CONAI
CONSORZIO NAZIONALE IMBALLAGGI

For the development of separate waste collection in Central and Southern Italy

CONAI'S CONTRIBUTION, RESULTS AND THE PLANTS TO BE BUILT

April 2021

*The challenges faced by the **Central and Southern regions of Italy** have always been a hindrance to the development of qualitative and quantitative standards of separate waste collection—in terms of effectiveness and efficiency— comparable to those of many Northern areas. Nevertheless, there are many municipalities that have achieved results comparable (and sometimes better) to Northern ones.*

*CONAI's support to these regions has been constant; it has increased in recent years, when many municipalities **formed associations to plan for separate waste collection services,** establishing EDAs (Management Area authorities) or ATOs (Optimal Management Areas).*

*As described herein, the CONAI consortium system with the assistance of ANCI has always supported municipalities that request assistance in preparing **Urban Waste Management Plans**. The **planning** include **technical** and **economic feasibility studies,** which are the product of thorough and complex analysis. With this initiative, the consortium makes economic resources and **know-how** available to local contexts. This legacy, when **met** with a clear political will, can achieve **extraordinary results** even in a short time.*

*In addition to describing this process, the document illustrates the **local projects** that CONAI has been running since 2003 in the southern and central regions of Italy, which primarily focus on the **planning of separate waste collection, start-up** and **communication services**, **follow-up** and **reporting,** and the introduction of the **PAYT scheme** (Pay-as-you-throw).*

*In 2020 alone, the range of interventions involved more than **8,300,000 residents** across **five Regions (Basilicata, Calabria, Campania, Puglia and Sicily),** with the development of projects that can dramatically improve the quality of the separate waste collection system, which in many cases **exceeded 65%.***

*The most recent examples are the City of **Cosenza,** which went from a separate waste collection rate of 22% in 2013 to **61%** in 2019; **Catanzaro,** which went from about 10% in 2015 to **67%** in 2019; **Salerno,** which was stalling at 10% in 2008, but now exceeds **65%; Benevento,** which increased from 32% in 2010 to **63%** in 2019; and **Potenza,** which from 20% in 2015 reached **65%** in 2019. Further examples are the tourist town of **Villapiana** (CS), which from 4% in 2016 jumped to **65%** in 2019, and the municipality of **Ottaviano** (NA), which went from 40% in 2011 to **83%** in 2019.*

To really ***complete*** *the* ***cycle,*** *however, it is increasingly necessary for* ***separately collected waste*** *to be* ***transformed into new materials.*** *This process should occur as close as possible to where end-of-life waste is collected to reduce the environmental and economic impact of its transport.*
Unfortunately, ***Southern Italy suffers*** *from a* ***dramatic shortage*** *of* ***waste sorting*** *and* ***treatment*** *facilities, which thwarts expectations of any significant improvements in Italy's recycling performance in the near future.*

For the first time, CONAI ***has completed*** *an assessment, based on experience, of* ***system plant requirements*** *at a national level so as to autonomise Central and Southern regions.*
As explained in the final part of the document, the country would require more than ***160 new facilities****. This* ***investment*** *is estimated to exceed* ***two billion euros,*** *and it would also* ***have a significant impact*** *on* ***employment:*** *the new plants would require the hiring of more than* ***2,300 direct employees,*** *not counting ancillary activities.*

This estimate *is based on the separate waste collection targets that the European Union has imposed on member states by 2030, for which CONAI is the guarantor for Italy, and takes into account national trends of waste production. Being able to* ***monitor*** *this trend with precision and in the long term is one of the strengths of the partnership of CONAI and the supply chain consortia with ANCI and municipalities.*

