen in combination with the positive impact of non-disposal, of new job generation and, more generally, of civic value in terms of territorial protection.

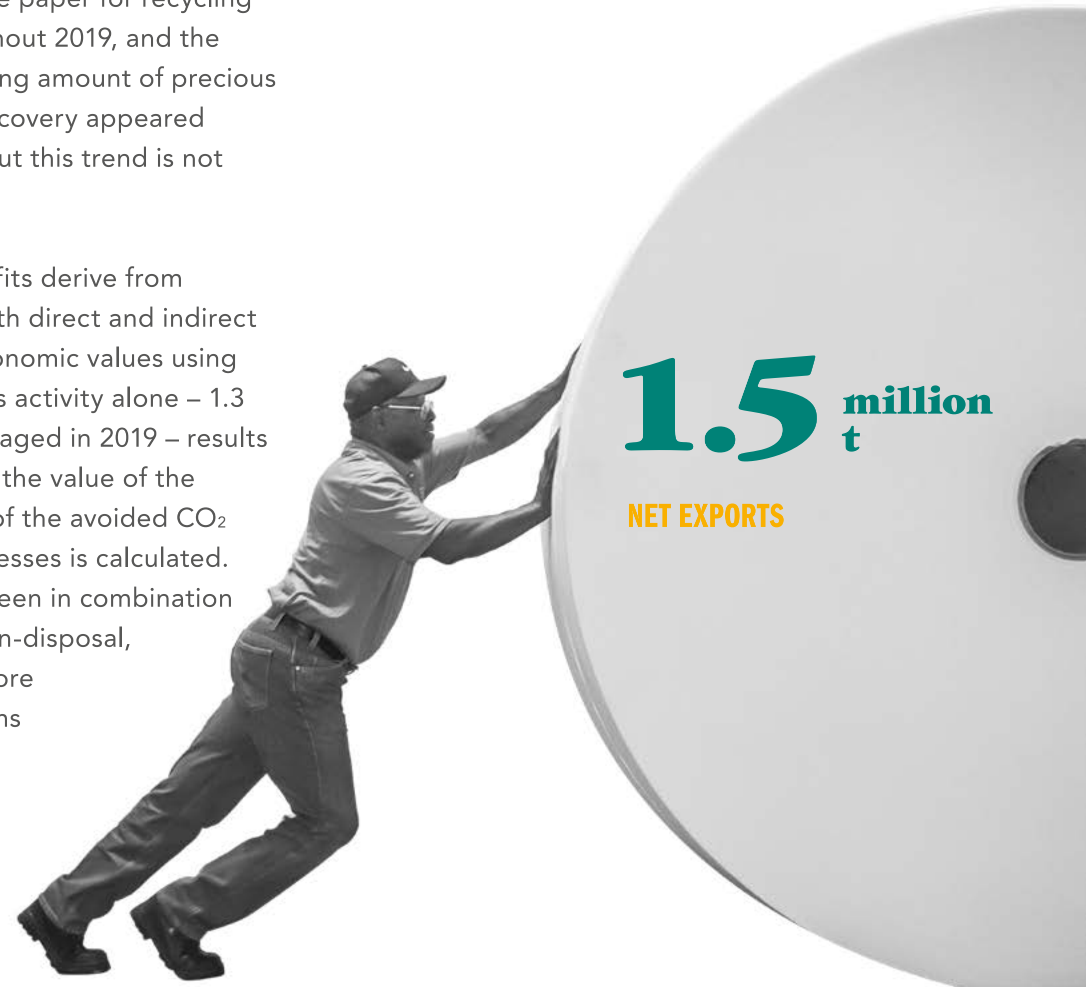


TABLE 6
PAPER AND BOARD PACKAGING RECOVERY AND RECYCLING TARGETS ACHIEVED IN 2019.

SOURCE: COMIECO

Recycling and recovery rate calculation	year 2019	Δ 2018/2019
	t	%
Apparent paper and board packaging consumption	4,938,994	-1.1
Waste paper and board packaging contained in paper and board for recycling of the 1.01 and 1.02 type, recycled in Italy	470,686	23.7
Waste paper and board packaging contained in paper and board for recycling of the 1.04 and 1.05, type, recycled in Italy	2,187,694	-4.4
Waste packaging recycled abroad	1,330,489	0.7
Total waste paper and board packaging conferred for recycling	3,988,869	-0.1
Paper and board packaging recovered as energy	377,011	0.9
Recovered paper and board packaging	4,365,880	0.0

	year 2019
% Recycling	80.8
% Energy recovery	7.6
% Recovery	88.4

Note: The apparent consumption data for 2013 was adjusted by CONAI, the apparent consumption data for 2014 includes tubes and rolls subject to the CAC (the CONAI environmental contribution) effective from 1/1/2014.

