



# CONAI GREEN ECONOMY REPORT — 2018 —



## → Letter from the President

In 2018, almost 10.7 million tonnes of packaging waste were sent for recycling and recovery. This is 80.6% of the amount put on the market, well above the legal targets, a trend that is constantly and progressively growing. This figure is the result of more than twenty years of work by the Consortium System whose mission was, and still is, to evolve the supply chain from a management model based on recourse to landfills to the "recycling society", based on the circular economy model. This mission that we can say has been met since from 1998 to 2018, recourse to landfills for packaging waste in Italy has gone from 67% to 19%, above all bridging the gap with other major European countries. Packaging sent for recycling in 2018 in Italy amounted to approximately 9.3 million tonnes, i.e. 69.7% of the quantity put on the market and with quantities tripled compared to those of 1998.

Our aim was to quantify these flattering results also in terms of the positive effects they have on the environment, the economy and society. And to do this, we chose a cutting-edge scientific methodology, Life Cycle Costing, which, thanks to precise traceability of the packaging waste flows managed by the Supply Chain Consortia, highlights the contribution that the CONAI-Consortia system has made in terms of positive externalities in a more intelligible manner.

All this with an eye on the new circular economy objectives that consider the role of design as a tool for preventing the environmental impact of packaging to be central. For this reason, the Green Economy Report includes a specific analysis on the positive effects that eco-design interventions, promoted by companies and narrated by CONAI as examples of good practice, have on the environment.

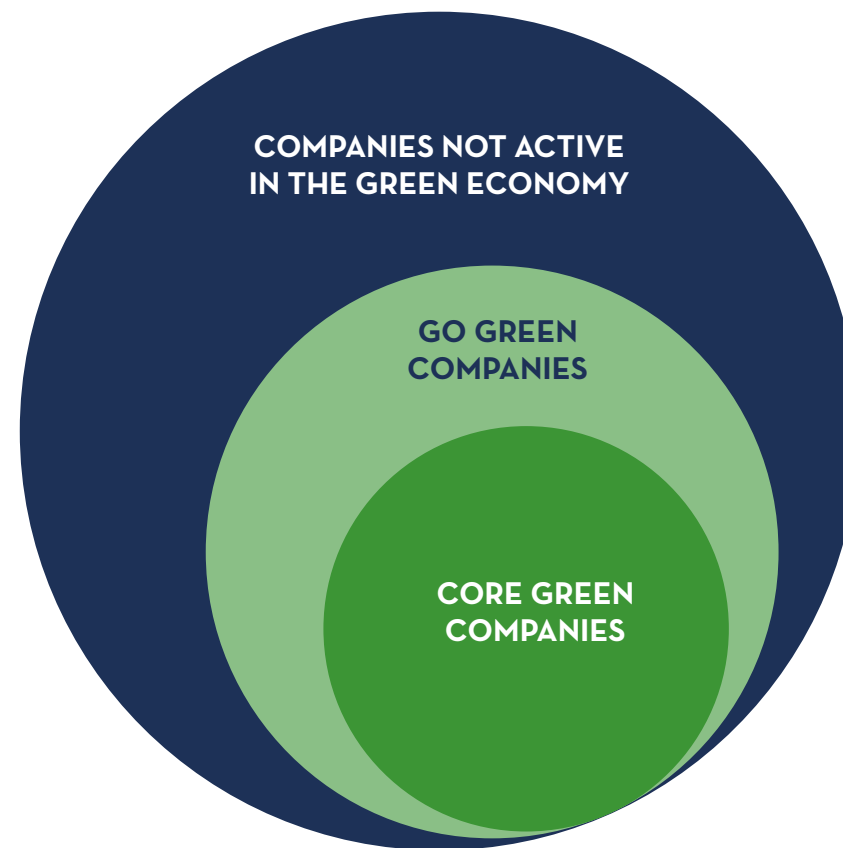
**CONAI President**  
**Giorgio Quagliuolo**



## → Interpretation guide

The CONAI 2018 Green Economy Report has been prepared according to the reporting model devised by the Foundation for Sustainable Development in order to meet the reporting and communication needs of those organisations that actively operate in the green economy. Compared to the traditional standards of sustainability reporting, with which this model is perfectly compatible, the scope of analysis adopted becomes wider, going as far as to include the effects - both positive and negative - generated by the goods and services offered by the organisation during their entire life cycle, on society, the economy, the environment and more generally on the national economic system as a whole. Good green economy reporting must look at what an organisation produces and not only at how it produces it, since it is often the products themselves, more than the related production processes, that affect the environment, the economy and society. This is particularly true for those companies which, like CONAI, are among the "core green" organisations, which produce goods or services with high environmental value.

The report is divided into four sections: the first illustrates the state of the art of recycling and recovery performance of packaging waste in Italy; the second shows the contribution of CONAI and Supply Chain Consortia to the achievement of the national performance, as well as the environmental and socio-economic benefits generated by the recycling and recovery activities carried out by the Consortium over the years; the third part is dedicated to the six Supply Chain Consortia, highlighting the main figures in terms of structure (population covered and municipalities served) and performance (management, environmental and socio-economic); the fourth part is dedicated to CONAI's commitment to prevention and illustrates the results of an analysis aimed at measuring the environmental benefits generated by the prevention actions on packaging carried out by a number of Italian companies that have received awards in recent years in the Prevention Call.



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A background image showing several recycling bins filled with various types of packaging waste. A blue bin in the foreground contains cardboard boxes, paper cups, and crumpled paper. A yellow bin in the background contains metal cans and other containers. A green bin on the right contains plastic bottles. A dark blue diagonal shape is in the bottom right corner.

# NATIONAL PACKAGING WASTE MANAGEMENT

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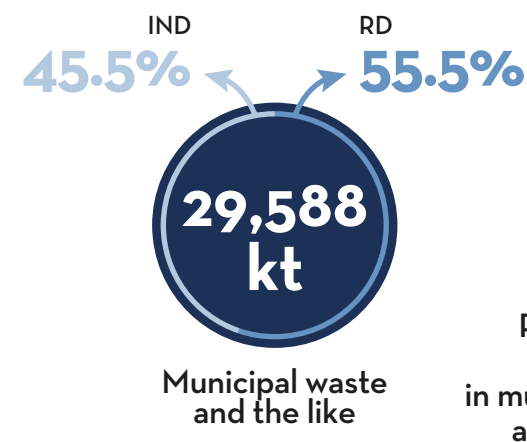
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## WASTE IN ITALY

# FOCUS

The amount of packaging put on the market in 2017 totalled **13.3 million tonnes**, equal to **8% of all waste generated during the year**. Packaging waste represents approx. 26-28% of municipal solid waste generated in a year.



Source: ISPRA for municipal and special waste (2017 figure) - CONAI for packaging waste



## WASTE IN ITALY

## FOCUS

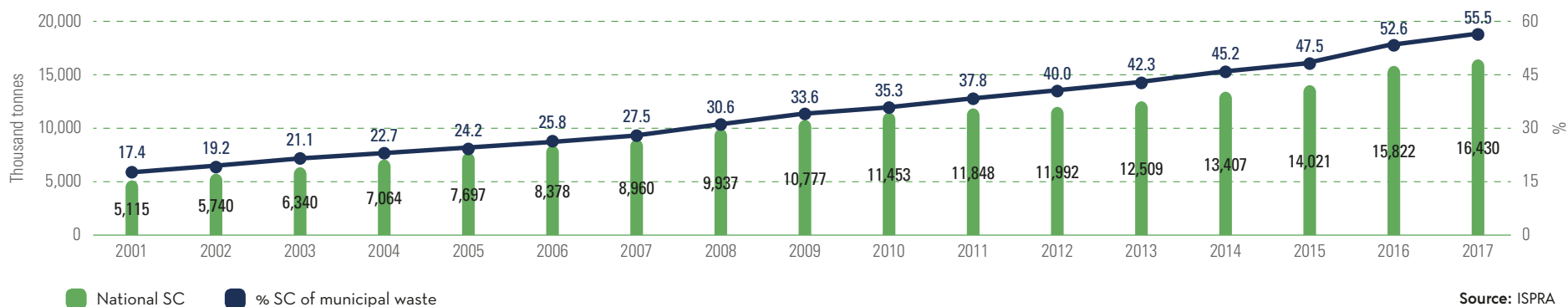
Over the years, out of the approx. 30 million tonnes of municipal solid waste generated, the quantities collected separately have steadily increased, both in absolute terms and as a percentage of total municipal solid waste collected: from 17% in 2001 to over 55% in 2017 (more than half of the municipal solid waste collected), from 5 to over 16 million tonnes collected in total. Of the latter, approx. 48% consists of paper, glass, plastic, metal and wood waste, which also includes packaging waste.

→ **Average percentage of packaging waste on total collection of individual product segments of municipal waste, average calculated over the period 2013-2017**



Source: ISPRA

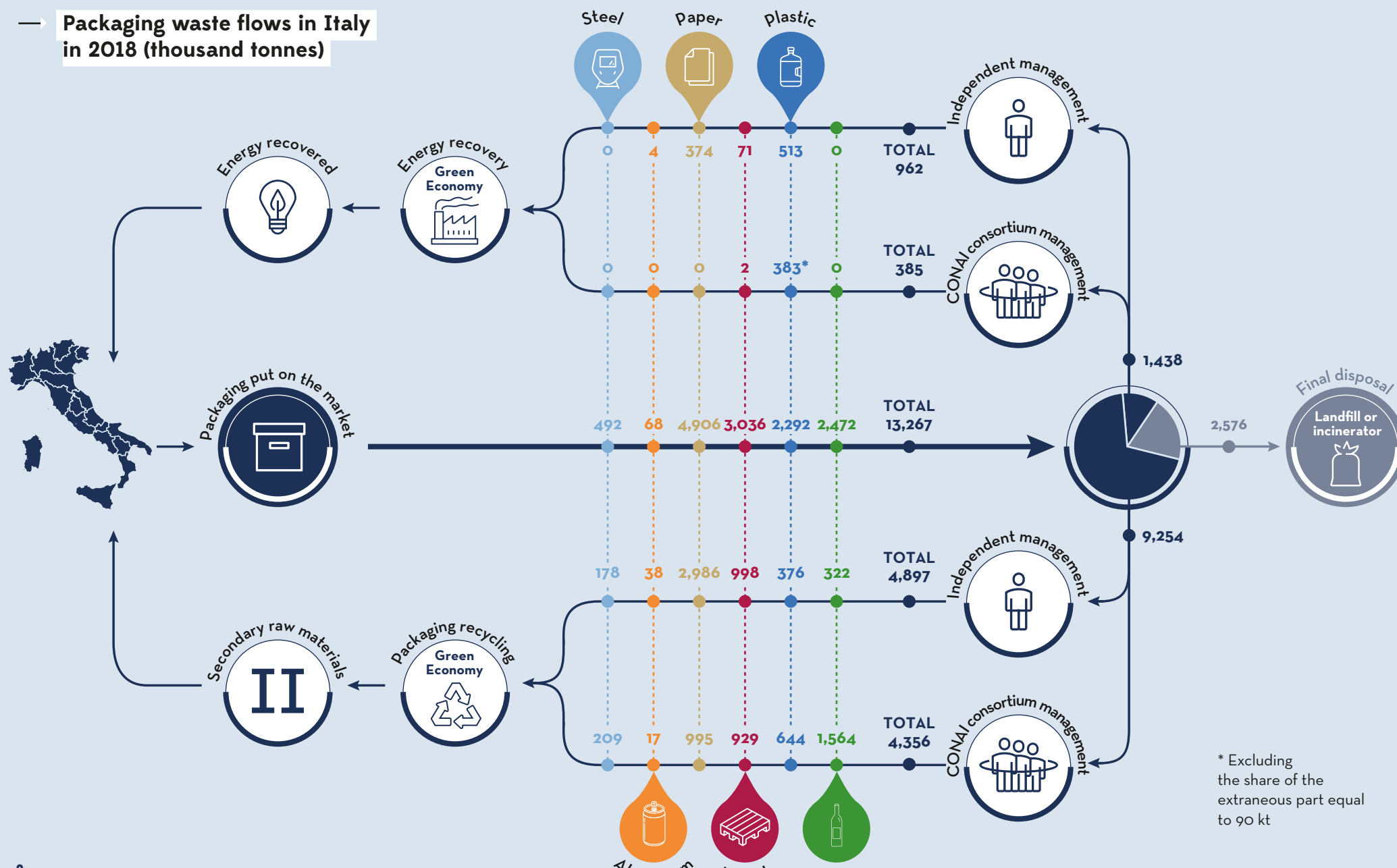
→ **Share of separate collection on total municipal waste collected from 2001 to 2017 (% and thousand tonnes)**



Source: ISPRA



→ Packaging waste flows in Italy  
in 2018 (thousand tonnes)





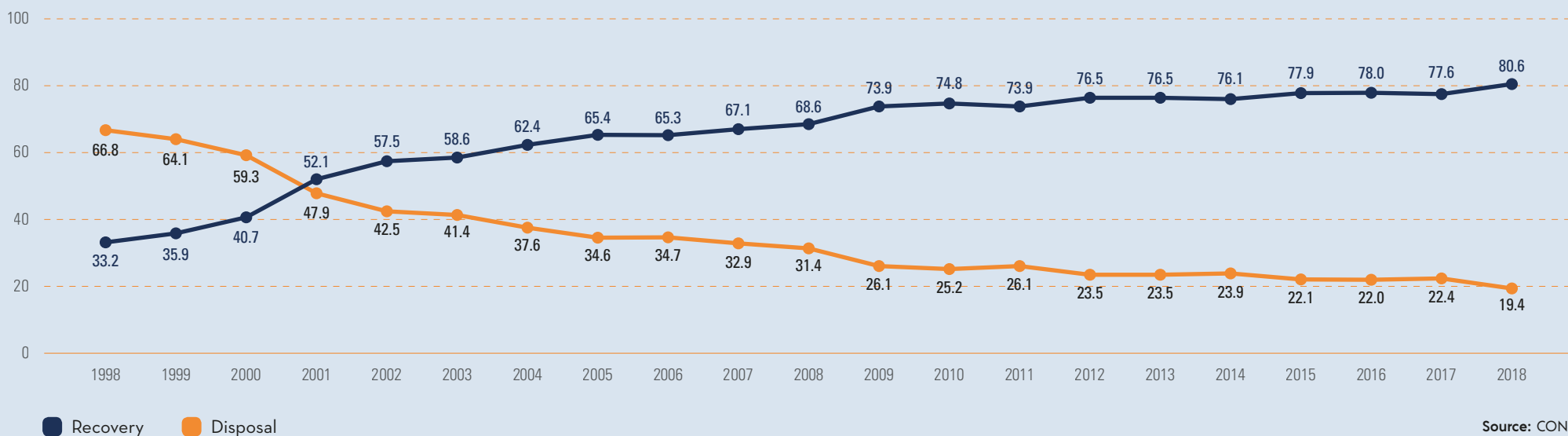
## PACKAGING WASTE MANAGEMENT IN ITALY

Since their inception, the mission of CONAI and the Supply Chain Consortia has been to promote the transition from a waste management model based on a linear approach to one based on recovery, consolidating the so-called "recycling society" based on the circular economy model. Over the years, CONAI and the Supply Chain Consortia have operated in compliance with this objective, so much so that from 1998 to 2018, recourse to landfills for the disposal of packaging waste in Italy went from 67% to 19%, respectively. The recovery rate

of packaging compared to the amount put on the market is steadily increasing and the target of recovering 60% of packaging waste put on the market by 31 December 2008, as provided for in Legislative Decree 152/06, was exceeded at least 3 years early.

In 2018, in fact, the recovery rate of packaging in Italy exceeded 80%, achieving a record high, and consequently the rate of disposal in landfills was at a record low.

### → Packaging waste recovered and disposed of in landfills in Italy from 1998 to 2018 (%)



Source: CONAI



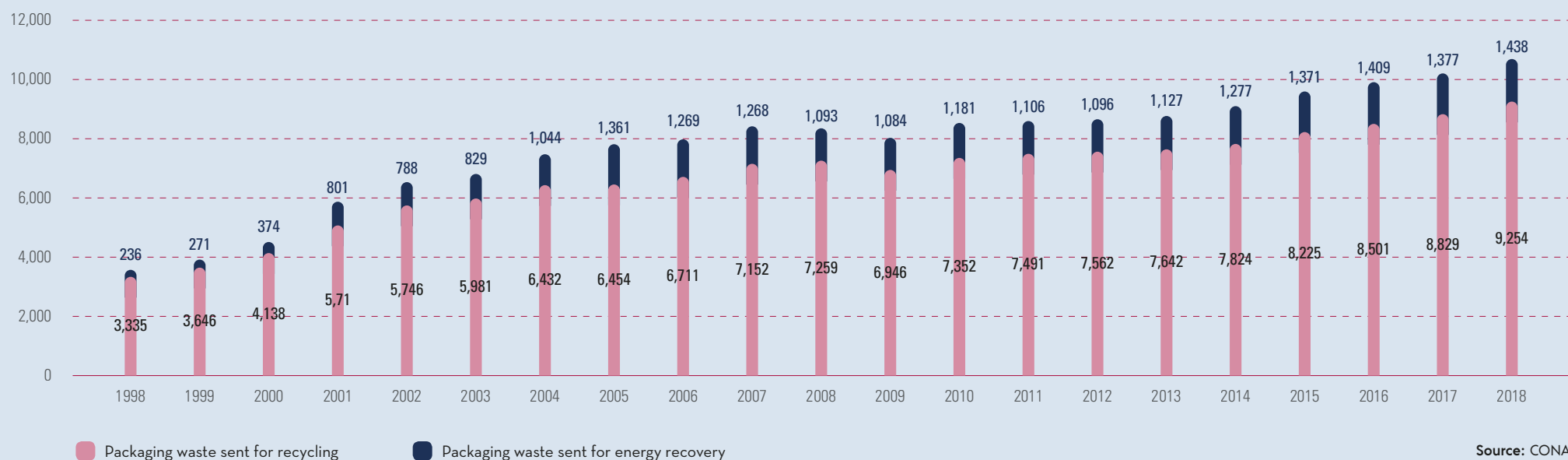
## RECYCLING AND ENERGY RECOVERY OF PACKAGING IN ITALY

The national performance in the recovery of packaging waste is jointly supported by management of the Supply Chain Consortia of the CONAI system and independent operators (private entities that collect and manage packaging waste generated mainly on private premises from industrial and commercial circuits).