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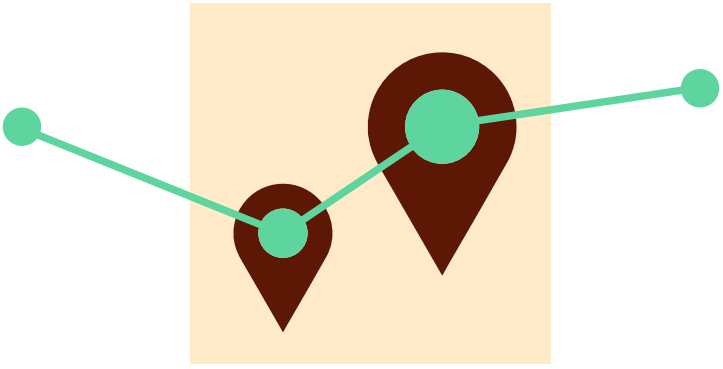


INTRODUCTION

2020-2021

WHAT WE ARE DOING AND WHAT WE HAVE DONE

In 2020 CONAI continued to pay **special attention** to those areas where **separate packaging waste collection falls short** of qualitative and quantitative standards as per current regulations.

Central and Southern regions are characterised by a large number of small towns and face numerous critical issues, such as **the lack of facilities** in some sectors. These local complexities in some ways **hinder progress toward a more effective and efficient management**. Nevertheless, **more and more positive examples** are being recorded at the local level. A significant new aspect to highlight is a paradigm shift in the approach to management. Pursuant to Regional Laws 14/2016 and 14/2014 of **Campania** and **Calabria,** respectively, and with the support of CONAI, the municipalities—thanks to **ATOs** and/or **EDAs** activities—**have joined forces to intensively plan Separate Waste Collection services.**

This process will presumably **lead to the overall streamlining of the whole integrated waste management cycle,** provided that the **required plants can be built.** These plants are becoming increasingly strategic for the country to meet the EU 2030 objectives. This process has led to the identification of a **shared path** between all entities involved and over the next few months it will become a reference model for other contexts, with the aim of overcoming management fragmentation between Municipalities.

SHARED TECHNICAL and ECONOMIC FEASIBILITY PROCESS

The **preparation** of a Municipal Waste Management Plan is the result of **extensive planning** that must be carried out in sequential phases, as described in detail below.

The reference model in this specific case is based on the activities carried out with the **EDA of Caserta,** which includes **104 municipalities** and almost **1 million residents**.

The same activity is being carried out with the following entities.

Southern Italy
EDAS — MANAGEMENT AREA AUTHORITIES

6,506,808

RESIDENTS AFFECTED BY CONAI INTERVENTIONS

868

MUNICIPALITIES AFFECTED BY CONAI INTERVENTIONS

EDA of **CASERTA** — 924,000 — 104

Optimal Management Area of **NAPOLI 1** — 1,297,808 — 9

Optimal Management Area of **NAPOLI 2** — 711,000 — 24

EDA of **BENEVENTO** — 278,000 — 79

EDA of **AVELLINO** — 415,000 — 114

EDA of **SALERNO** — 1,108,000 — 161

EDA of **COSENZA** — 709,000 — 150

EDA of **VIBO VALENTIA** — 158,000 — 50

EDA of **CATANZARO** — 358,000 — 80

EDA of **REGGIO CALABRIA** — 548,000 — 97

Calculations based on CONAI data, 2019

However, the model can be applied to any local context of a specific size that intends to plan services by joining forces and through an integrated industrial approach, taking into account the following variables:

VARIABLES

COLLECTION

It can be
door to door, kerbside, or mixed.

COMMINGLING OF PRODUCT FRACTIONS

Paper and cardboard only

Glass only

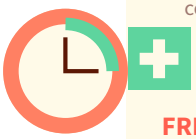
Commingled light waste (plastic and metals)

Biodegradable packaging (wet fraction)

Glass – metals

TYPE OF EQUIPMENT

Bags, **tubs,** or **wheelie bins** for door-to-door collection. For kerbside collection, **bell-shaped containers** or **bins,** or both types according to the collection system.



FREQUENCY

From **daily** to **weekly** or **fortnightly** depending on the type of waste, quantity, and user.