TAB. 7
DIRECT AND INDIRECT BENEFITS OF MANAGED PAPER AND BOARD RECYCLING. 2019 DATA.

SOURCE: CONAI - TOOL LCC

The benefits generated through the managed recycling of packaging (just less than 1 million tons) in 2019 are worth an estimated 65 million EUR. The 2005-2019 aggregated data points out to benefits close to 1.2 billion EUR, calculated as the value of the raw material and of the emissions avoided.

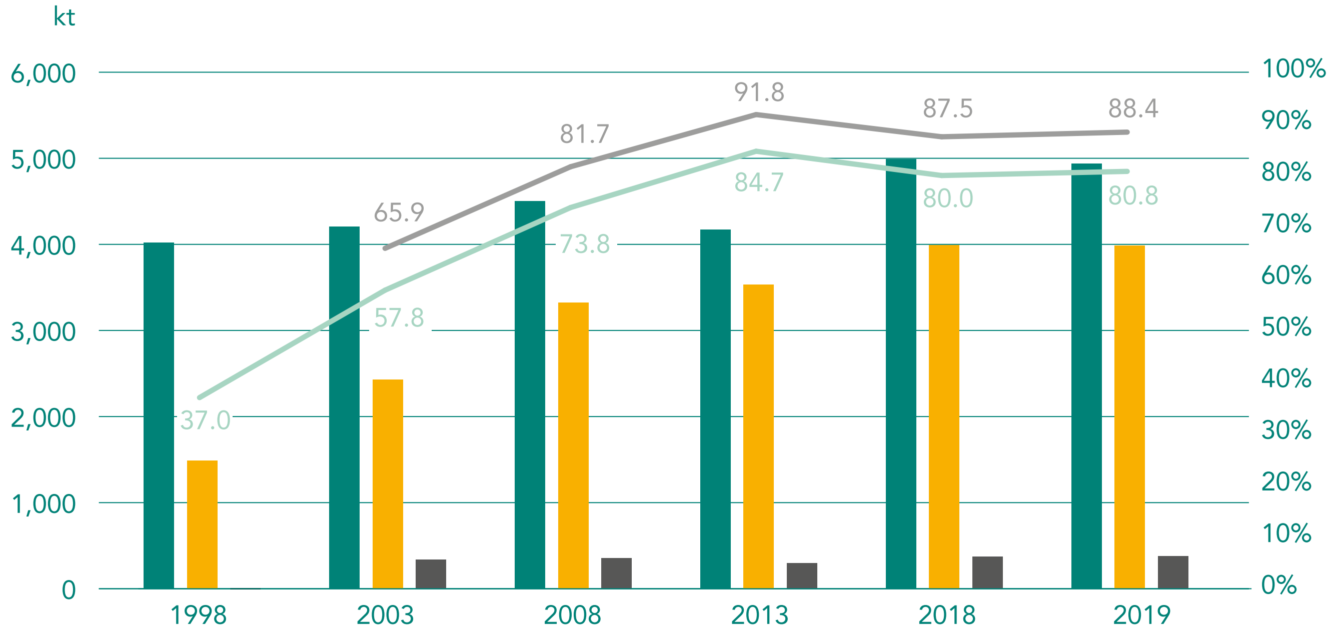
Indicators within the CONAI boundaries (managed by Comieco)				
Indicator			**2019**	**tot. 2005-2019**
Amount of conferred packaging		kt	1,271	15,458
Fractions for recycling		kt	1,271	15,458
Fractions for energy recovery		kt	0	0
Fractions for other forms of disposal		kt	0	0

Environmental benefits				
Indicator			**2019**	**tot. 2005-2019**
Primary raw material saving, paper		kt	1,080	15,267
Electric power produced from energy recovery		TJ	0	0
Thermal power produced from energy recovery		TJ	0	0
Primary energy saving through recycling		TJ	15,711	206,239
CO_2 production avoided through recycling		kt CO_2 eq	1,092	13,969
CO_2 production avoided through energy recovery		kt CO_2 eq	0	0

Valore economico				
Category			**2019**	**tot. 2005-2019**
Direct benefits	Economic value of the secondary raw material obtained from recycling	million EUR	32	826
	Economic value of the energy produced from recycling	million EUR	0	0
Indirect benefits	Economic value of the avoided CO_2 emissions	million EUR	33	418
Overall benefits		million EUR	65	1,244

FIGURE 12
PAPER AND BOARD PACKAGING RECYCLING AND RECOVERY TARGETS ACHIEVED. 1998-2018 HISTORICAL DATA SET.