In 2018, the total amount of packaging sent for recovery in Italy amounted to 10.7 million tonnes, a figure which has been growing steadily over the years, with the exception of the two-year period 2008-2009 when, following the first effects of the economic crisis, there was a slight reduction related to the contraction in

the amount of packaging put on the market. Recycling has always been the main destination of recovery activity: in 2018, 87% (over 9 million tonnes) of the quantities recovered were sent for recycling, while the remaining 13% (1.4 million tonnes) were used for energy recovery. Paper and cardboard accounts for 43% of packaging waste sent for recycling in Italy, followed by glass and wood (both approx. 20%). For energy recovery, the incidence of plastic packaging is predominant with more than 68% of the total quantities sent for energy recovery (these are mainly mixed plastics that are currently difficult to recycle).

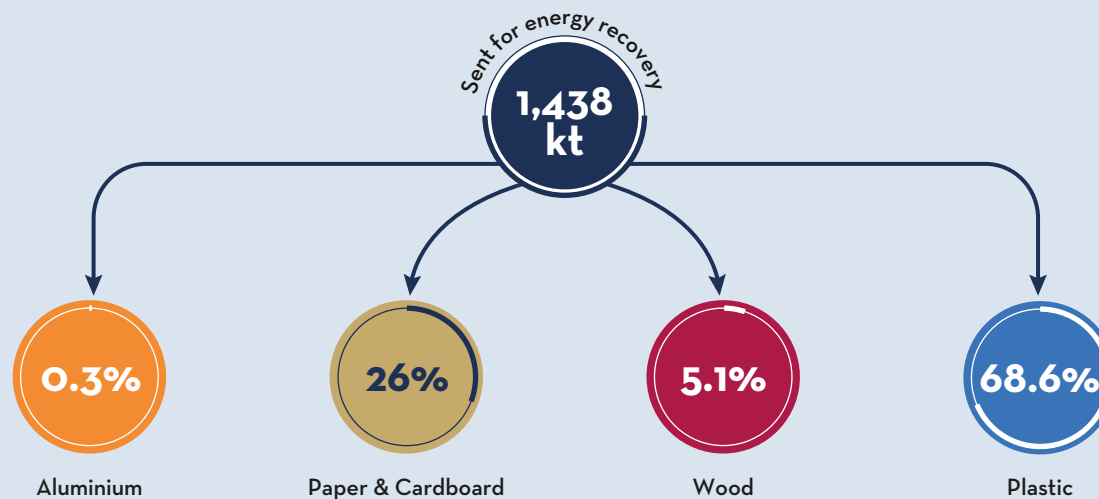
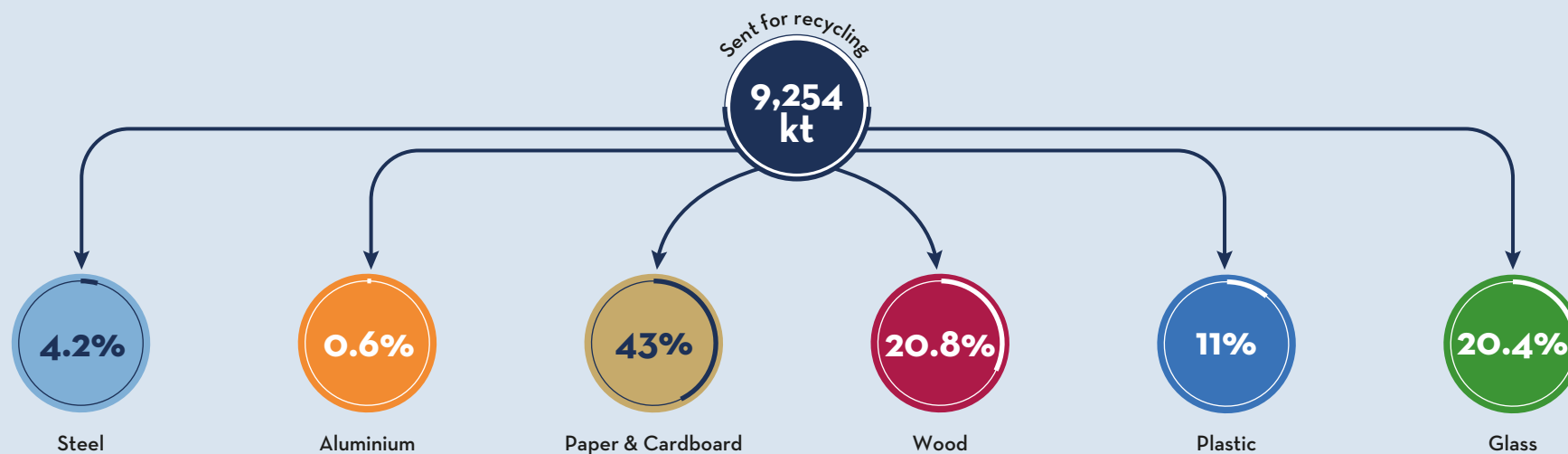
### → Packaging waste sent for recovery in Italy from 1998 to 2018 (thousand tonnes)



Source: CONAI



→ Breakdown of packaging waste sent for recycling and energy recovery by supply chain in Italy in 2018 (thousand tonnes and %)



Source: CONAI



## CONSORTIUM AND INDEPENDENT RECYCLING IN ITALY

Prior to Legislative Decree 22/1997, separate collection was not widespread and the recycling of packaging, almost exclusively linked to secondary and tertiary packaging, came from commercial and industrial activities.

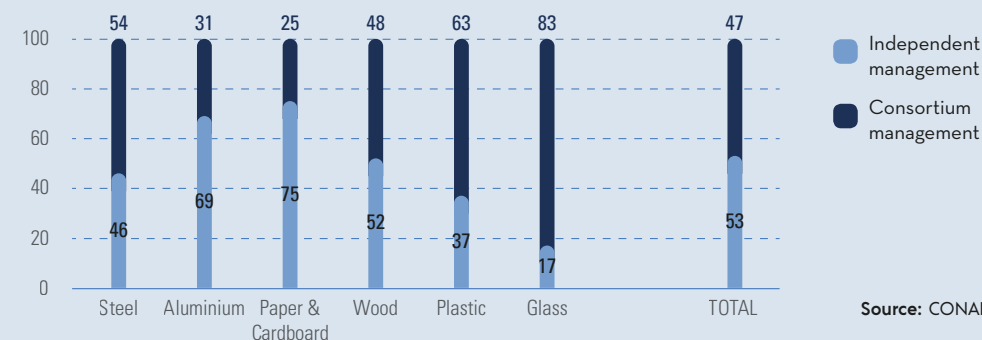
Thanks to the activities of CONAI and the consortia, since 1998 the share of municipal waste consisting of the packaging of the six materials has also found its way to recycling and, residually, to thermal energy recovery.

Over the years, both the quantities sent for recycling by independent management and those by consortium management have grown, but the change in pace in the last two decades has been due to the latter: in fact, of the approximately 6 million tonnes more packaging sent for recycling between 1998 and 2018, 70% is represented by the quantities managed by the consortium supply chain and deriving from municipal solid waste, a process that is transforming urban areas into metropolitan mines. In 2018, consortium management accounted for 47% of total packaging waste sent for recycling. With reference to the individual packaging materials, CONAI and consortium management represents the majority of the quantities sent for recycling at national level for glass, plastic and steel, while

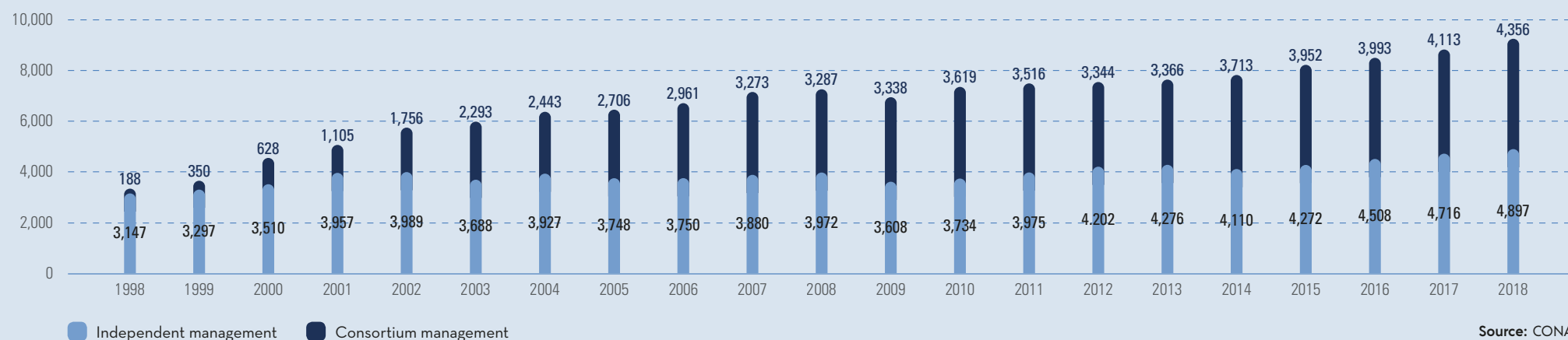
for wood, aluminium and paper, more than half of the recycling passes through independent management.

It should be remembered that consortium management, which intervenes where the market alone does not guarantee environmental objectives, plays a subordinate role.

### Consortium and independent management of packaging waste sent for recycling in Italy in 2018 (%)



### Packaging sent for recycling by type of management from 1998 to 2018 (thousand tonnes)



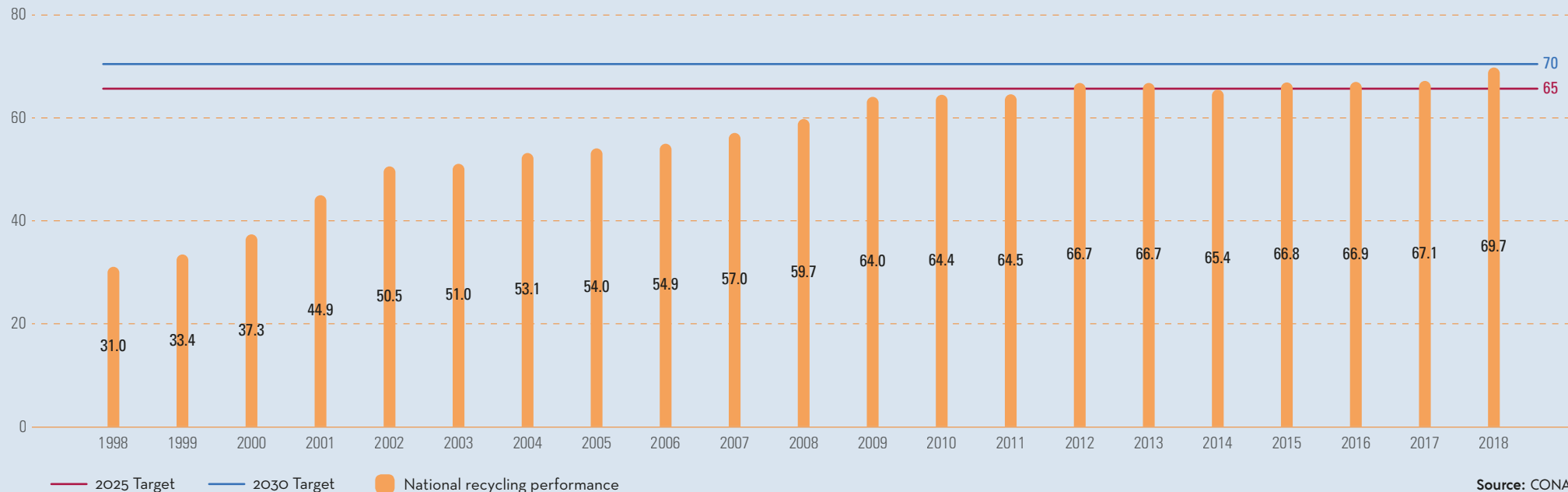


## RECYCLING TARGETS INTRODUCED BY THE NEW DIRECTIVE

The new package of European directives on the circular economy marks an important step forward for the packaging waste management system, setting new and more challenging recycling targets for 2025 and 2030, which require greater efforts both on the part of producers and users in order to increase, for example, recyclability, as well as on the part of the packaging waste recovery chain in order to improve the technologies used and increase the recycling yield of the materials processed.

Italy, with 69.7% of recycling compared to that put on the market achieved in 2018, has already exceeded the new European target set for 2025 (already exceeded in 2012 with a recycling rate of 66.7%) and is less than one percentage point from the 2030 target of 70%.

### → Share of packaging sent for recycling compared to that put on the market in the period 1998-2018 in relation to the targets of the circular economy package (%)



Source: CONAI

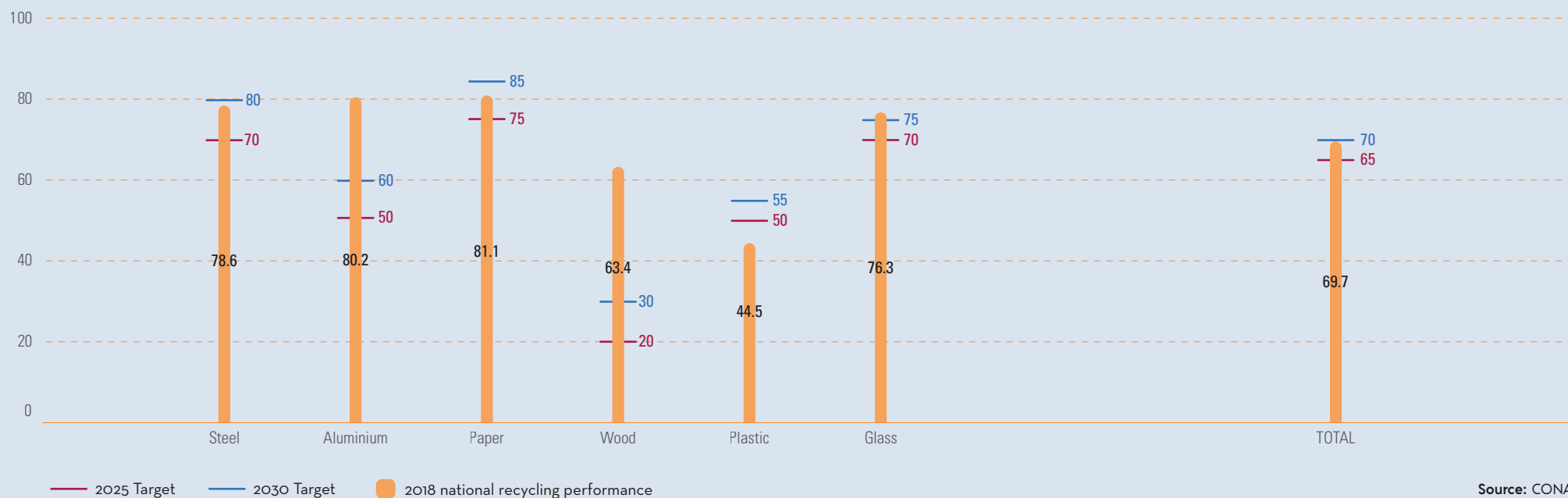


## RECYCLING TARGETS INTRODUCED BY THE NEW DIRECTIVE

The supply chain recycling targets for 2025 have also been exceeded: 78.6% by weight for steel, 81.1% for paper, 76.3% for glass, 80.2% for aluminium and 63.4% for wood. Moreover, aluminium, wood and glass have already exceeded their respective targets for 2030. The recycling percentage of plastic packaging, equal to 44.5%, is, on the other hand, lower than the target of 50% set for 2025

and 55% for 2030, but shows significant growth rates, linked to the continuous development of SC and to the evolution of recovery technologies of a relatively young supply chain compared to the others, also subject to further specific targets (rate of interception of bottles, use of MPS and recyclability).