BIN COLOURS

Recommendations for standardisation

PAPER
Blue

METAL
Turquoise

GLASS
Green

UNSORTED
Grey

PLASTIC
Yellow

ORGANIC WASTE
Brown

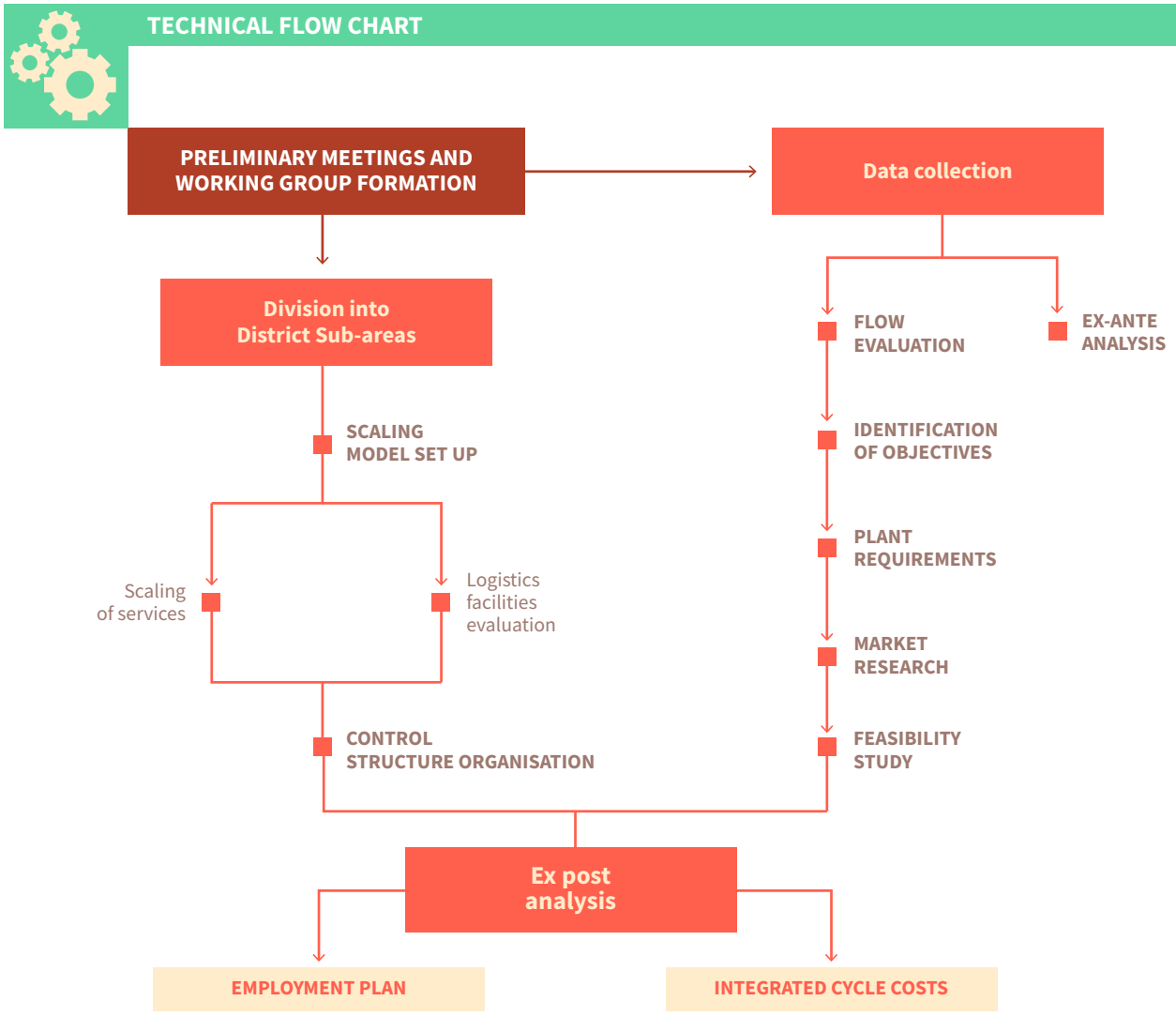
PROCESS PHASES

1
Data collection

This is carried out by the local EDA, which alongside the Municipal Office coordinates the activities regulated by the relevant Regional Law based on formats developed by CONAI. To define the databases to be used in the plan, different sources are employed to ensure the data is as reliable as possible. Data on waste production come from the regional database website, in this case "ORSO" [Osservatorio Rifiuti Sovraregionale – supraregional waste monitoring body]. Data include, among others: Domestic and non-domestic users, categorised by ATECO code; data on "existing operations", i.e. current contractors and operators; operations and administrative staff; local infrastructures such as collection centres, reuse centres, local composting stations; service management costs, and waste treatment/disposal costs.

2
Identification of Sub-Areas

This is carried out by the local EDA, after consultation with the municipalities, in accordance with the advisory opinion set out in the Resolution of the Assembly of Mayors of 11 October 2019, and final approval set out in the Resolution of the Management Area Council no. 16 of 20 November 2019, in full compliance with the indications of the Regional Law.



3
Ex-ante analysis

Data analysis provides an overall view of the ex-ante context, showing current significant information, in particular: number of residents, domestic and non-domestic users, employed staff, and current cost of services.

4
Analysis of waste flows and identification of Separate Waste Collection targets

Waste production data from the last three years (in this case 2017, 2018, and 2019; source: ORSO database, Campania Waste Monitoring Body) is analysed to identify monthly and annual trends of waste production. The analysis determines the process starting point, different for each Sub-Area (SAD) and Municipality, so that the whole region can achieve the goal of 70% of separate waste collection. It's also used to adjust collection services, such as for the summer peaks for the towns on the Domitian coast and other local specificities, which at certain times of the year show trend differences, especially in production. In this case, this has led to planning a collection schedule and additional services in the summer period.

5
Hypothetical service management options