SOURCE: COMIECO



- APPARENT PAPER AND BOARD PACKAGING CONSUMPTION (KT)
- TOTAL WASTE PAPER AND BOARD PACKAGING FOR RECYCLING (KT)
- PAPER AND BOARD PACKAGING RECOVERED AS ENERGY OR WASTE-BASED FUEL (KT)
- RECYCLING RATE (%)
- RECOVERY RATE (%)

Notes:

- *Energy recovery before 2003 only monitored for the amounts manged under the agreements. Overall data not available.*
- *The apparent consumption data for 2013 was adjusted by CONAI, the apparent consumption data for 2014 also includes tubes and rolls subject to the CAC (the CONAI environmental contribution) effective from 1/1/2014.*

European recycling targets achieved and to be achieved

European Directive	Directive 94/62/CE	Directive 2004/12/CE	Directive 2018/852/CE	Directive 2018/852/CE
Target compliance deadline	June 30, 2001	December 31, 2008	December 31, 2025	December 31, 2030
EU paper and board packaging recycling targets	General (all materials) between 25% and 45% with a minimum 15% threshold for each material	60%	75%	85%
Paper and bo-ard packaging recycling results in Italy	50,7%	62.4% met and surpassed as early as in 2004	80.4% met and surpassed as early as in 2009	The current recycling rate is 80.8%

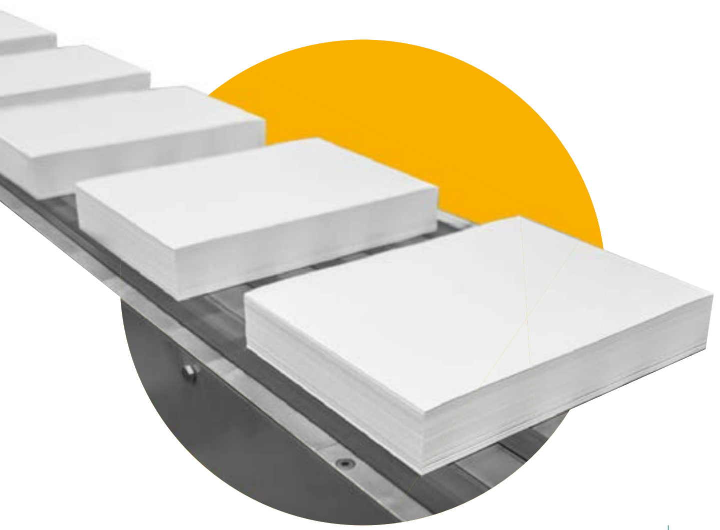


TABLE 8
PAPER AND BOARD PRODUCTION IN 2019.
SOURCE: ISTAT DATA AND ASSOCARTA ESTIMATES PROCESSED BY ASSOCARTA

The development of consumption patterns emerges from the data. While the increase of e-commerce supports the packaging segment, gradual digitalization is evident from graphic paper segment indicators.