### → Recycling rates of packaging waste by supply chain in 2018 in relation to 2025 and 2030 targets (%)



Source: CONAI

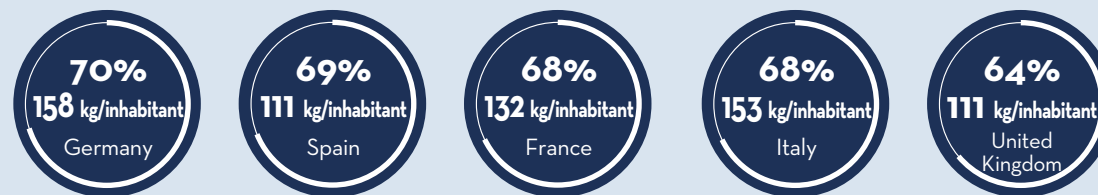


## PACKAGING WASTE RECYCLING IN EUROPE

A comparison between the Italian situation and that of some of the most significant Member States, and taking into account the limits connected with the application of calculation methods that are not always homogeneous, shows that the initial situation (in 1998) was heterogeneous and very different from the current one: in particular, Germany already had very high recycling rates, exceeding 80%, while other countries were at much lower levels: United Kingdom 28%, Italy 32%, Spain 34%, France 42%. After 20 years there have been significant changes, with significant growth in recycling rates in all major European economies (with the exception of Germany, which shows a decrease of approx. 10 percentage points, while still leading the virtual European ranking). Italy has shown the most significant progress: the increase in weight of packaging sent for recycling between 1998 and 2017\* is approx. +170%. After Germany, of the 5 main European economies, Italy, with 153 kg/inhabitant, is now the country with the highest recycling value per capita, the European average being 116 kg/inhabitant.

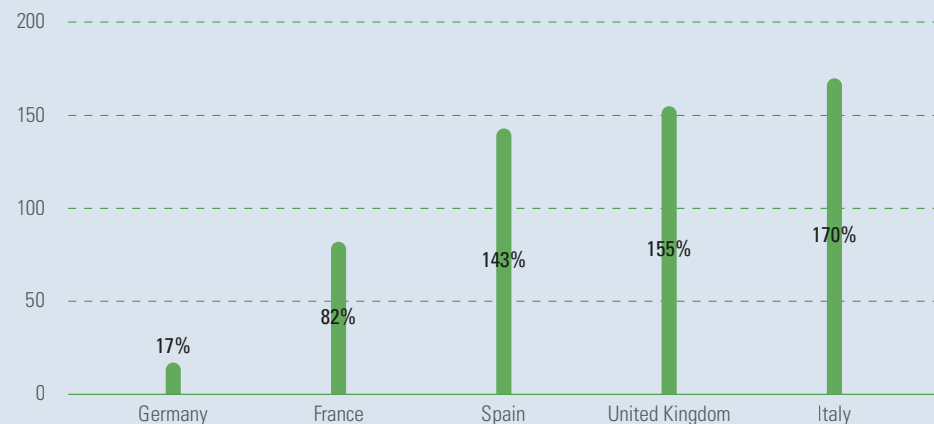
\*last official figure available

### Percentage of packaging waste sent for recycling and per capita recycling of packaging in the main European countries in 2017



Source: EUROSTAT

### Change in packaging waste sent for recycling in the main European countries between 1998 and 2017 (%)



Source: EUROSTAT



# THE ENVIRONMENTAL AND SOCIO-ECONOMIC BENEFITS OF CONAI AND SUPPLY CHAIN CONSORTIA

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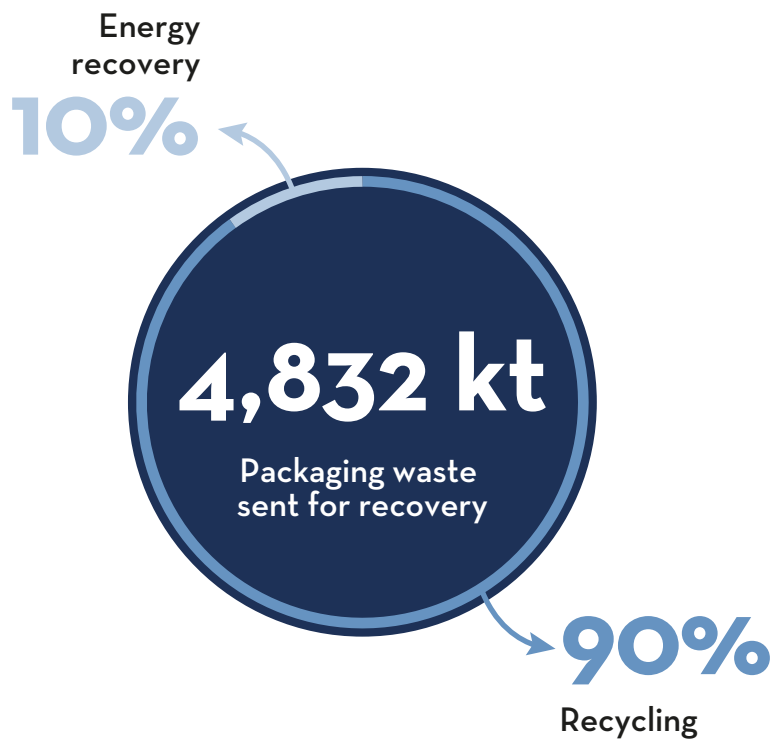
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## NUMBERS OF CONAI-SUPPLY CHAIN CONSORTIA MANAGEMENT IN 2018

→ Packaging waste disposed of under the ANCI-CONAI agreement  
by macro geographic area (thousand tonnes and kg/inhabitant)





399 Eiffel Towers

**4,029**  
kt

Raw material saved

the average annual electrical consumption of primary energy  
of 5.6 million Italian households

**21**  
TWh

Primary energy saved thanks to recycling

emissions generated by 9 thousand  
Rome-New York round-trip flights

**3,971**  
ktCO<sub>2</sub>eq

Emissions avoided thanks to recycling

**29**  
Mln €

Economic value of energy produced from recovery

**412**  
Mln €

Economic value of the material recovered thanks to recycling

**113**  
Mln €

Economic value of the CO<sub>2</sub> avoided thanks to recycling

**554**  
Mln €

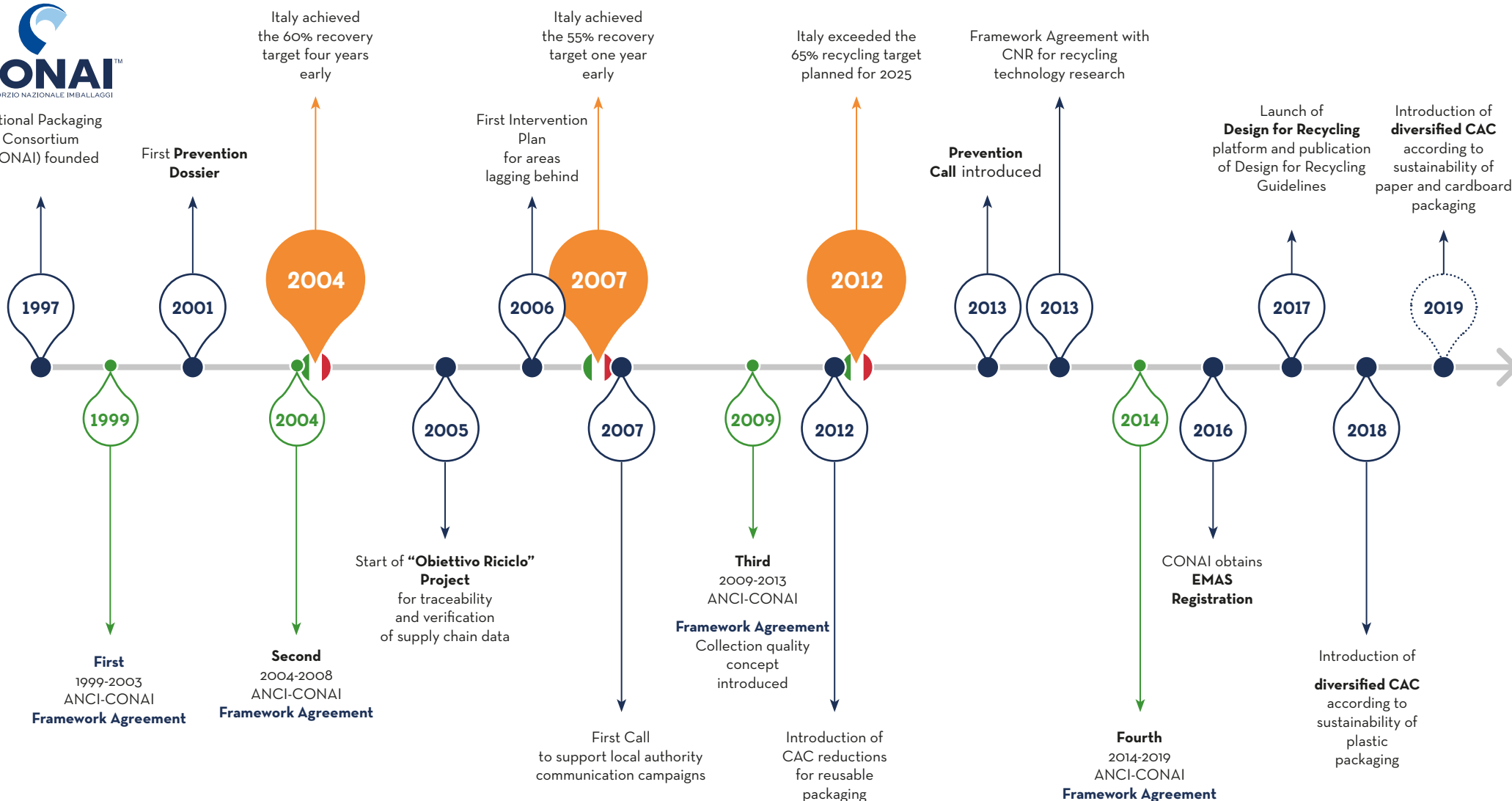
Economic repercussions generated by the supply chain



## → National Packaging Consortium history



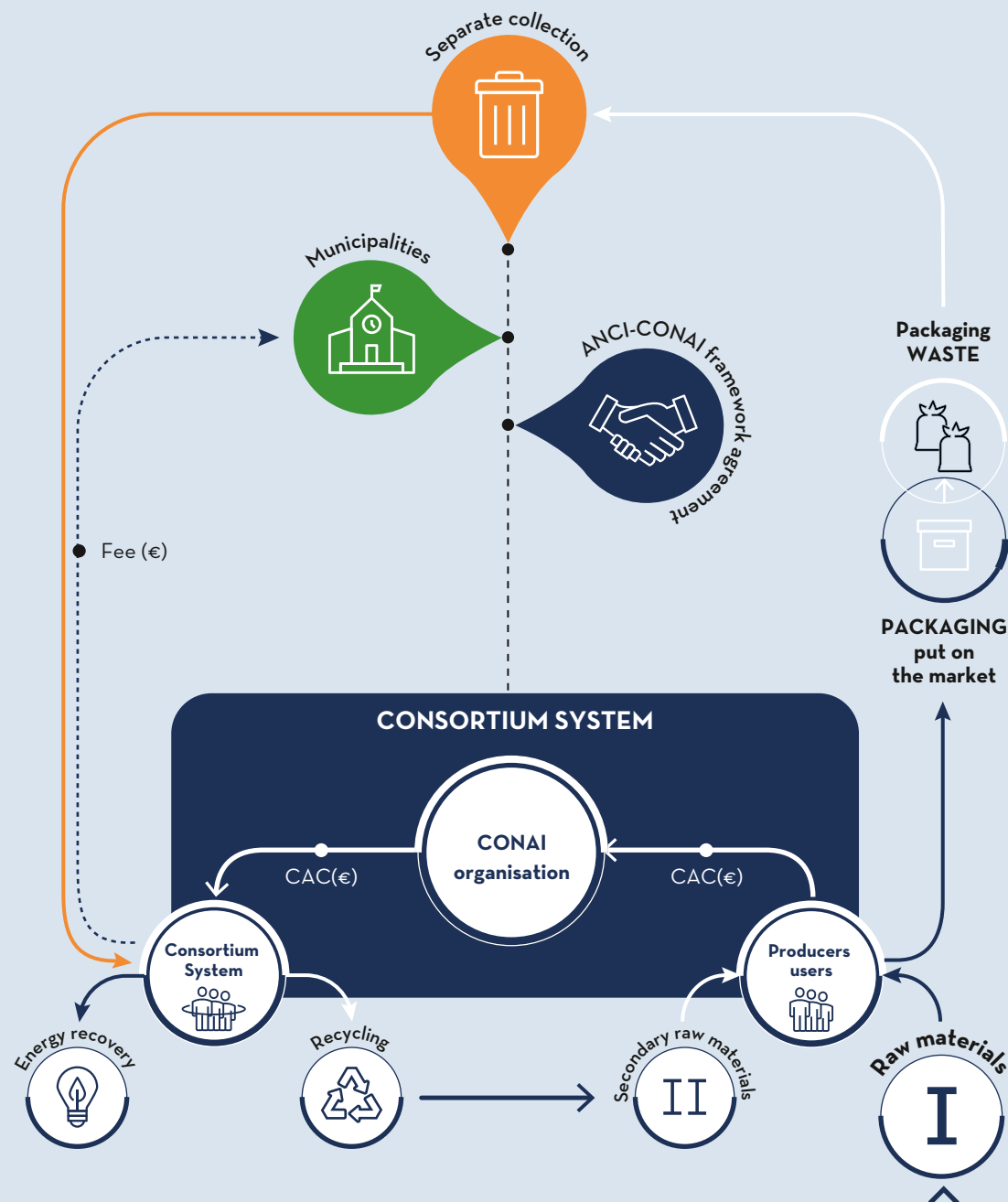
National Packaging  
Consortium  
(CONAI) founded





## HOW THE CONSORTIUM SYSTEM WORKS

The foundation of CONAI marked the transition from a management system based on landfills to an integrated system, based on prevention and on packaging recovery and recycling. The Consortium members consist of packaging producers and users which, by paying the CONAI Environmental Contribution (CAC), in compliance with the so-called extended producer responsibility, cover the costs of collection, recovery and recycling of packaging put on the market, thus not increasing the price paid by citizens. Packaging producers are not obliged to join the Consortium: Legislative Decree 22/1997 for the management of packaging waste envisages that they can meet their obligations by organising themselves independently, provided that they ensure achievement of the targets set. In 2018, there were approx. 844,000 CONAI consortium members, of which only 1% were packaging producers, with the remainder consisting of users (such as importers or traders of goods already packaged, self-producers, traders of empty packaging, etc.). The CAC is used to finance the activities of CONAI and of the six supply chain consortia, starting with the promotion of Separate Collection (SC), through the fee paid to municipal administrations based on that established by the **Framework Agreement** periodically concluded between ANCI (National Association of Italian Municipalities) and CONAI. This Agreement is voluntary and operates in total subsidiarity with respect to the market, so also municipalities (or managers) can decide whether to adhere to it or operate independently.

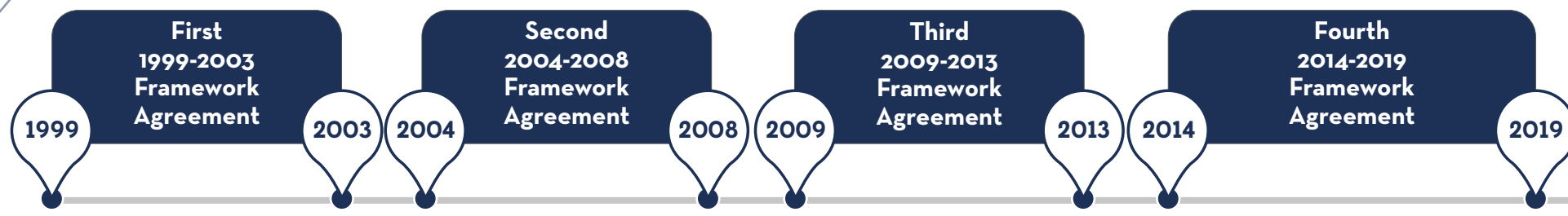




## THE ANCI-CONAI FRAMEWORK AGREEMENT

Everything, always and everywhere, in subsidiarity with respect to the market

# FOCUS



Agreements: collection fees and local communication support (SCC)

Pursuit of collection quality

Subsidiarity with respect to the market

“Universal” collection guarantee

Local communication (ANCI CONAI Call)

“Multimedia” management

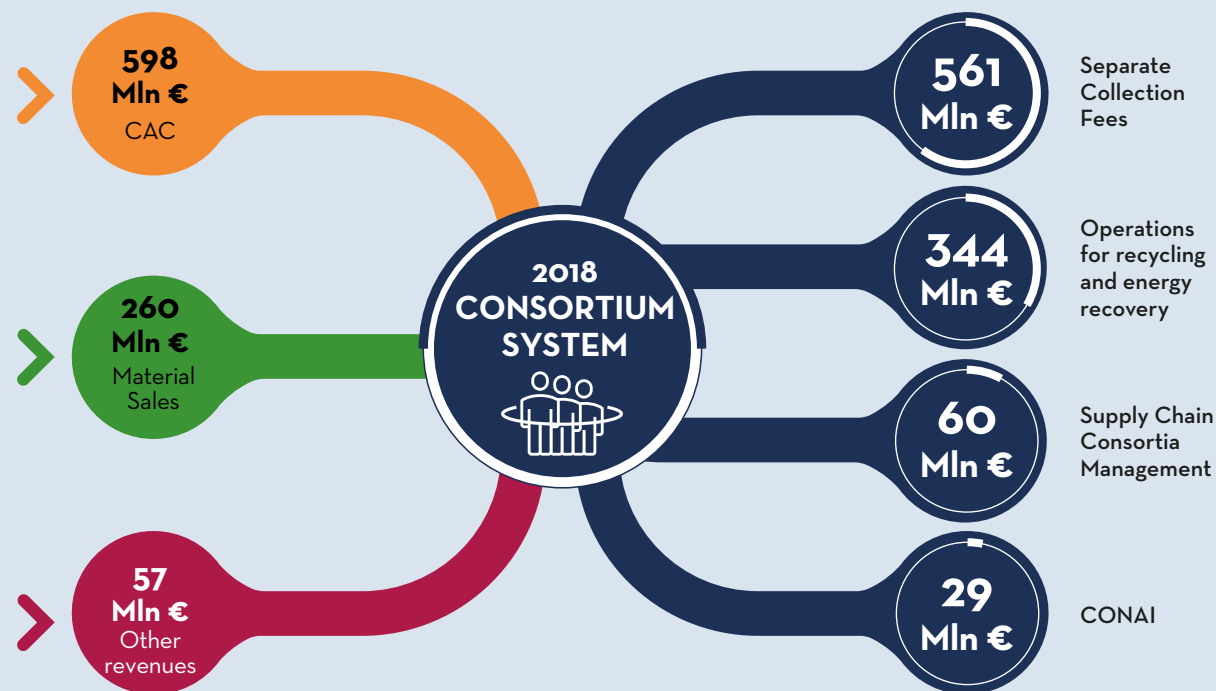
Support for “areas lagging behind”