A unified management of services is envisaged in each Sub-Area. Each Sub-Area should include a Service Centre that houses the fleet of vehicles used to carry out the services across the entire Sub-District and where all operators are based. In addition, the Service Centre will handle all support activities

such as vehicle maintenance, refuelling, and storage of supplies, and all transport of waste to treatment plants will depart from here. This includes both the waste collected by collection teams and from municipal collection centres. As regards collection services, 4 different collection models have been posited. These include one standard model, and 3 variations based on the different types of municipalities identified: Low-density rural/mountain municipalities; municipalities with a prevalence of apartment buildings (vertical housing with or without communal internal spaces), and tourist towns with variable occupancy in second homes or continuous occupancy only on weekends. Essentially, door-to-door collection is provided in any case but with different frequencies depending on the case, and specific variations for non-domestic users.

6
Service scaling assumptions

Collection services were dimensioned by municipality based on the number of equivalent domestic and non-domestic users, estimated waste production, and collection methods. The scale of the transport for waste collected from individual municipalities is arranged centrally in each Sub-Area to optimise staff and vehicle resources, ensuring that vehicles always travel fully loaded. The scale of street sweeping services in each municipality is based on the number of available operators: the number of sweepers to be employed is determined by subtracting the number of collection and transport operators from the total number of staff in each municipality.

7
Plant requirements

The scale of the plants required for the treatment of the various matrices was calculated based on flow analysis, service planning, and achievement of the separate waste collection targets, as well as taking into account the waste produced through separate collection. This determines the number and capacity of the plants.

8
Fact-finding survey

This activity is carried out exclusively by the EDA and is aimed at identifying the technologies and investments on the market, with related operating costs.

9
Plant systems feasibility study

A feasibility study of the plant systems was conducted on the basis of the data provided by the EDA, and according to incoming quantities. Then, mass balances for each plant were calculated and the waste treatment fees (euro/tonne) were determined.