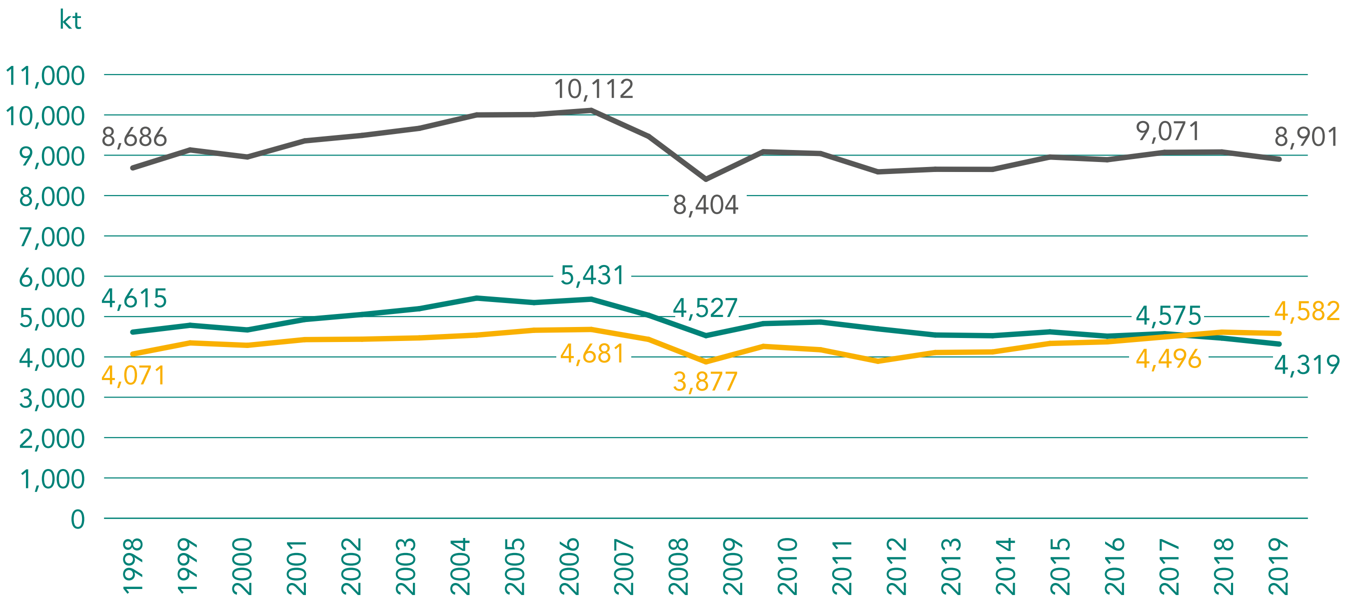
		Production (A)	Import (B)	Export (C)	Apparent consumption (A+B-C)
Paper and board packaging (paper, board, and cardboard)	t	4,582,267	3,380,179	1,395,511	6,566,935
Δ 2018/2019	%	-0.7	0.5	-7.7	1.6
Other paper and board (paper for graphic and hygienic-sanitary use)	t	4,318,597	2,026,506	2,328,880	4,016,223
Δ 2018/2019	%	-3.3	-6.2	-1.9	-5.6
Total paper production	t	8,900,864	5,406,685	3,724,391	10,583,158
Δ 2018/2019	%	-2.0	-2.1	-4.2	-1.2

TABLE 9
CONSUMPTION, IMPORTS, EXPORTS OF PAPER FOR RECYCLING AND APPARENT COLLECTION*. 2018-2019 VARIATIONS.
SOURCE: ASSOCARTA DATA PROCESSED BY COMIECO

		Import (A)	Export (B)	Consumption (C)	Apparent collection* (B+C-A)
2018	kt	406	1,912	5,144	6,649
2019	kt	311	1,815	5,060	6,564
Δ 2018/19	%	-23.5	-5.1	-1.6	-1.3

*Apparent collection: Consumption of paper for recycling - imports + exports

FIGURE 13
PAPER AND BOARD PRODUCTION. 1999-2019 HISTORICAL DATA SET.
SOURCE: ISTAT DATA AND ASSOCARTA ESTIMATES PROCESSED BY ASSOCARTA