ANCI CONAI Database and Observatory

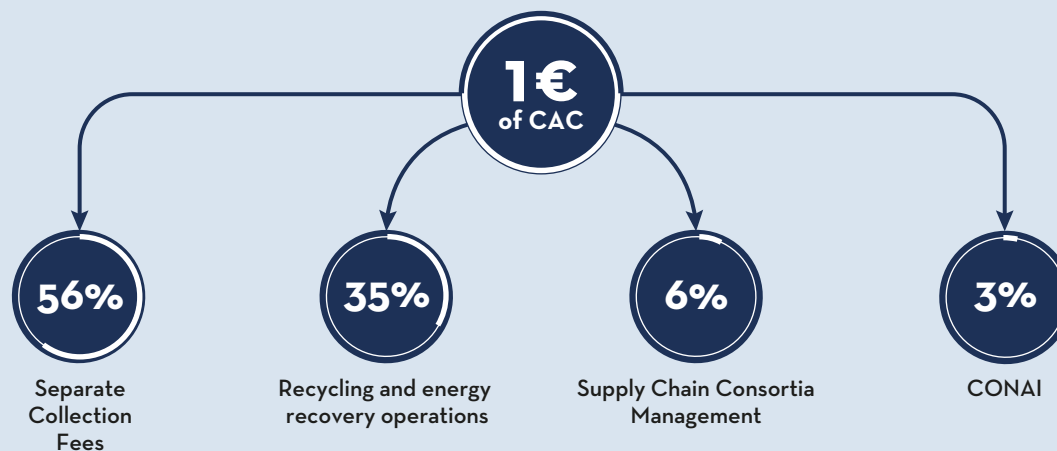


## ECONOMIC FLOWS OF THE CONSORTIUM SYSTEM

In 2018, the total economic flow generated by CONAI and Supply Chain Consortia amounted to approximately 915 million euros in revenues, almost two-thirds of which came from the CONAI Environmental Contribution and approximately 28% from the sale of secondary raw materials deriving from recycling activities. In the same year, operating costs amounted to 994 million euros, mainly to support separate collection in municipalities and recycling and recovery companies. The negative balance between revenues and costs that characterised 2018 was absorbed by the operating surpluses of previous years.



## → What is the €1 Environmental Contribution used for?



**DIVERSIFIED CAC**

# FOCUS

Separate collection is the main tool for the pursuit of recycling targets, but it is not enough on its own: currently, in fact, not all the packaging collected separately can be sent for recycling. For this reason, it is necessary to encourage innovative packaging design and production models on the part of producers and users, in order to make it increasingly easy to recycle.

In 2018, CONAI introduced a **diversified environmental contribution for plastic packaging** which provides for different contribution values according to the criteria of sortability, recyclability and the prevailing circuit of destination ("Household" or "Commerce & Industry"). The levels and packaging types included in them are obviously subject to updating on the basis of changes in packaging characteristics, as well as the technologies used in sorting and processing plants. In the first application, a criterion of gradualness was adopted, limiting the gap between the various contribution levels.

## → Contribution levels for plastic packaging in force in 2018

**LEVEL A (€179/t)**

Sortable and recyclable packaging  
from the "Commerce & Industry" circuit

**LEVEL B (€208/t)**

Sortable and recyclable packaging  
from the "Household" circuit

**LEVEL C (€228/t)**

Packaging not yet  
sortable/recyclable  
with current technologies

**DIVERSIFIED CAC**

# FOCUS

In the course of 2018, with the aim of making the distinction between sorted and recycled packaging solutions and those that are not yet so, a further step forward was taken by adopting an even clearer criterion of prevention, going beyond the logic of the predominant flow. Based on the detailed analysis carried out, from 1 January 2019 the latter has led to an increase in the contribution gap between the levels and a reclassification of packaging, starting with that of level B.

As of 1 January 2019, a new **diversification also for paper and cardboard packaging** was introduced, envisaging an additional contribution (an extra-CAC of €20/tonne) for poly laminated packaging suitable for containing liquids and more difficult to recycle, an additional contribution used to create a dedicated recycling chain.

From 1 January 2020, there will be an even more detailed diversification of contributions for plastic packaging, with the aim of introducing greater clarity between the packaging solutions that are actually recycled and those that still are not.

## → Contribution levels for plastic packaging in force in 2019

**LEVEL A (€150/t)**

Sortable and recyclable packaging from the "Commerce & Industry" circuit

**LEVEL B1 (€208/t)**

Packaging from the "Household" circuit with an effective and consolidated sorting and recycling chain

**LEVEL B2 (€263/t)**

Other sortable and recyclable packaging from the "Household" circuit

**LEVEL C (€369/t)**

Packaging currently not sortable/recyclable

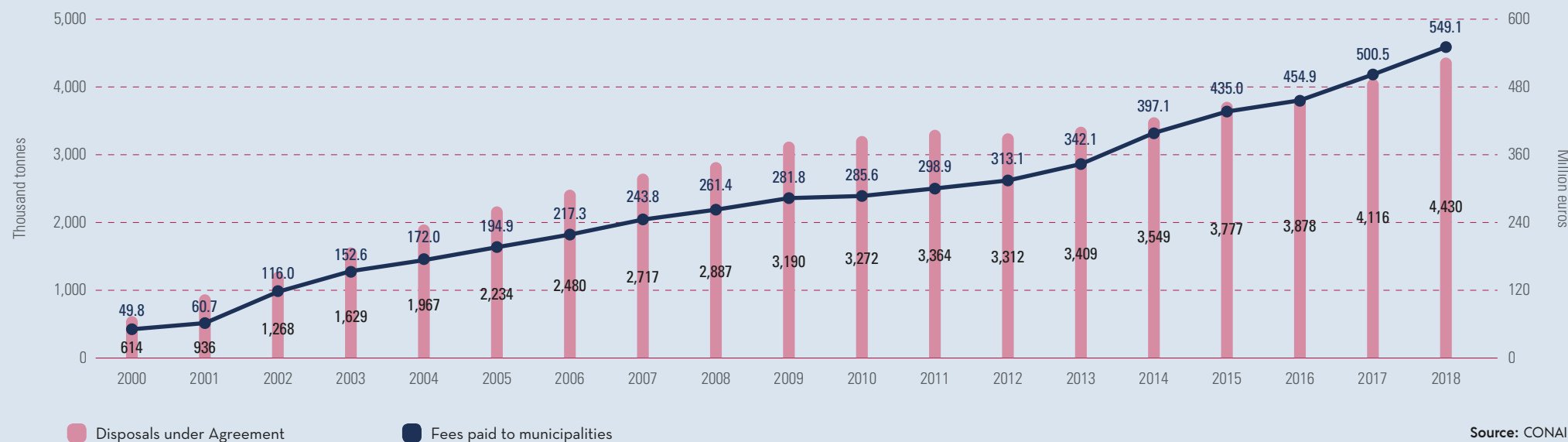


## CONAI SUPPORT FOR SEPARATE COLLECTION

The fee paid to the Municipalities by the Supply Chain Consortia is the tool through which CONAI promotes the growth of SC of packaging waste. The amount of the fees paid to the municipalities affiliated with Supply Chain Consortia, for the packaging waste disposed of, increased from 49 million euros in 2000 to 549 million euros in 2018, a more than 11-fold increase. Overall, from 2000 to 2018, the system paid more than 5 billion euros to municipalities, with a constant growth trend over the years.

Also the quantities of packaging waste disposed of by affiliated municipalities increased, from 614 thousand tonnes to over 4.4 million tonnes between 2000 and 2018, a 7-fold increase. Even in the midst of the economic crisis, the collection of waste from SC and the corresponding financial payments to municipalities continued to grow, despite the contraction of the market for secondary raw materials and the lower income from environmental contributions related to the fall in the amount put on the market.

### → Fees paid to municipalities and packaging disposed of under affiliation from 2000 to 2018 (million euros and thousand tonnes)

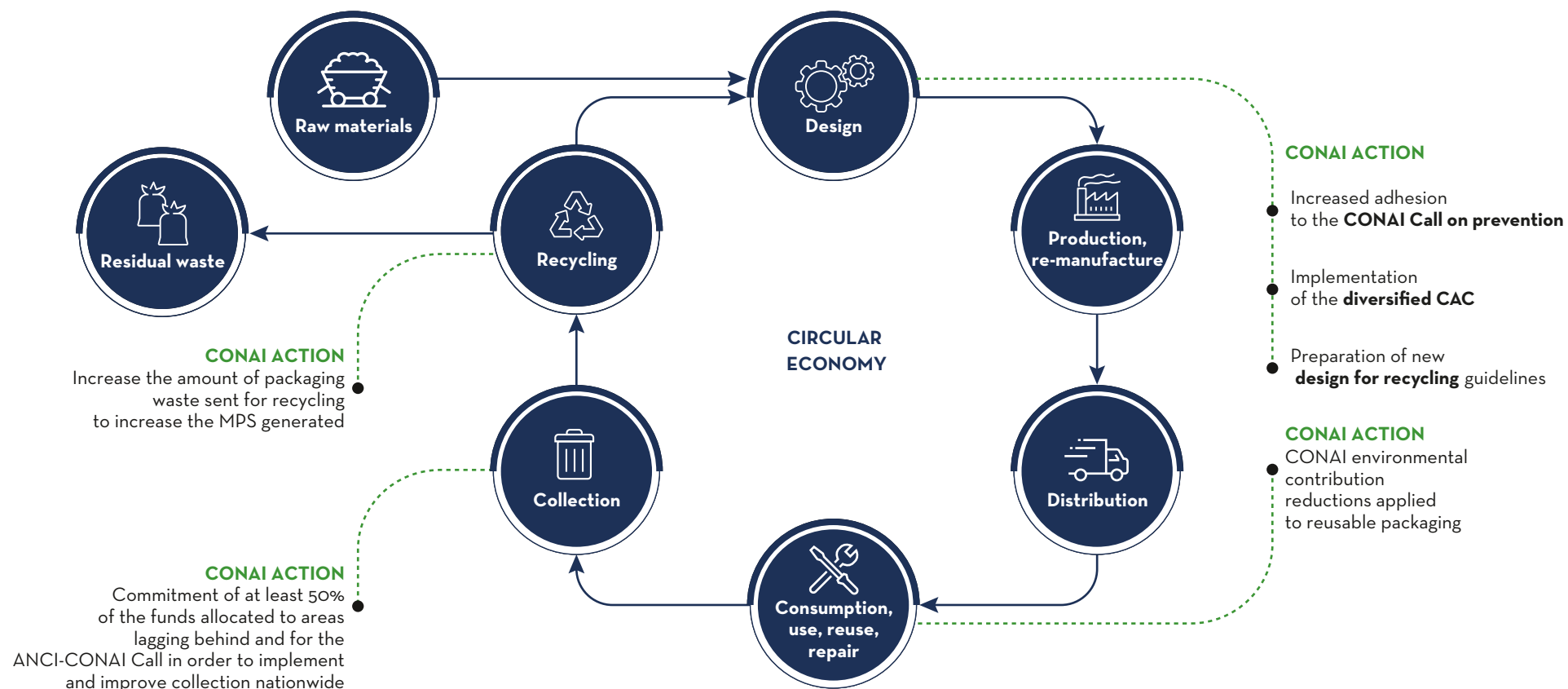


Source: CONAI



## CONAI COMMITMENTS FOR THE CIRCULAR ECONOMY

# FOCUS





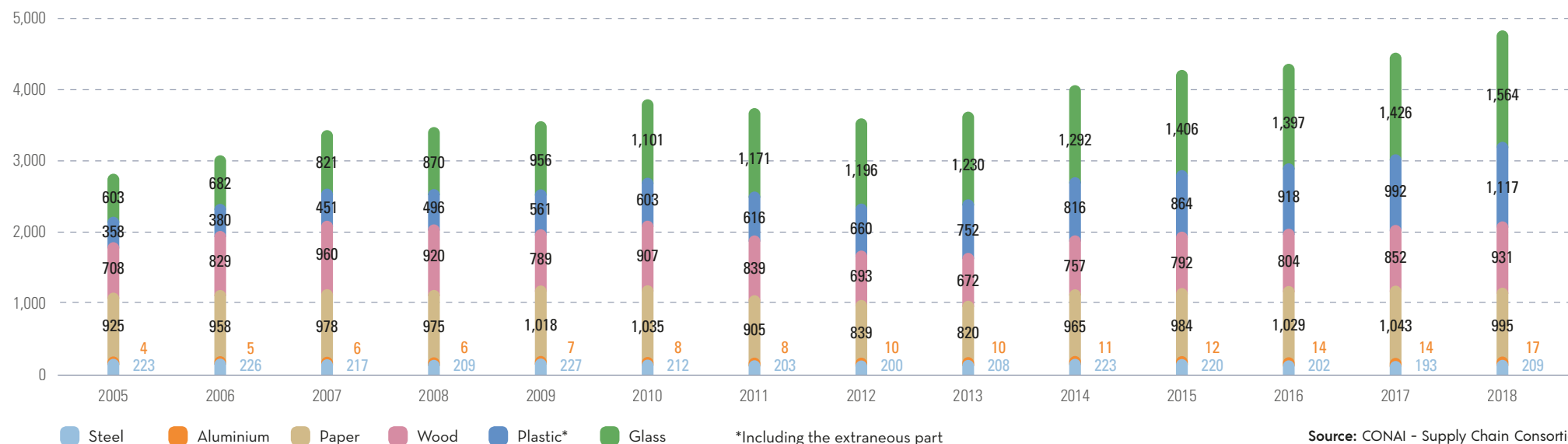
## MANAGEMENT OF PACKAGING SENT FOR RECOVERY BY THE CONSORTIUM SYSTEM

In 2018, packaging sent for recovery by the Consortium System amounted to 4.8 million tonnes, 90% of which was recycled and the remaining 10% used for energy recovery. Glass is the most important material in terms of weight, with approx. 1.6 million tonnes of packaging waste sent for recovery, followed by plastic, paper and wood, in this order, each around one million tonnes. Finally, the contributions of metal packaging waste, with approx. 200 thousand tonnes of steel and 17 thousand tonnes of aluminium.

Following a slight decrease recorded during the 2008-2009 crisis, starting in 2013, packaging sent for recovery in Italy by the CONAI-Supply Chain Consortia system

returned to growth in absolute value, mainly thanks to glass and plastic which, in the same period (2008-2013), saw an increase in packaging waste sent for recycling and energy recovery of 41% and 51%, respectively. It is worth noting that, in recent years, there has been a constant increase in the share of packaging waste, particularly plastic, sent for energy recovery (475 thousand tonnes in 2018 compared to 115 thousand tonnes in 2005): this figure, although it has not hindered the growth in absolute value of the quantities sent for recycling, should nevertheless represent an important stimulus for the country to invest more to increase the quality of separate collection and internal demand for recycled materials.

### → Packaging waste sent for recovery by consortium management from 2005 to 2018 (thousand tonnes)



Source: CONAI - Supply Chain Consortia



## CONAI COMMITMENT TO DATA RELIABILITY AND TRANSPARENCY

# FOCUS

In 2005, CONAI launched a voluntary project, called “Obiettivo riciclo” (Objective: Recycling), aimed at determining and validating, by a third party, the data concerning that put on the market, recycling and recovery for all packaging material flows. This activity involves CONAI, the Supply Chain Consortia, the Conip Consortium and a certification body, as well as a team of specialists for each material. The parties participating in the project are subject to documentary verification and compliance with certain quality criteria, in addition to a series of checks directly at the plant.

“Obiettivo riciclo” has provided a solid database and primary information, starting from which, in 2015, a Life Cycle Costing (LCC) methodology was developed which, through a tool specially developed and updated every year, quantifies and monitors the (direct and indirect) environmental and economic benefits generated by the recycling of packaging waste in Italy.