10
Identification of logistics and control structures

In each Sub-area is located one Service Centre of varying size depending on the number of residents in the Sub-area. The service centre houses the vehicles, the equipment for waste transport (e.g. semi-trailer dump trucks or garbage compactors), administrative offices, and changing rooms. The location of these Service Centres and of the control structure remains to be defined by the EDA. In addition, Municipal Collection Centres are planned in locations where they're not already present, as well as Reuse Centres in municipalities with more than 25,000 residents. The size, minimum staffing and equipment requirements, and related investments and operating costs have been identified for these facilities.

11
Ex-post analysis

Based on Plan assumptions, ex-post analysis showed municipal collection centres, reuse centres and service centres to be built, the annual cost of facilities and staff, the annual total cost of services, and the change compared to the current cost and conditions.

12
Integrated cycle cost estimate

Finally, an estimate of the costs of the integrated cycle is provided, i.e. the sum of service costs, Municipal (logistics and control structure) costs, and waste treatment and disposal costs.

13
Employment plan

Based on the scaling of services, plant requirements, and estimation of the number of staff required for the management of the control centre, the Employment Plan is compiled by category and by role according to national employment contract terms and conditions.

BUSINESS PLAN

The following is the **Business Plan** required to support the planned **Integrated Cycle** as described above from an economic and financial point of view. As the current cost of municipal waste management will eventually be compared with the cost of the planned integrated cycle, the current cost is first estimated.

The **ex-ante cost** is estimated as the sum of two components:

- **The cost of services,** given by the sum of the costs stipulated or in any case incurred by the Municipalities, and reported by the Administrations as part of the data collection carried out by the EDA in the initial phase of the project;
- **The cost of treatment,** estimated using 2019 waste production data and current average market rates.

To estimate the **future or ex-post costs** of the new urban sanitation service we proceeded as follows:

1. the **Cost of operations staff** for individual services was estimated on the basis of hourly requirements;
2. the **Cost of vehicles and electromechanical equipment** was estimated on the basis of hourly requirements, and it includes all the costs generated by these goods: asset depreciation in seven years, fuel at the pump, spare parts, tyres, consumables, and administrative costs (stamp duty and insurance), excluding maintenance;
3. the **Cost of containers** (tubs, wheelie bins) was estimated on the basis of quantity requirements, and it includes asset depreciation cost in five years, and a minimum % of replacements;
4. the **Cost of the bags** was estimated on the basis of quantity requirements, and it includes the value of the annual supply.

Other **industrial costs** include an estimation of:

- the costs of **communication activities** (commensurate to the number of residents – €/contact);

- **electronic service monitoring** costs;
- asset depreciation costs for the **CCR (Municipal Collection Centres),** the Service Centres, the local composting stations, and **CIRO (Reuse Centres)** over 15 years;
- the costs of operating such facilities, including management of the service centres' internal **mechanical workshop;**
- The cost of coordination and non-operation staff of the Sub-Areas, including maintenance staff.

The **above costs** were added to the **General Expenses and the operating margin** (or business profit), valued at a flat rate of 5%, + 5% of industrial costs. Finally, security costs were added.

The cost of waste **Treatment** was estimated as follows:

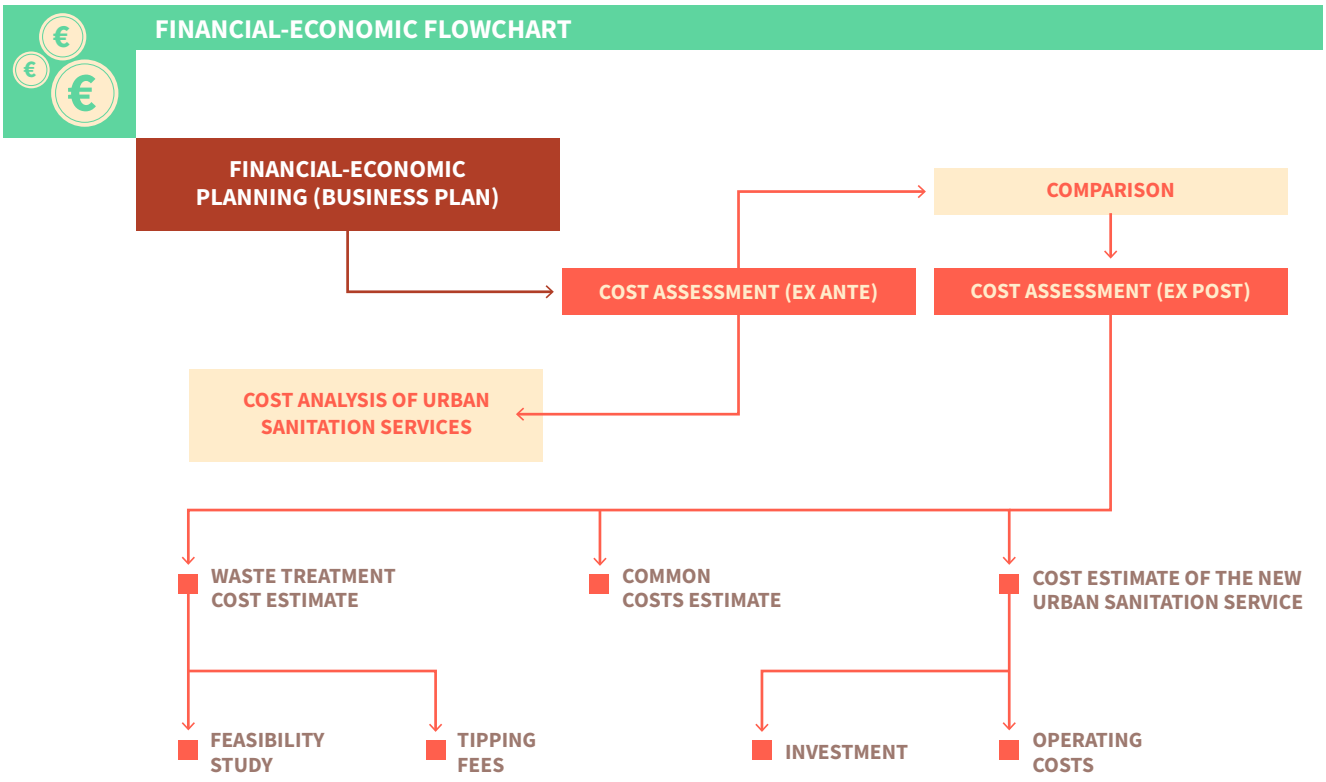
1 analysis of the results of the fact-finding survey carried out by EDA Caserta;

2 assessment of the investment and operating costs of individual plants;

3 assessment of proceeds from the transfer of materials;

4 to derive the **tipping fee** (which is the same for all municipalities) from the estimated plant **operating costs,** the total user cost of capital and running costs was adjusted on the basis of the quantities collected, and then distributed among the municipalities based on the estimated quantities of the various waste fractions collected at full operational capacity;

5 the **operating costs** (services + waste treatment) were added to the municipal costs (distributing them according to the number of residents), which are given by two components: the costs of the central administrative structure (in the case of a sole provider) and the costs of landfill post-closure care and ecobale storage sites (specific to Campania).



LOCAL PROJECTS IN THE SOUTHERN AND CENTRAL REGIONS

CONAI's support activities for municipalities mainly focus on:

|1 Planning of Separate Waste Collection services
|2 Start-up and Communication
|3 Follow up
|4 PAYT (Pay-as-you-throw)

CALABRIA

After sharing the technical content and objectives regarding intervention priorities to support municipalities trailing behind in terms of separate collection of packaging waste, a Memorandum of Understanding was signed with the Calabria Region in November 2020, which set out the procedures to support municipalities with a percentage of separate collection less than or equal to 25% and a minimum population of 10,000.