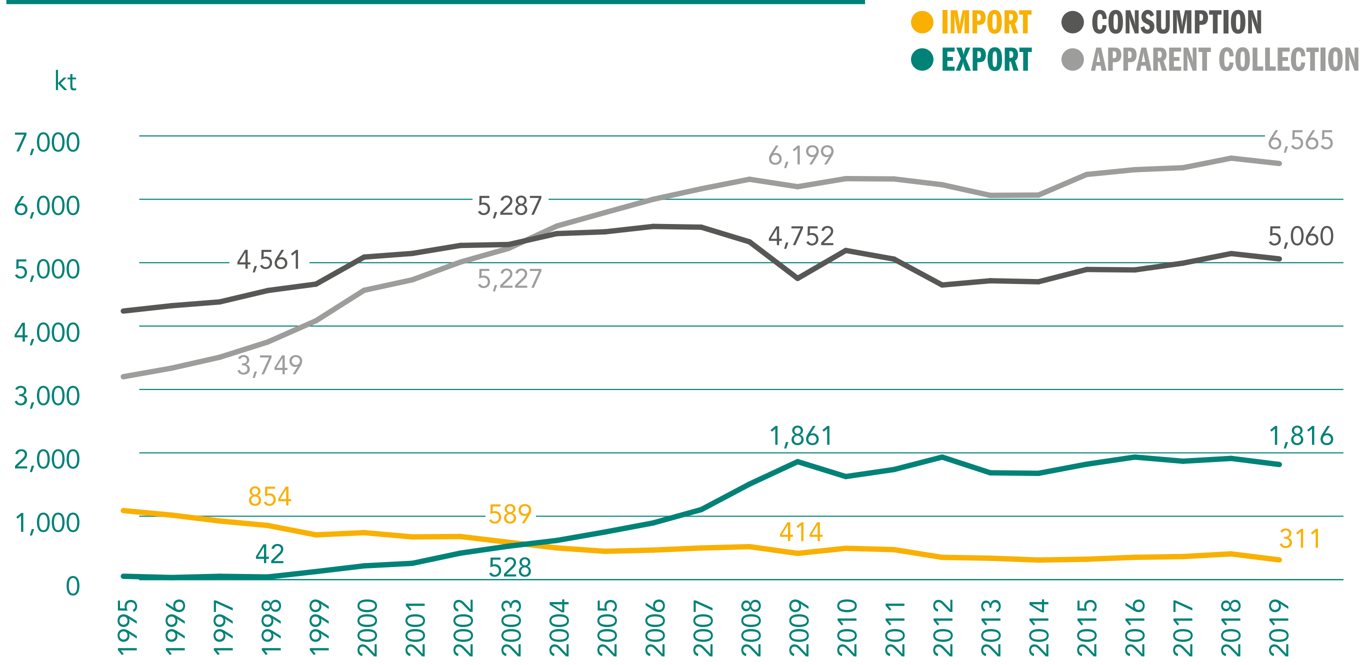
		1999	2003	2008	2013	2018	2019	1999/2019 Δ kt	1999/2019 Δ %	2018/2019 Δ kt	2018/2019 Δ %
Packaging	kt	4,071	4,440	4,434	4,109	4,614	4,582	511	12.6	-31	-0.7
Other paper and board	kt	4,615	5,051	5,033	4,543	4,467	4,319	-296	-6.4	-149	-3.3
Total paper production	kt	8,686	9,491	9,467	8,652	9,081	8,901	215	2.5	-180	-2.0

FIGURE 14
CONSUMPTION, IMPORTS, EXPORTS OF PAPER FOR RECYCLING AND APPARENT CONSUMPTION*. 1995-2019 PERIOD.

SOURCE: ASSOCARTA DATA PROCESSED BY COMIECO

The domestic consumption of paper for recycling is stable above 5 million tons. Net exports confirm a balance of more than 1.5 million tons.