### → Performance indicators of the LCC Tool

#### RECOVERY OF MATERIAL AND ENERGY

- ▶ material recovered from recycling
- ▶ electricity generated from energy recovery
- ▶ thermal energy generated from energy recovery

#### ENVIRONMENTAL BENEFITS

- ▶ raw material saved due to recycling
- ▶ primary energy saved due to recycling
- ▶ CO<sub>2</sub> generation avoided due to recycling
- ▶ CO<sub>2</sub> generation avoided due to energy recovery

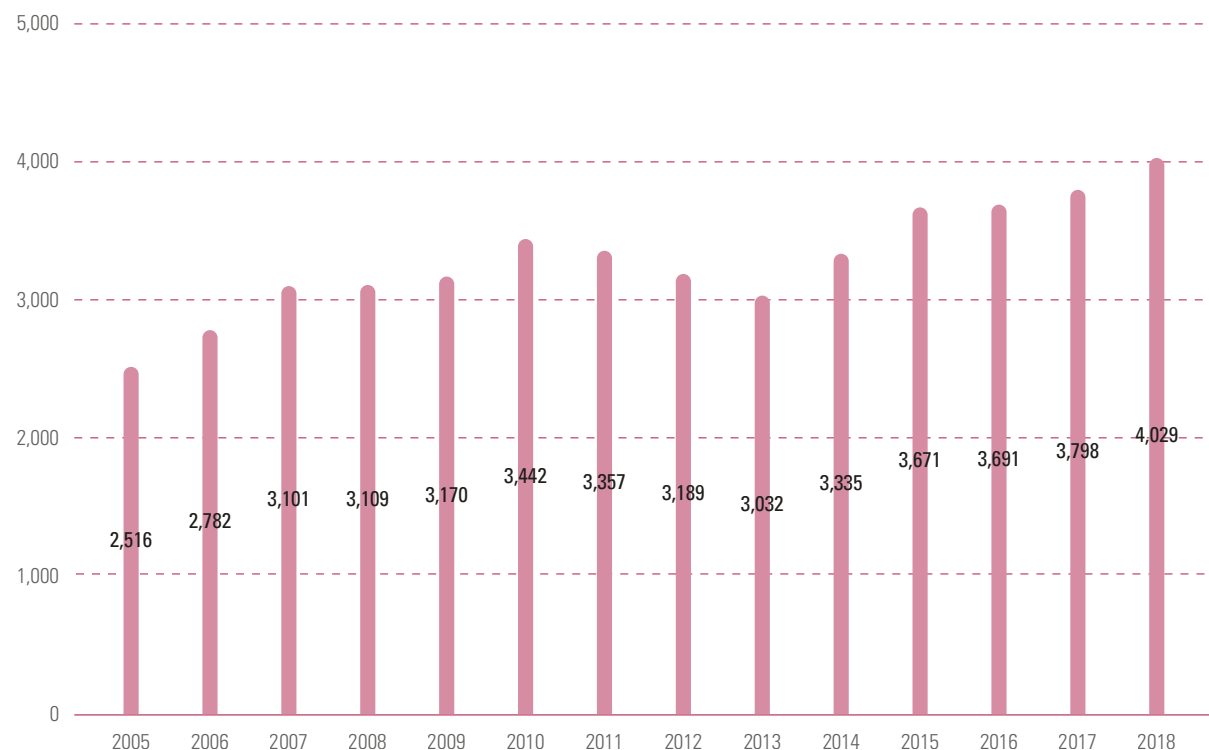
#### LIFE CYCLE COSTING

- ▶ direct System costs
- ▶ direct benefits: economic value of the material recovered from recycling; economic value of electricity and heat generated from energy recovery; economic repercussions generated by the system;
- ▶ indirect benefits: economic value of the CO<sub>2</sub> avoided due to recycling and energy recovery.



## THE BENEFITS OF RECYCLING: MATERIALS SAVED

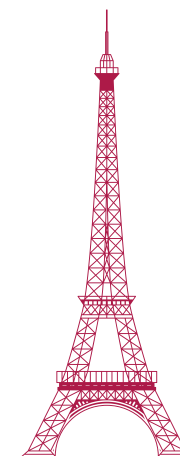
→ Raw materials saved thanks to consortium management recycling from 2005 to 2018 (thousand tonnes)



Source: CONAI

In 2018, packaging waste sent for recycling by the Consortium System

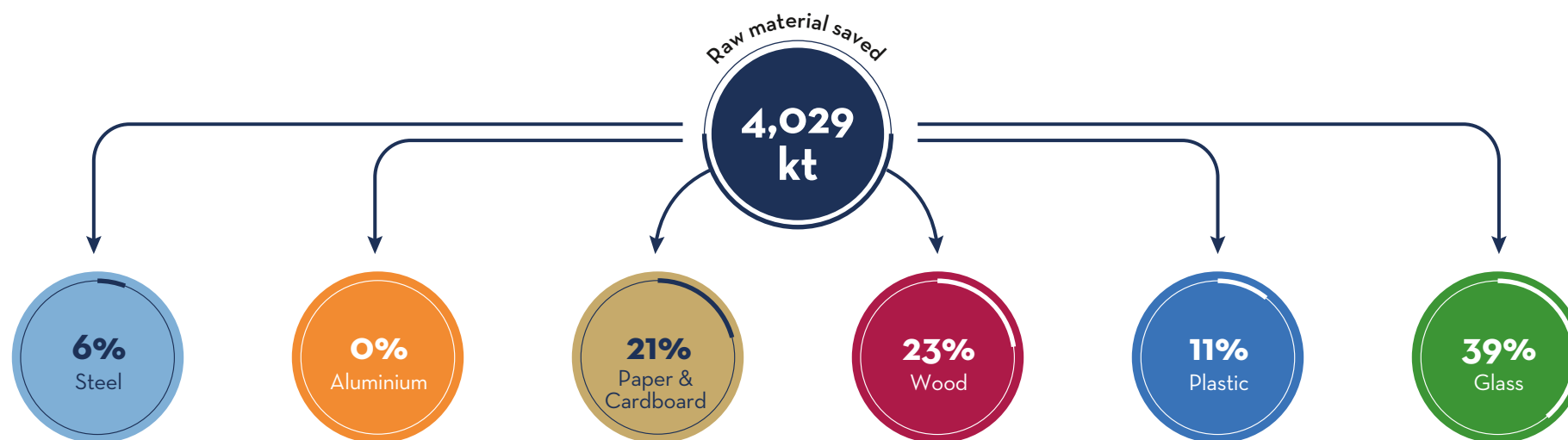
**avoided the consumption of over 4 million tonnes of virgin raw materials equal to the weight of 399 Eiffel towers**





## THE BENEFITS OF RECYCLING: MATERIALS SAVED

→ Percentage of raw material saved through recycling by material in 2018



Source: CONAI

Using the **LCC Tool**, it is possible to measure the quantity of materials deriving from virgin raw materials saved over their entire life cycle thanks to the use of secondary raw materials obtained from waste sent for recycling by the various CONAI supply chains. This value is calculated, in particular, by estimating the material that would have been necessary to construct a new packaging equivalent to one made entirely of secondary raw material resulting from the activities of the CONAI supply chains.

This benefit has increased over time, first of all thanks to the growth of recycling

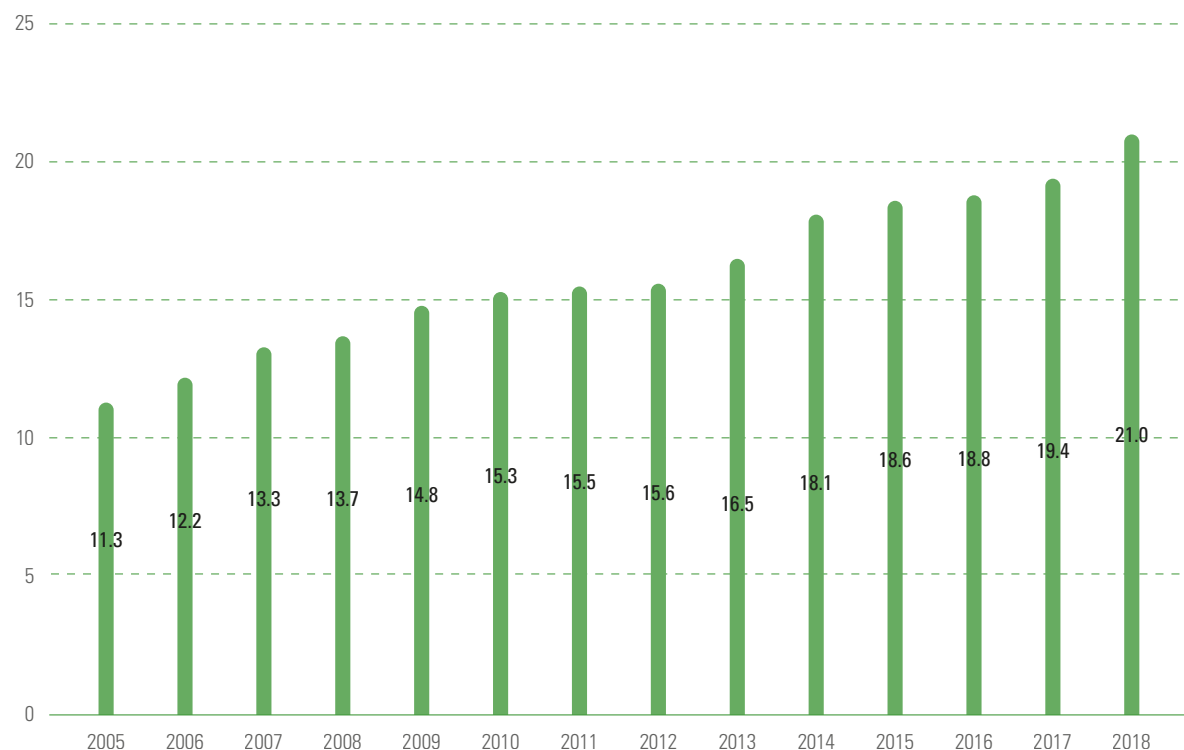
in Italy ensured by CONAI, from approx. 2.5 million tonnes of materials saved in 2005 to over 4 million tonnes in 2018, and generating a cumulative saving over the entire period of over 46 million tonnes of primary material.

In 2018 alone, 39% of this benefit for the country was attributable to the secondary raw material produced by the recycling of glass packaging waste, followed by that of wood, paper and cardboard, both just over 20%, plastic, with 11%, and metal for the residual part.



## THE BENEFITS OF RECYCLING: ENERGY SAVED

→ Primary energy saved thanks to consortium management recycling from 2005 to 2018 (TWh)



Source: CONAI

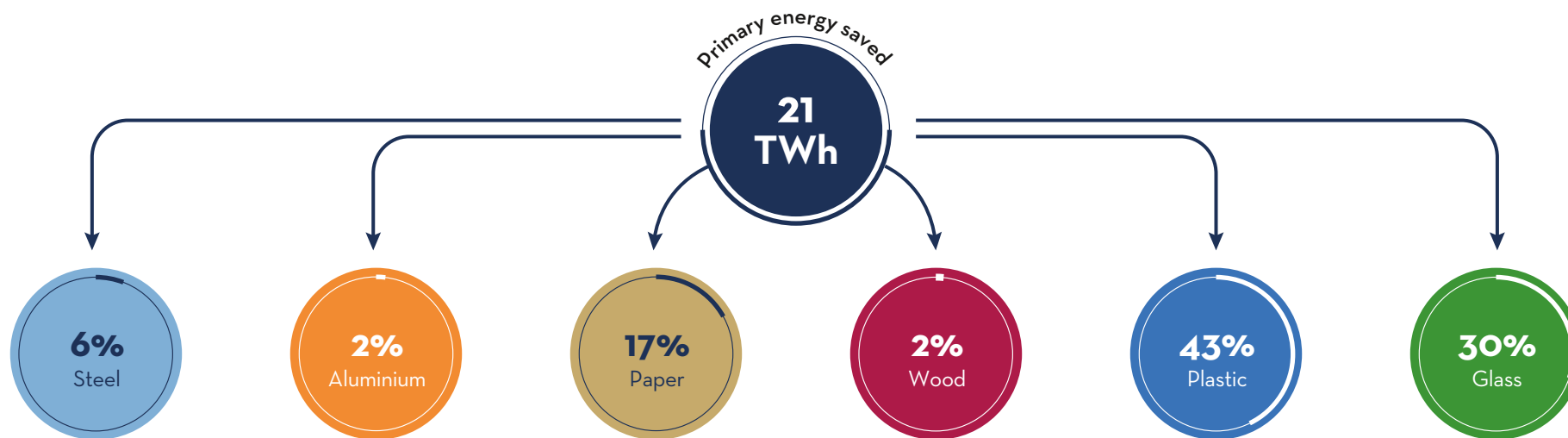
In 2018, packaging waste sent for recycling by the Consortium System **avoided the consumption of over 21 TWh of primary energy** equal to the average annual electric consumption of primary energy (for domestic use) of **5.6 million Italian households**





## THE BENEFITS OF RECYCLING: ENERGY SAVED

→ Percentage of primary energy saved through recycling by material in 2018



Source: CONAI

The primary energy saved through recycling corresponds to the amount of energy from fossil sources that has not been consumed thanks to the use of secondary raw material to create a good, instead of materials derived from virgin raw material. Compared to 2005, energy savings from packaging recycling managed by Conai also increased significantly, +86% in 2018. Overall, between 2005 and 2018, packaging recycling by the Consortium System allowed Italy to avoid the consumption of approx. 224 TWh of primary energy, recording a constantly growing trend, even during the economic slowdown and partial reduction of the quantities of packaging waste put on the market. Unlike the first material savings indicator,

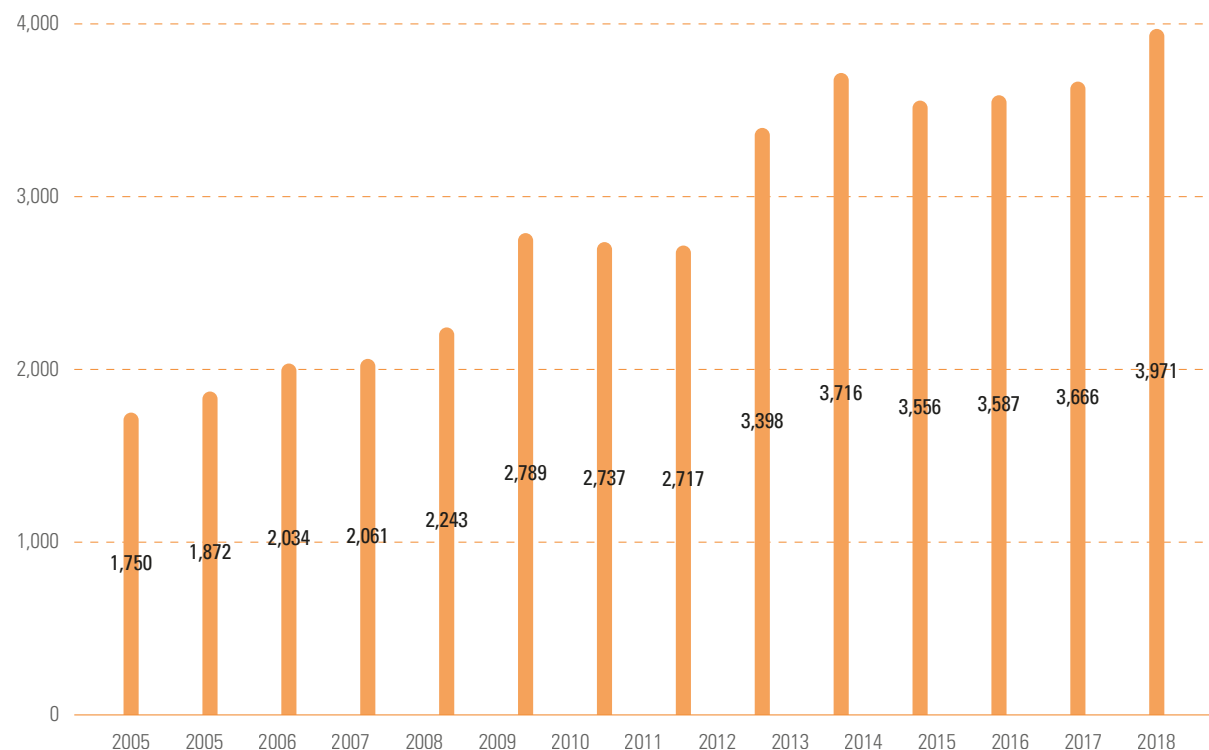
glass is the second largest contributor to the generation of the environmental benefit, while the largest contribution to overall primary energy saved through recycling is plastic with a share of 43%.

Not all sorted packaging waste is suitable for recycling, in which case the preferred destination should be energy recovery for the production of electricity and heat. In the CONAI-Supply Chain Consortia system, plastic packaging waste is mainly sent to this destination, which in 2018 generated approx. 0.13 TWh of electricity and 0.27 TWh of thermal energy, thus avoiding the consumption of fossil fuels.