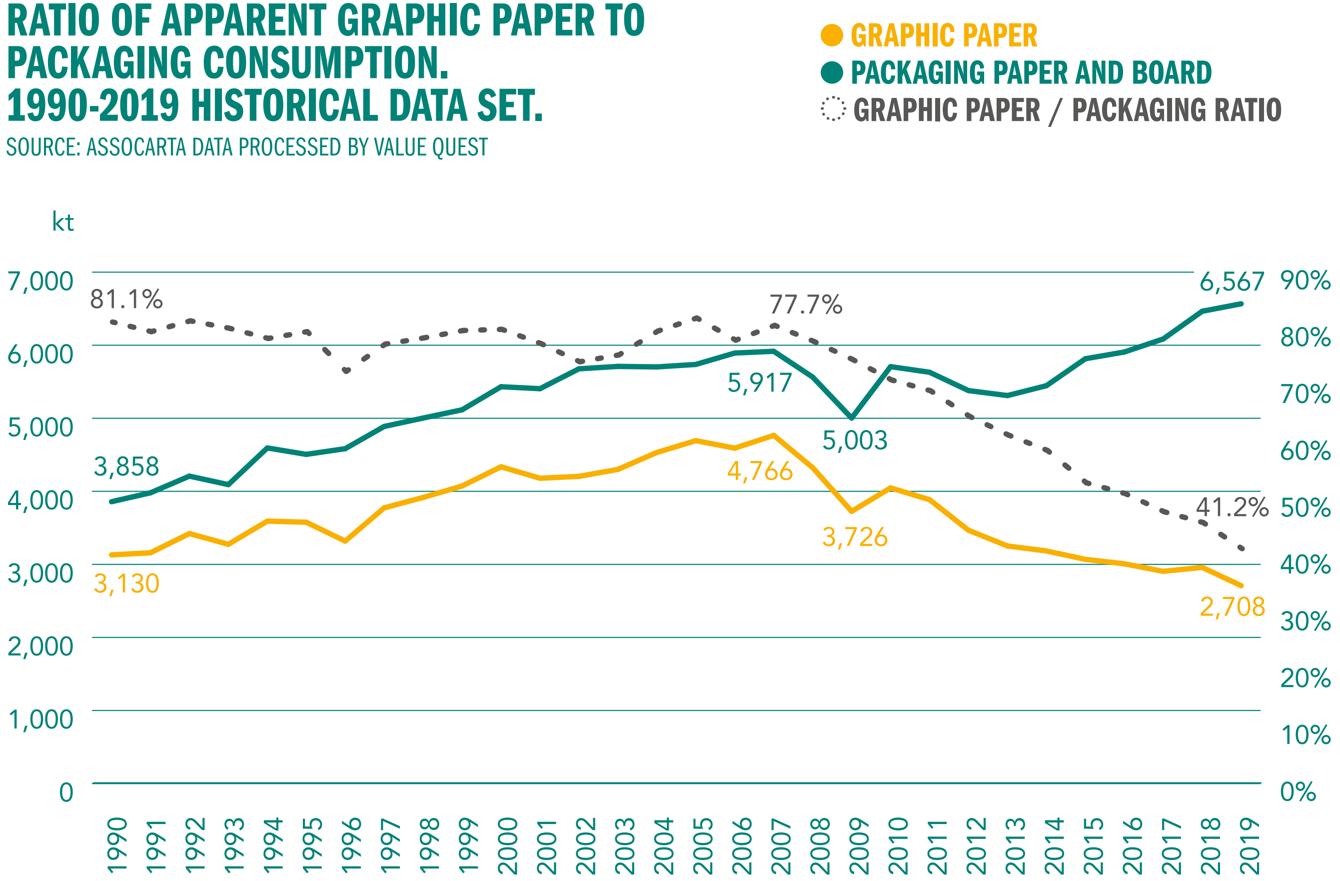
		1998	2003	2008	2013	2018	2019	1998/2019 Δ kt	1998/2019 Δ %	2018/2019 Δ kt	2018/2019 Δ %
Import	kt	854	589	520	338	406	311	-543	-63.6	-95	-23.5
Export	kt	42	528	1,507	1,685	1,912	1,816	1,774	+4,223.4	-96	-5.0
Consumption	kt	4,561	5,288	5,329	4,715	5,144	5,060	499	+10.9	-84	-1.6
Apparent collection	kt	3,749	5,227	6,316	6,062	6,649	6,565	2,816	+ 75.1	-85	-1.3
Net exports	kt	-812	-61	987	1,347	1,506	1,505				



*Apparent collection: Consumption - Imports + Exports

FIGURE 15
RATIO OF APPARENT GRAPHIC PAPER TO PACKAGING CONSUMPTION. 1990-2019 HISTORICAL DATA SET.

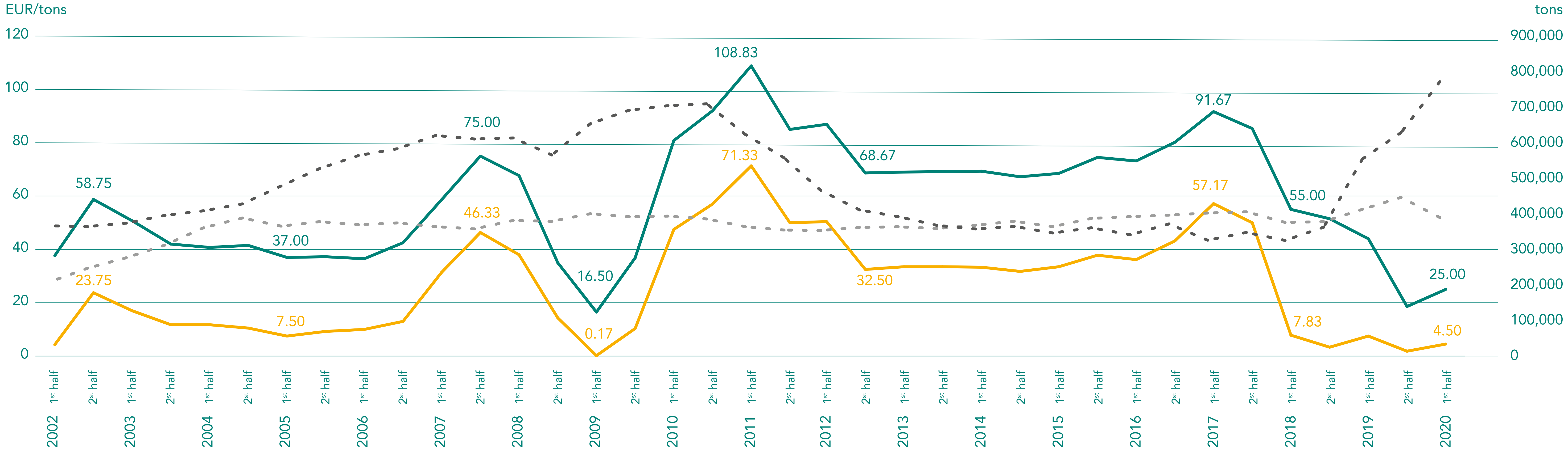
SOURCE: ASSOCARTA DATA PROCESSED BY VALUE QUEST



The ratio of graphic paper consumption to packaging paper consumption was gradually reversed over time. This phenomenon emerged in 2009 and developed for graphic paper, in particular, until values fell below the 1990 threshold. The different composition of the consumption mix also brings about a significant change in the "quality" of the collected materials and in subsequent issues connected with the processing of paper for recycling.

FIGURE 16
SIX-MONTHLY RECORDING OF AVERAGE PAPER FOR RECYCLING VALUES (EUR/T) AND COMPARISON WITH THE AMOUNTS OF PAPER AND BOARD MANAGED UNDER THE AGREEMENTS. JANUARY 2002 – MAY 2020 PERIOD.

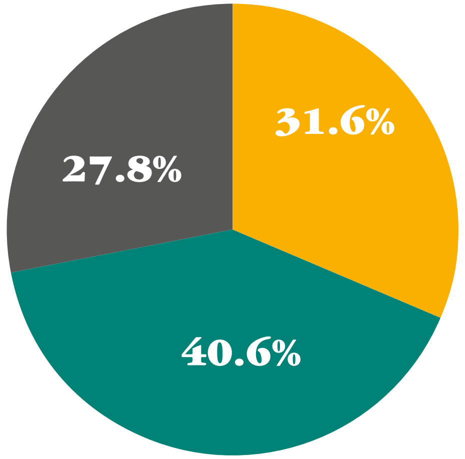
SOURCE: CHAMBER OF COMMERCE OF MILAN



NOTE ON THE METHOD

The processing method adopted for data on national paper and board collection is the same as in the previous years. Some of the 2018 data is updated on the ground of the ISPRA data for the provinces; the related data (area and national totals, per-capita, etc.) is updated accordingly.

Data processed by the Entities and/or organizations in charge of monitoring or managing waste flows (ISPRA, Regions, Agencies, Provinces and Work Groups, ANCI, Cities, operators, plants, etc.) is mainly used to determine separate paper and board collection levels.
The data thus acquired is overlapped with and compared to the data available to Comieco within the framework of its activity (management of the agreements) to ensure consistency and, if necessary, to carry out further focused reviews.



Processing is usually carried out at province level but, in specific cases, a more in-depth analysis is performed (e.g. Cities).
Where "official" data is not available, Comieco estimates the provincial collection level starting from its own data base (data on collection by the parties under the agreements). Estimates consider separate paper and board collection as being actively in place across the national territory.

As to 2019 evaluations, constituting the object of this report, the share of estimated data increases: 40.6% of collection data comes from third-party sources, 31.6% refers to the amounts managed directly by the Consortium, i.e. disclosed by the parties to the agreements as provided for by the Technical Annex (without any other sources), and 27.8% is based on estimated amounts.
Data processed as at May 2020.

SOURCES AND METHOD.
SOURCE: COMIECO

● ESTIMATED BY COMIECO
● COLLECTED UNDER THE AGREEMENTS
● THIRD-PARTY SOURCES

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Comieco
National Consortium for
Recovery and Recycling of
Paper and Board Packaging

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