## THE BENEFITS OF RECYCLING: GREENHOUSE GAS EMISSIONS AVOIDED

→ Greenhouse gas emissions avoided thanks to consortium management recycling from 2005 to 2018 (thousand tonnes of CO<sub>2</sub>eq)



Source: CONAI

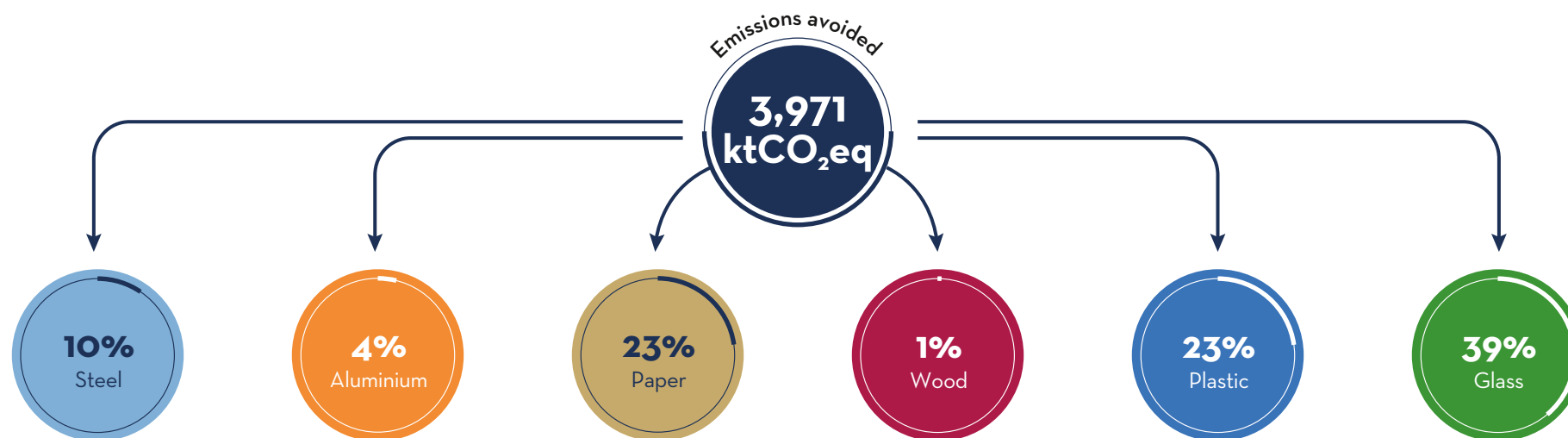
In 2018, packaging waste sent for recycling by the Consortium System **avoided emission into the atmosphere of almost 4 million tonnes of CO<sub>2</sub>eq** equal to the emissions generated by **9 thousands Rome-New York round-trip flights**





## THE BENEFITS OF RECYCLING: GREENHOUSE GAS EMISSIONS AVOIDED

→ Percentage of emissions avoided through recycling by material in 2018



Source: CONAI

The recycling sector also makes an important contribution to combating climate change and reducing greenhouse gas emissions. This indicator measures emissions avoided, calculated in CO<sub>2</sub> equivalent (CO<sub>2</sub>eq), applying specific emission factors to the materials saved through recycling separately for each part, obviously net of emissions from the transport and processing of packaging waste.

Emissions avoided in 2018, thanks to the sending of packaging waste for recycling by Consortium System, doubled compared to 2005 and have amounted to 40 million tonnes of CO<sub>2</sub>eq in 14 years. 39% of the greenhouse gas emissions avoided in 2018 was due to the recycling of glass packaging waste, followed by plastic and paper in that order.



## THE BENEFITS OF RECYCLING: SOCIO-ECONOMIC REPERCUSSIONS

The direct costs of the recovery chain amounted to 724 million euros in 2018 (twice as much as in 2005) and, overall, it is possible to estimate that from 2005 to 2018, the CONAI-Supply Chain Consortia system incurred total costs of 6 billion euros, including fees paid to municipalities, costs of disposal and collection from private premises, costs of recovery calculated based on the costs of sending for recycling, energy recovery and other forms of disposal and revenues from the sale of materials, as well as operating costs of the Consortium system.

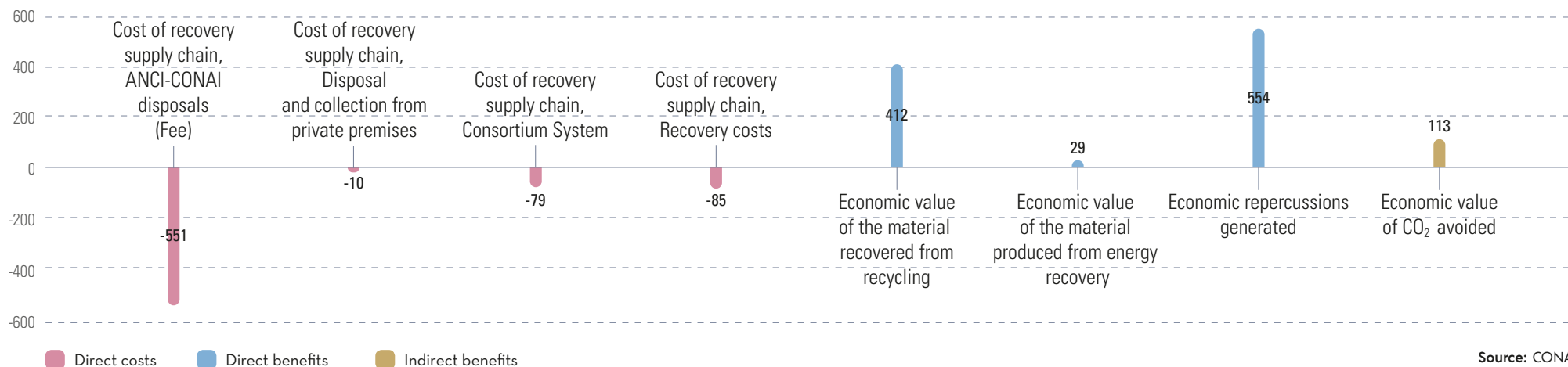
The economic benefits associated with the activities carried out within the scope of consortium management, even if they cannot be directly added together due to different accounting perimeters in certain cases, far outweigh these costs and reached almost one billion euros in 2018, twice as much as in 2005. Overall, it can be estimated that, between 2005 and 2018, the consortium supply chain for the recovery of packaging waste generated an economic value of almost 11 billion

euros. The direct benefits generated consist of three items:

- the economic value of the material recovered from recycling, which, at 412 million euros in 2018, represents 41% of the direct benefits generated by CONAI's activities.
- the economic value of the energy produced from energy recovery, equal to 3% of the direct benefits generated in 2018, amounting to 29 million euros.
- finally, the economic repercussions generated amounts to a share of 56% with 554 million euros, the value of which is calculated based on the number and average remuneration of people employed for collection and preparation for recycling of packaging waste.

The indirect benefits refer to avoided CO<sub>2</sub> and amounted to 113 million euros in 2018 (more than double the value of 2005): from 2005 to 2018 these benefits amounted to more than 1 billion euros in total.

### → Costs and economic benefits of consortium management in 2018 (million euros)



Source: CONAI



## COMMUNICATION AND AWARENESS-RAISING ACTIVITIES IN 2018

# FOCUS

CONAI's communication activities are planned to support the achievement of packaging waste recycling and recovery targets, disseminating the recycling culture and raising public awareness on the importance of quality separate collection, with the higher aim of promoting a circular economy.

### → "The voice of the leaders" CAMPAIGN

The new institutional press campaign "The voice of the leaders" sees the involvement of companies that join CONAI. With their "voice", the leaders of consortium member companies express the value and importance of the supply chain, in a scenario where risk concentration thresholds, sustainability, transparency and environmental protection are issues of great attention and interest. In fact, thanks to their membership of CONAI, companies protect the environment and contribute to a system that acts as the fulcrum of the circular economy, promoting its development.

### → Ipack-Ima Fair

CONAI and the Supply Chain Consortia took part in the Ipack-Ima Trade Fair, specialising in food and non-food processing and packaging, which took place from 29 May to 1 June in Milan. During the fair, insights were organised on the use of the CONAI Eco Tool (in conjunction with the prevention call) and on the Recycling Design platform, dedicated to the guidelines for the design of recyclable packaging.

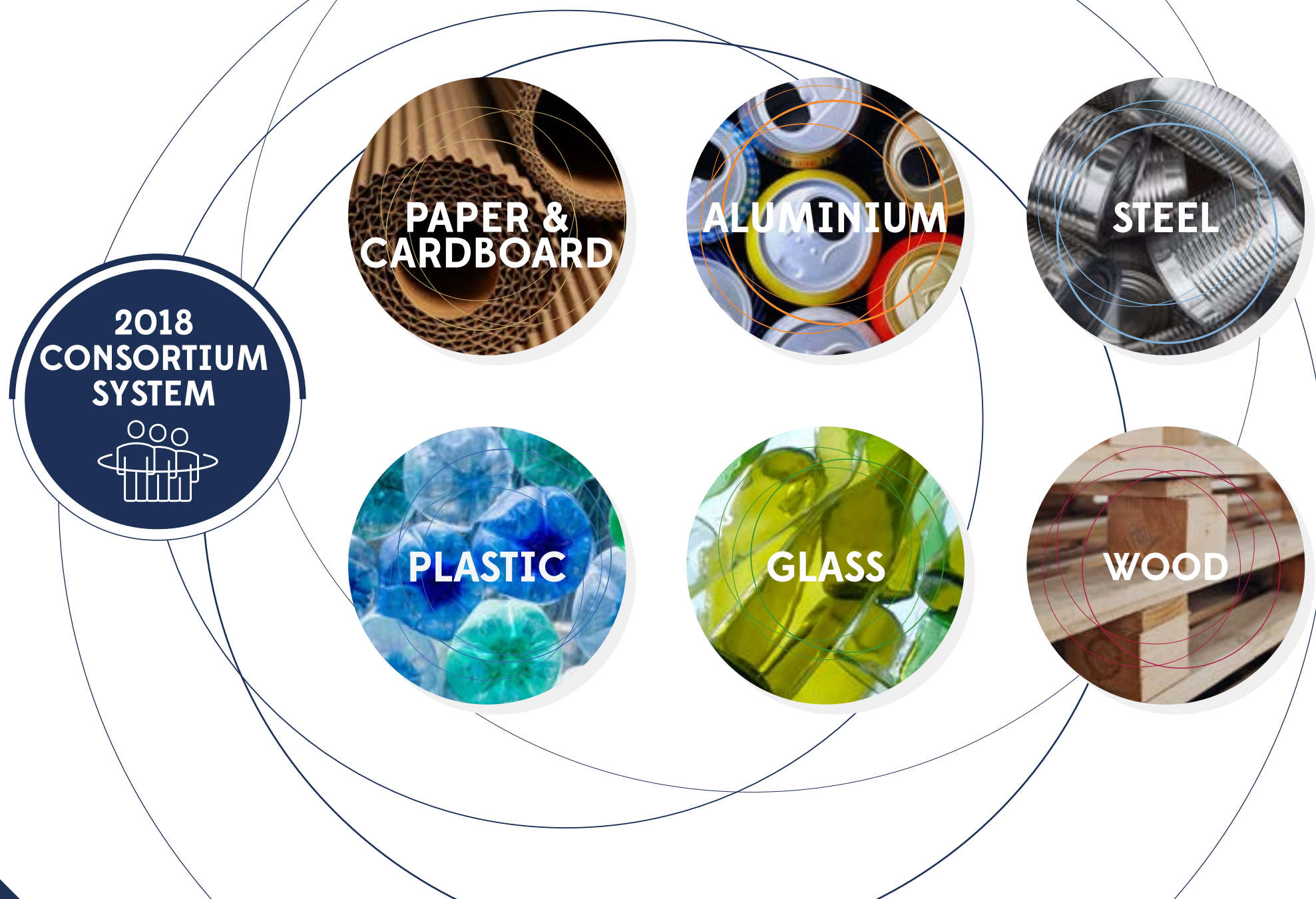
### → "Class Recycling" School Project

The "Class Recycling" School Project, addressed to primary schools throughout the country and implemented in collaboration with Corriere della Sera, reached its third edition. The project involved the distribution of 4,500 teaching kits and the presentation in two schools, in Bologna and Milan, of the video flipbooks implemented by Studio Bozzetto, which attended together with the mother bloggers of "Fattore Mamma" (Mother Factor). Almost 19,000 primary school pupils took part in the final competition, with 1,810 projects implemented with the recovery and reuse of packaging materials and two award events for the winning classes in San Sebastiano al Vesuvio (Naples) and Terracina (Latina).

In order to meet the requirements of Law 123/2017, CONAI has

### → #controglisprechi initiative

implemented a campaign aimed at educating consumers to consciously use the different types of plastic bags, instructing them on their environmental impact and the consequent need to reuse and recycle them. Seven distribution companies adhered to the #controglisprechi (against waste) initiative, with over 2,000 stores: Auchan Retail Italia, Bennet, Carrefour Italia, Esselunga, Italbrix, Leroy Merlin and Penny Market.



A close-up, high-angle photograph of numerous crumpled and crushed steel cans, creating a textured, metallic surface. The cans are arranged in a way that shows their ridged patterns and reflective surfaces. Overlaid on this image are several concentric blue circles and a diagonal blue band in the bottom right corner.

# STEEL

## Ricrea figures in 2018

Steel is a permanent, 100% recyclable material that is well suited to the concept of economic circularity that the European Union is aiming for. Moreover, it is the most recycled material in Europe (source: APEAL), which allows significant reductions in terms of CO<sub>2</sub> emissions, energy and raw material. Through its activities, RICREA contributes to increasing the value of steel packaging recycling thanks to the efforts of all players in the supply chain. In fact, also in 2018 we achieved an excellent recycling result of 78.6%.

Domenico Rinaldini, President of the RICREA Consortium

### → Framework Agreement Coverage

Municipalities served

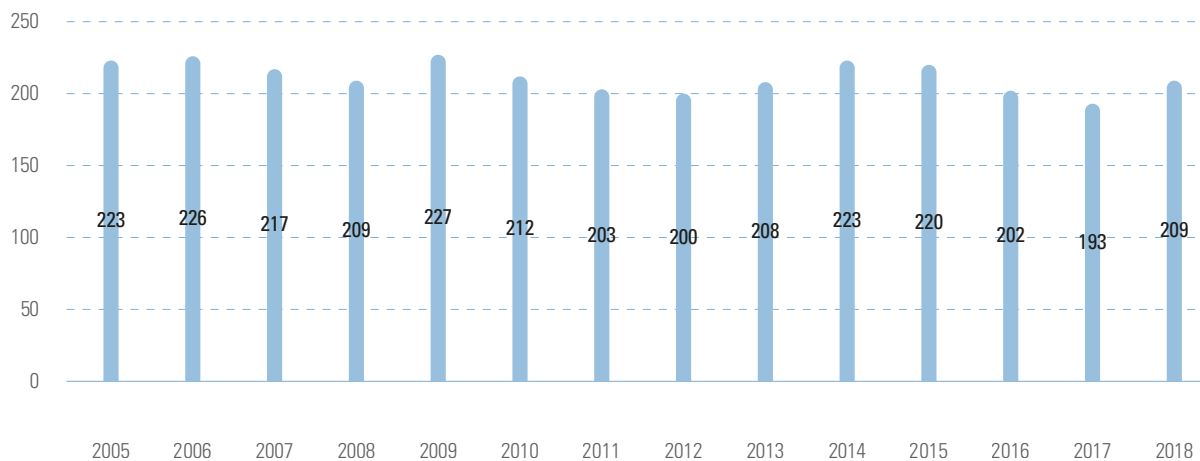
75%

Population covered

86%

### → Steel packaging sent for recycling by Ricrea from 2005 to 2018 (thousand tonnes)

In 2018, 19% of packaging sent for recycling came from the private sector (C&I), collected thanks to the 34 platforms distributed throughout the country



### → Steel packaging waste disposed of under the ANCI-CONAI agreement by macro geographic area (thousand tonnes and kg/inhabitant)



- Per capita disposal
- Disposal by volume



672 ETR 1000  
high-speed trains



**259**  
kt

Raw material saved

the average annual electrical consumption of primary energy  
of 362 thousand Italian households



**1.3**  
TWh

Primary energy saved thanks to recycling

emissions generated  
by 933 Rome-New York  
round-trip flights



**403**  
ktCO<sub>2</sub>eq

Emissions avoided thanks to recycling



**38**  
Mln €

Economic value of the material recovered thanks to recycling



**12**  
Mln €

Economic value of the CO<sub>2</sub> avoided thanks to recycling



# ALUMINIUM





# CiAl figures in 2018

For aluminium packaging, the concept of a green economy and safeguarding resources is an integral part of its characteristics and values, from that of recycling and energy saving to prevention, fully aware of the role of companies and the continuous improvements introduced by technological innovation that make ours one of the most environmentally friendly materials which is consistent with the new policies and models of socio-economic development of the Green Economy.

Carmine Bruno Rea, President of the CiAl Consortium

## Framework Agreement Coverage

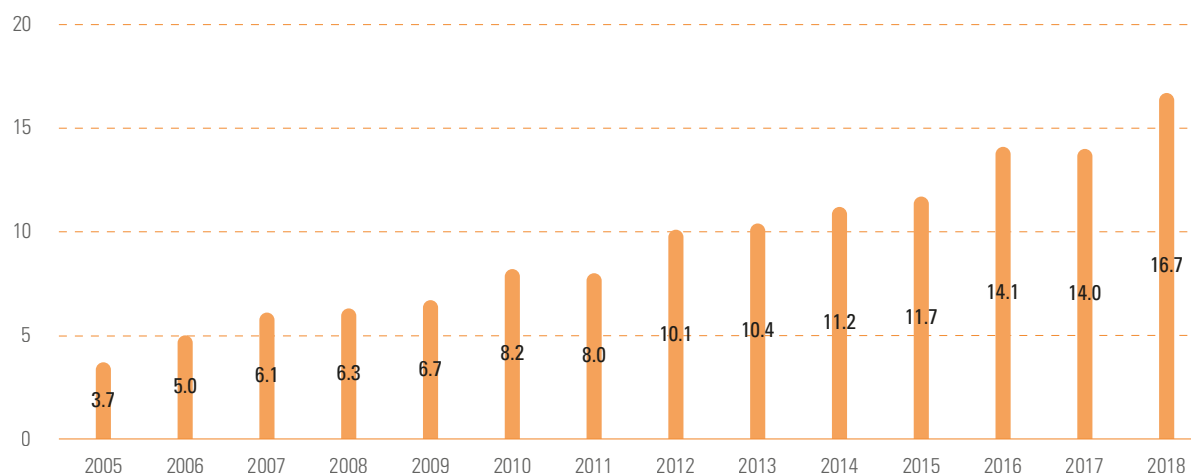
Municipalities served

65%

Population covered

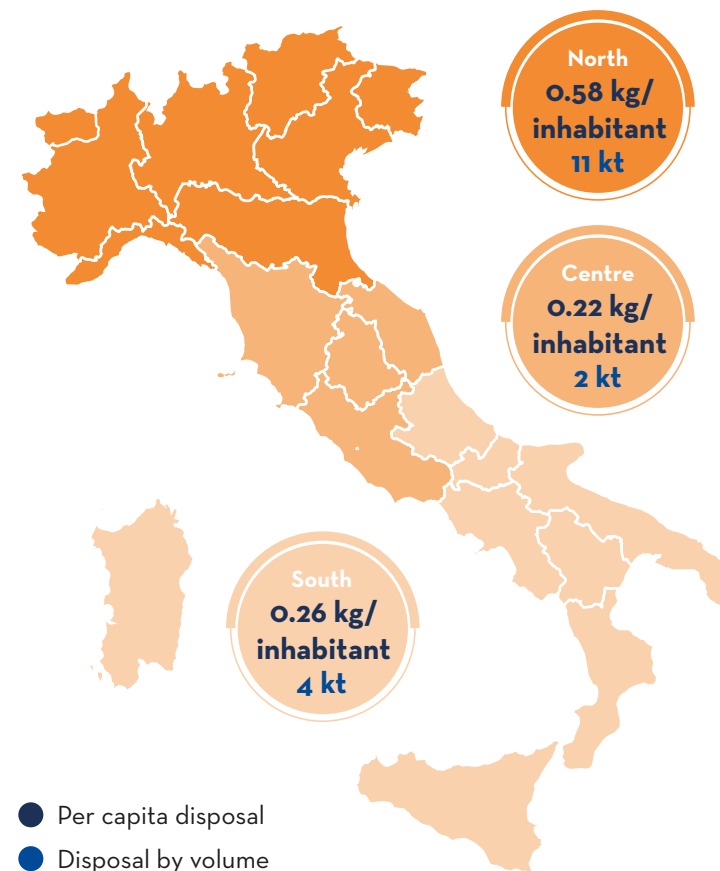
73%

## Aluminium packaging sent for recycling by Cial from 2005 to 2018 (kt)



Source: CONAI

## Aluminium packaging waste disposed of under the ANCI-CONAI agreement by macro geographic area (thousand tonnes and kg/inhabitant)



● Per capita disposal

● Disposal by volume



1.51 billion cans



16  
kt

Raw material saved

the average annual electrical consumption of primary energy  
of 104 thousand Italian households



0.39  
TWh

Primary energy saved thanks to recycling

emissions generated  
by 356 Rome-New York  
round-trip flights



154  
ktCO<sub>2</sub>eq

Emissions avoided thanks to recycling



7  
Mln €

Economic value of the material recovered thanks to recycling



5  
Mln €

Economic value of the CO<sub>2</sub> avoided thanks to recycling



# PAPER & CARDBOARD

# Comieco figures in 2018

In 2018, more than 81% of cellulose packaging was recycled. A result already beyond the EU 2025 target (75%) and in line with the 2030 target (85%). If we consider the saving of natural resources and CO<sub>2</sub> emissions avoided through recycling, the paper and cardboard industry is one of the pillars of the Italian circular economy and a strategic sector for national Green New Deal policies.

Amelio Cecchini, President of the COMIECO Consortium

## → Framework Agreement Coverage

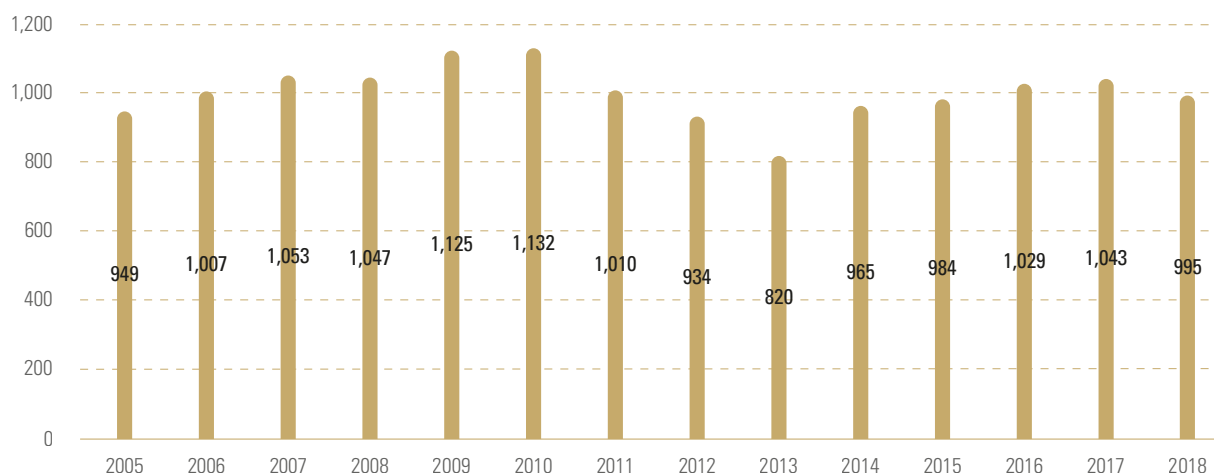
Municipalities served

68%

Population covered

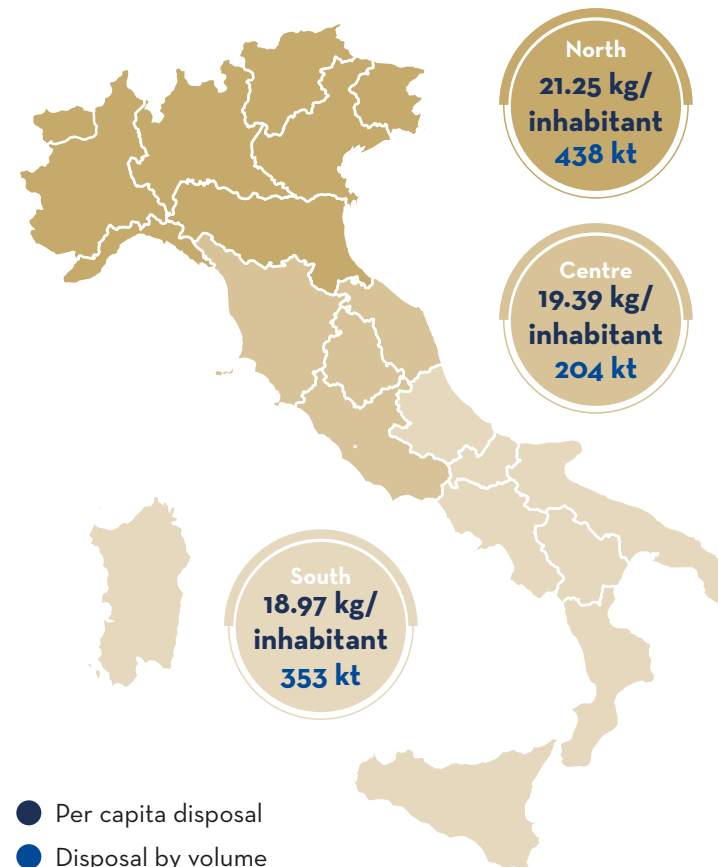
81%

## → Paper and cardboard packaging sent for recovery by Comieco from 2005 to 2018 (kt)



Source: CONAI

## → Paper and cardboard packaging waste disposed of under the ANCI-CONAI agreement by macro geographic area (thousand tonnes and kg/inhabitant)



- Per capita disposal
- Disposal by volume



332 million reams  
of A4 sheets



**829**  
kt

Raw material saved

the average annual electrical consumption of primary energy  
of 938 thousand Italian households



**3.5**  
TWh

Primary energy saved thanks to recycling

emissions generated  
by 2 thousand Rome-New York  
round-trip flights



**904**  
ktCO<sub>2</sub>eq

Emissions avoided thanks to recycling



**30**  
Mln €

Economic value of the material recovered thanks to recycling



**27**  
Mln €

Economic value of the CO<sub>2</sub> avoided thanks to recycling

The background of the slide is a photograph of stacked wooden planks in a warehouse or lumber yard. Overlaid on this image are three concentric circles in a dark red color. The word "WOOD" is centered within these circles in a large, white, sans-serif font. A solid dark red triangle is positioned in the bottom right corner of the slide.

# WOOD

# Rilegno figures in 2018

In 2018, 1,932,583 tonnes of wood were collected and sent for recycling, an increase in volumes of 7.74% compared to 2017. Recycled wood mainly becomes chipboard used by the domestic furniture industry and this allows wood to be sourced that otherwise would have to be bought abroad. Efficient recycling management creates a veritable circular economy that is important for Italy in both economic and environmental terms. Transforming a potential waste into an element capable of generating value is therefore not a utopia.

Nicola Semeraro, President of the RILEGNO Consortium

## Framework Agreement Coverage

Municipalities served

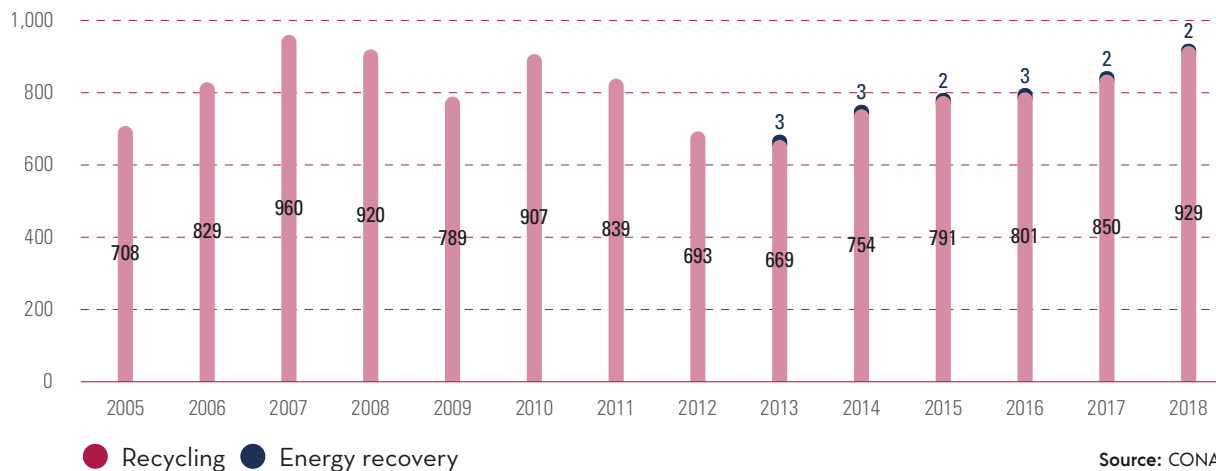
57%

Population covered

69%

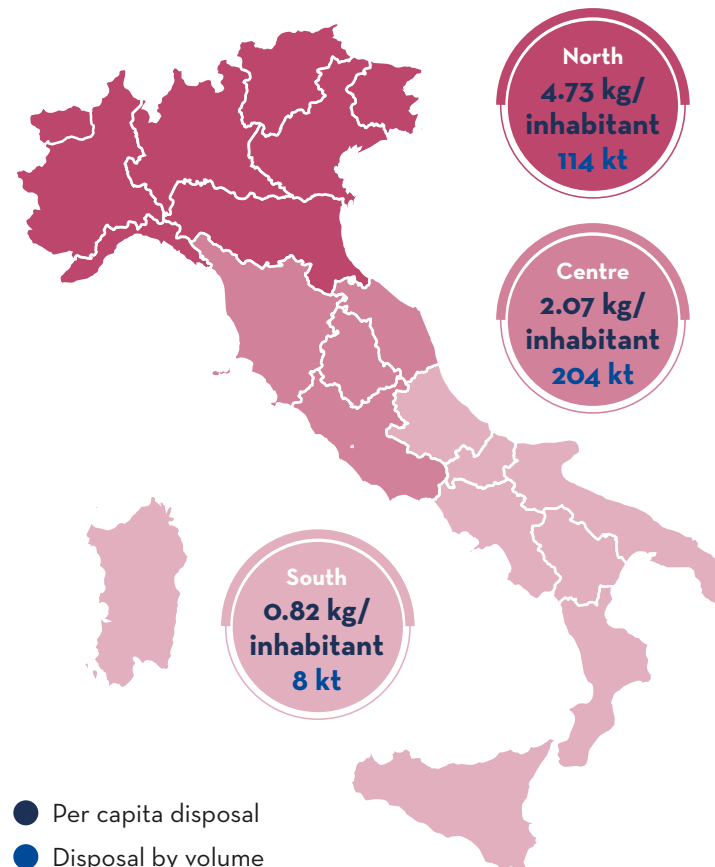
## Wood packaging sent for recovery by Rilegno from 2005 to 2018 (thousand tonnes)

In 2018, 84% of packaging sent for recycling came from the private sector (C&I), collected thanks to the 409 platforms distributed throughout the country (kt)



Source: CONAI

## Wood packaging waste disposed of under the ANCI-CONAI agreement by macro geographic area (thousand tonnes and kg/inhabitant)





42 million pallets



925  
kt

Raw material saved

the average annual electrical consumption of primary energy  
of 114 thousand Italian households



0.42  
TWh

Primary energy saved thanks to recycling

emissions generated  
by 134 Rome-New York  
round-trip flights



58  
ktCO<sub>2</sub>eq

Emissions avoided thanks to recycling



9  
Mln €

Economic value of the material recovered thanks to recycling



2  
Mln €

Economic value of the CO<sub>2</sub> avoided thanks to recycling

A background image showing a close-up of many plastic bottle caps in various shades of blue and green, some clear and some opaque. The caps are scattered and overlapping. Overlaid on this image are several concentric circles in a light blue color. A solid dark blue diagonal bar runs from the bottom right corner towards the center.

# PLASTIC



# Corepla figures in 2018

The results for 2018 once again demonstrate COREPLA's commitment to the economic, social and environmental sphere. In 2018, thanks to the collaboration with local authorities, collection exceeded one million two hundred thousand tons, with further significant growth in southern Italy and an increase in the national average per capita collection. The quantity of packaging sent for recycling also continued to grow, exceeding 640 thousand tonnes.

Antonello Ciotti, President of the COREPLA Consortium

## Framework Agreement Coverage

Municipalities served

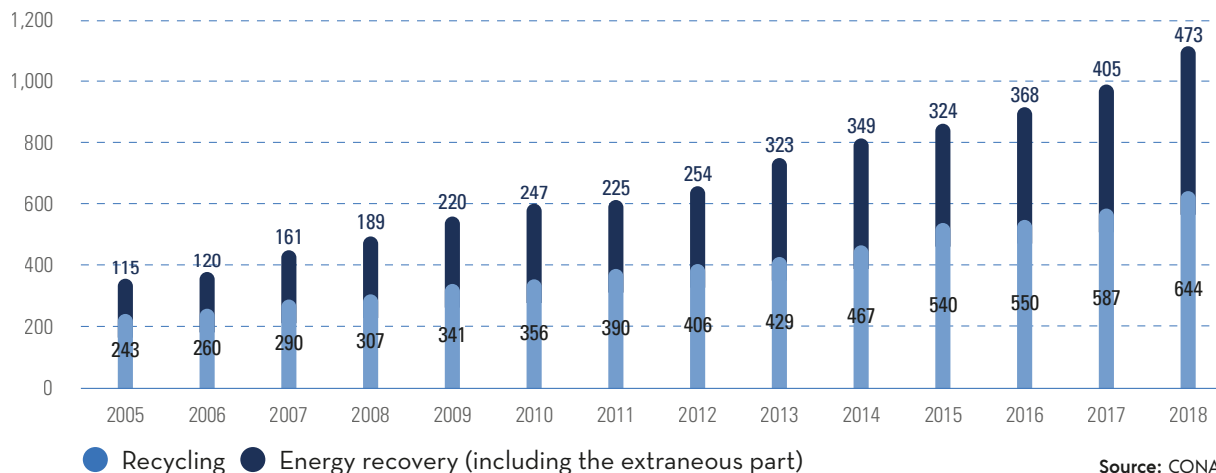
91%

Population covered

95%

## Plastic packaging sent for recovery by Corepla from 2005 to 2018 (thousand tonnes)

Of the almost 650 ktonnes, approx. 4% come from the commerce&industry circuit, collected through specific agreements with platforms throughout the country.



Source: CONAI

## Plastic packaging waste disposed of under the ANCI-CONAI agreement by macro geographic area (thousand tonnes and kg/inhabitant)





20 billion 1.5 litre PET bottles  
of water

**436**  
kt

Raw material saved

the average annual electrical consumption of primary energy  
of 2.4 million Italian households

**9**  
TWh

Primary energy saved thanks to recycling

emissions generated  
by 2 thousand Rome-New York  
round-trip flights

**916**  
ktCO<sub>2</sub>eq

Emissions avoided thanks to recycling

emissions generated by 493 Rome-New York round-trip flights

**213**  
ktCO<sub>2</sub>eq

CO<sub>2</sub> generation avoided due to energy recovery

**250**  
Mln €

Economic value of the material recovered thanks to recycling

**29**  
Mln €

Economic value of energy produced from recovery

**21**  
Mln €

Economic value of the CO<sub>2</sub> avoided thanks to recycling

A background image showing several broken and crushed green glass bottles on a light blue surface. A large, thin green circle is centered over the word 'GLASS'. A solid green triangle is in the bottom right corner.

# GLASS



## Coreve figures in 2018

Proper end-of-life management of glass packaging consumed in Italy, with separate collection and recycling in the production of new packaging, constitutes a model of sustainability that responds to the circular economy concept. CoReVe, by directly managing the recycling of that collected by 9 Italians out of 10, guarantees extraordinary economic and environmental benefits.

Gianni Scotti, President of the COREVE Consortium

### → Framework Agreement Coverage

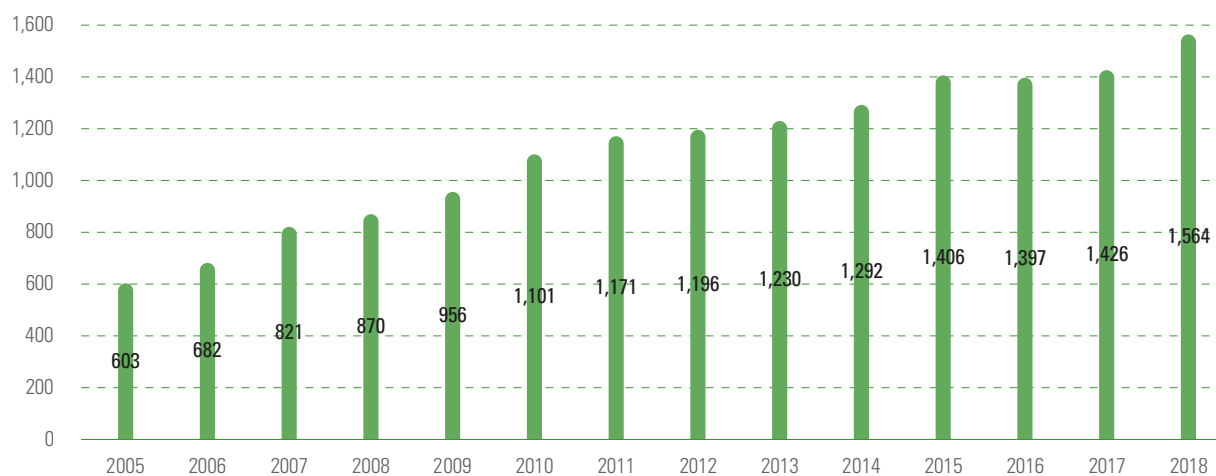
Municipalities served

91%

Population covered

96%

### → Glass packaging sent for recovery by Coreve from 2005 to 2018 (thousand tonnes)

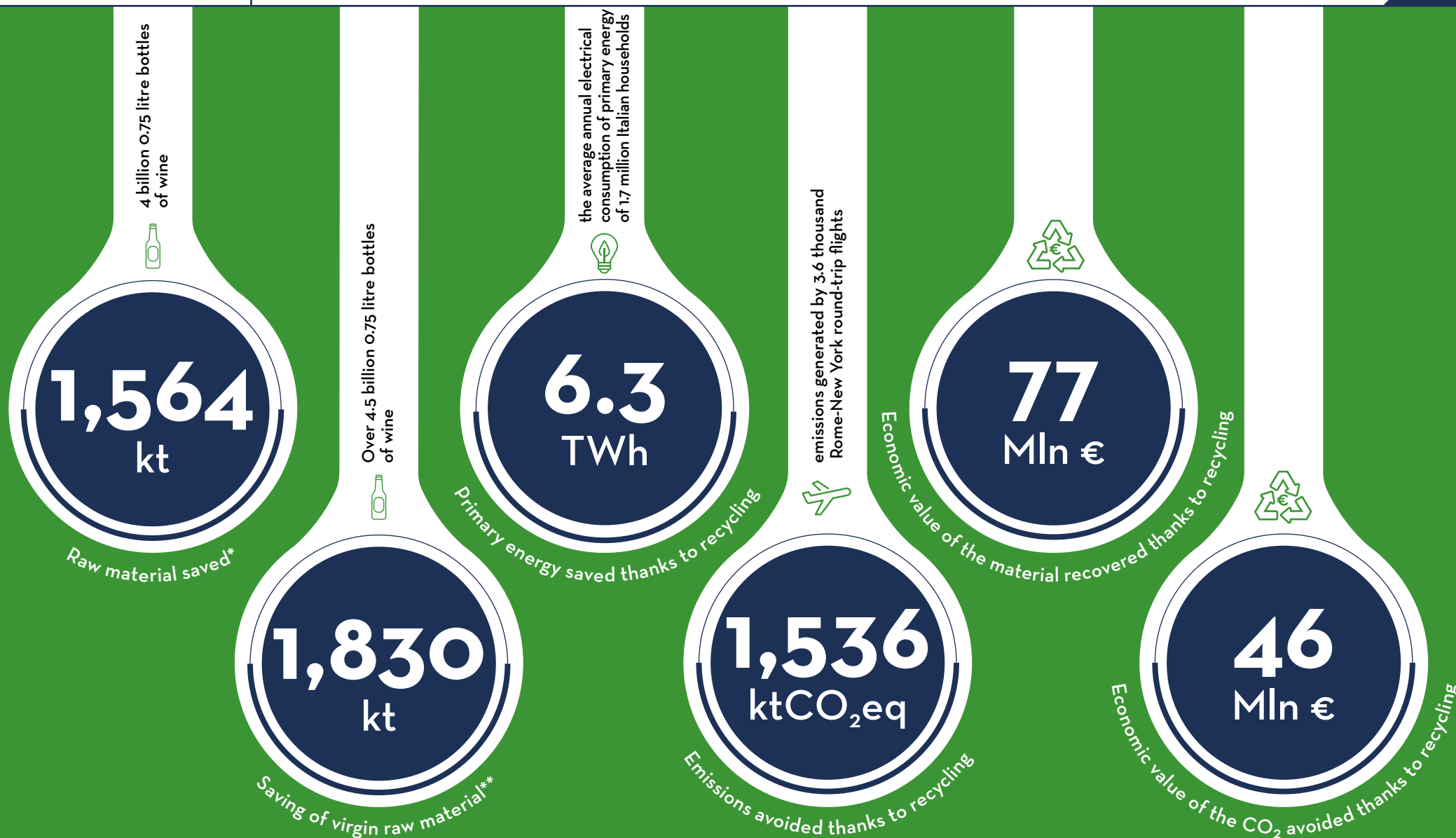


Source: CONAI

### → Glass packaging waste disposed of under the ANCI-CONAI agreement by macro geographic area (thousand tonnes)



- Per capita disposal
- Disposal by volume



→ **Environmental and socio-economic  
benefits of the Coreve Consortium  
management in 2018**

\*New glass not produced thanks to 2018 glass packaging recycling (ratio of 1 to 1 of replacement of recycled glass compared to new glass)

\*\*Virgin raw material saved thanks to 2018 glass packaging recycling (ratio of 1.17 to 1 of replacement of recycled raw material compared to recycled glass)



PREVENTION

A top-down photograph of various items on a white surface, including a metal can, a glass bottle, a ruler, a protractor, a pencil, a pen, a sharpener, a piece of paper, and crumpled plastic and paper waste. A large, faint blue circle is overlaid on the image, and the word 'PREVENTION' is written in large white capital letters across the center. A dark blue diagonal shape is in the bottom right corner.



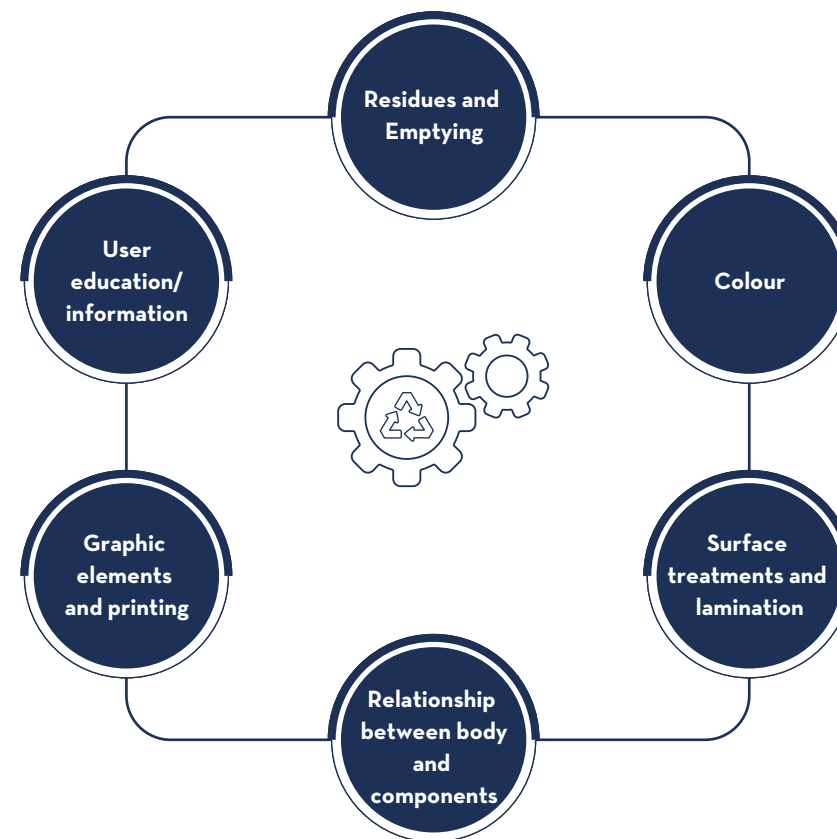
Among the objectives provided for by current legislation, in addition to recycling and recovery of packaging waste, CONAI must engage in "prevention" by promoting actions aimed at increasing the recyclability and reusability of packaging, as well as its reduction. CONAI meets this commitment through the implementation of various initiatives addressed to member companies.

## DESIGN FOR RECYCLING - DESIGN FOR RECYCLING GL

Design for Recycling is the web platform ([www.progettarericiclo.com](http://www.progettarericiclo.com)) on which the "Guidelines to facilitate the recycling of packaging", implemented by CONAI with the support of supply chain consortia and leading Italian design universities, can be consulted publicly. The purpose of these documents is to provide effective design guidelines in order to increase packaging recyclability, establishing a continuous dialogue on the issues of recycling and design for recycling with the various players in the supply chain. Through the platform, it is in fact possible to leave suggestions, with a view to the continuous updating and improvement of the Guidelines.

The guidelines currently available concern the design of plastic and aluminium packaging, while the design for recycling guidelines for paper and cardboard packaging will be available during 2020.

### → Aspects to be considered in design





## PREVENTION DOSSIER

Since 2001, every three years, CONAI has been taking stock of the eco-design and sustainability of packaging through the Prevention Dossier. From 2001 to 2013, the Dossier promoted and narrated the eco-design interventions made by companies on their packaging in order to disseminate these good practices. Since 2016, the Dossier has been transformed into the more popularising “Futuro Comune - Innovazione, bellezza e sostenibilità” (Common Future - Innovation, beauty and sustainability) product, written in collaboration with RCS.

The 2019 edition entitled “Pensare Circolare” (Circular Thinking) will present the roadmap for the environmental sustainability of packaging, starting from research carried out by the University of Rome 3 that takes stock of the approach that companies are adopting on this issue, placing the value of packaging back at the heart of the debate and how to increase it through innovation for sustainability.

The story of almost 20 years of good practices in 7 editions.

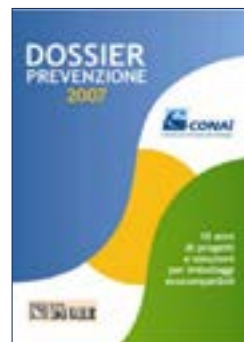
More than **500 case studies of ecosustainable packaging** narrated by CONAI and by **more than 280 innovative companies** from 1999 to date.



2001



2004



2007



2010

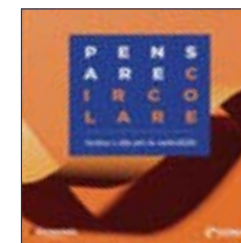


2013



New publishing  
product

2016



New dossier

2019



## CONAI PREVENTION CALL

“The CONAI Prevention Call – Promoting the environmental sustainability of packaging”, with the patronage of the Ministry of the Environment, is an initiative which, since the 2014 edition, annually makes an award to the most innovative and eco-sustainable packaging solutions made by companies. The Call is open to all member companies that have revised their packaging with a view to innovation and environmental sustainability, acting on at least one of the following levers: reuse, facilitation of recycling activities, raw materials saving, use of materials from recycling, logistics optimisation, packaging system simplification and production process optimisation. Innovations are evaluated by comparing the environmental impacts generated by packaging before and

after the intervention through the CONAI Eco Tool, the online tool which, through a simplified LCA analysis, calculates the environmental benefits of preventive actions implemented on packaging, in terms of reduction of CO2 emissions, energy and water consumption.

The Call has been a successful initiative which, over the years, has seen a significant growth both in terms of the number of participating companies and in terms of the number of good practices collected and disseminated (from 36 cases awarded in the 2014 edition to 103 in the 2018 edition), and for this reason has seen a steady increase in the total prize money for the initiative: from 200,000 euros in 2014 to 500,000 euros in the 2019 edition.

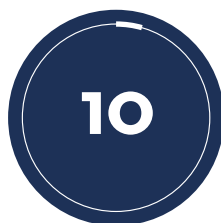
### → Case studies that participated in the 2018 Prevention Call



Re-use



Saving  
of raw material



Use of recycled /  
recovered material



Facilitation  
of recycling  
activities



Logistics  
optimisation



Simplification of the  
packaging system



Optimisation  
of production  
processes



## PREVENTION STUDY

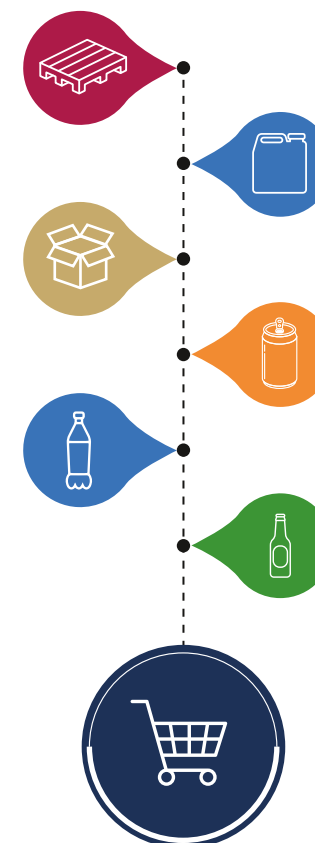
# FOCUS

Based on the data and information collected through the last three editions of the "CONAI Prevention Call", an analysis was carried out to estimate the potential environmental benefits linked to the dissemination of best practices, implemented by packaging producers and users in Italy, in terms of savings in raw materials, water and energy resources and CO<sub>2</sub> emissions avoided.

### → The sample

For the analysis, 120 case studies of packaging systems were selected, including both primary and secondary/tertiary packaging, on which approx. 150 eco-design interventions were carried out. The case studies were selected as representative of a "typical basket" of products usually present in the shopping cart of Italians, with the aim of assessing the environmental effects generated by the eco-design actions undertaken on the related packaging. The sample is representative of all packaging materials.

Most of the time, prevention measures concerned primary packaging, such as bottles, detergent bottles, biscuit bags and cosmetic cases, but also caps and closures and labels; in other cases, eco-design measures concerned the entire packaging system, for example by working on optimising logistics, with repercussions also on secondary and tertiary packaging used to transport and handle goods (e.g. pallets, boxes, displays and palletisation film).





## PREVENTION STUDY

# FOCUS

### → The actions investigated

The effect of the preventive actions promoted by producers and users on the selected sample was assessed in terms of:

#### SAVING OF RAW MATERIAL USED IN THE PRODUCTION OF PACKAGING

through

- ▶ weight reduction interventions
- ▶ use of recycled material
- ▶ re-use
- ▶ optimisations resulting from more efficient logistics

#### REDUCTION OF ENVIRONMENTAL IMPACTS

assessed using the CONAI Eco Tool based on a simplified LCA analysis, in terms of:



energy saving



water saving



reduction of CO<sub>2</sub> emissions



→ Environmental benefits  
of prevention  
activities  
estimated by the study



## THE RESULTS

As a basic hypothesis of the analysis, in order to estimate the resulting environmental benefits, it was assumed that all the packaging of products belonging to the standard basket identified and put on the market in Italy has been subjected to eco-design interventions similar to those of the case studies mapped through the "CONAI Prevention Call".

To this end, the number of items sold was estimated for each type of packaging in the basket, based on the analysis of the packaging put on the market by material and by product category for the year 2017.

## CONAI 2018 GREEN ECONOMY REPORT

Curated by the CONAI Consortium

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SOSTENIBILE

Sustainable Development Foundation

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The CONAI 2018 Green Economy Report CONAI can be downloaded from the "Green Economy" section of the website **[www.conai.org](http://www.conai.org)**



The Green Economy Report® is the tool chosen by the Conai Consortium in order to report on and communicate its performance in terms of sustainability and commitment to the environment. The document, drafted in compliance with the main international standards, has been developed following the original assessment and reporting methodology developed by the Foundation for Sustainable Development in order to respond to the needs of organisations engaged in the green economy.