The technical support included the organisation of education/information meetings for municipalities, support for the preparation of projects to develop the separate collection of waste and packaging waste, the implementation of information campaigns aimed at residents, the mapping of the entire public and private regional plant system for the management of packaging waste, and the implementation of a waste traceability system. The support projects to the ATOs according to the provisions of LR 14/2014 are illustrated below.

- **ATO of Catanzaro (Optimal Management Area: 80 municipalities - 362,000 residents)**

  Support activities for the preparation of the Technical & Business Area Plan, which involved all the municipalities of the province, concluded in 2020. The Plan and the resolution were published in December 2020 on the city of Catanzaro's public noticeboard, the lead municipality of the ATO, and in early 2021 the ATO itself will publish the tender for the sole provider;

- **ATO of Vibo Valentia (Optimal Management Area: 50 municipalities - 160,000 residents)**

  Support activities to the Municipal Office of the ATO were delayed in the first phase due to the Municipalities' failure to provide management data. In the second half of 2020 the Feasibility Study was presented, while the Technical & Business plan for the whole Area is being finalized;

- **ATO 5 Città Metropolitana (Optimal Management Area: 97 municipalities - 553,861 residents)**

  With the Metropolitan City, too, before presenting feasibility scenarios for the ATO and for individual AROs [Optimal Collection Areas], the whole territory was mapped out including all the relevant information for associated planning. The activity, still in progress, will terminate by mid-2021;

- **ATO Cosenza (Optimal Management Area: 155 municipalities - 711,739 residents)**

  From the start of the support activities to the Municipal ATO office, there have been delays in the retrieval of information and data from a significant number of Municipalities. This slowed down both the process of preparation of the Feasibility Plan first, and the detailed planning with all the technical, economic and financial elements. Despite this, we managed to draft the various feasibility scenarios, thereby creating the necessary conditions for the second step—the preparation of the technical-economic-financial report of each individual ARO. These activities, for the reasons described above, are expected to be completed by mid-2021.

Municipality of Cosenza (69,484 residents)

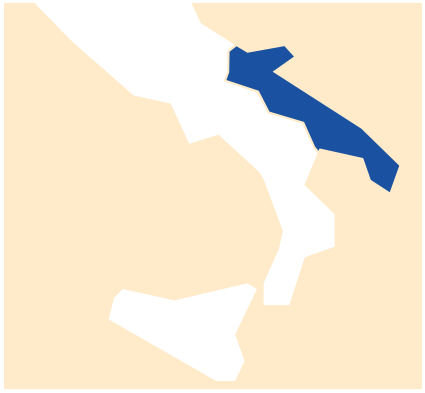
Following the signing of the Memorandum of Understanding on 3 June 2014, which was subsequently extended at the request of the municipal administration, municipality support included activities of *start-up*, communication, and public awareness of the new methods for separating waste and packaging waste. Throughout 2019, support activities focused on the monitoring phase, with targeted *follow-up* and *customer satisfaction* initiatives. Initiatives were also carried out to improve the quality of the materials collected, with the aim of reaching 70% of separate waste collection. Unfortunately, these activities were suspended in early 2020 due to the health emergency and have not yet resumed, while the support continued for the preparation of the Business Plan according to the new criteria deliberated by ARERA [Italian Regulatory Authority for Energy, Networks and Environment].

Municipality of Reggio Calabria (178,760 residents)

In addition to the collaboration with the Metropolitan City of Reggio Calabria and in light of the critical waste management issues recorded by the municipal administration, CONAI was requested an extraordinary and urgent intervention to define a new plan with new separate waste collection systems and new collection models, anticipating rewards for compliant residents, and creating the conditions to achieve the minimum separate waste collection targets set by current legislation. After the first phase of data collection, identification of critical issues by neighbourhood, and all useful information, the activity should be concluded by the first quarter of 2021.

Municipality of Rende (35,526 residents)

The collaboration with the Municipal Administration essentially focused on the validation of the business plan according to the criteria set out by ARERA. The activity ended in December 2020.



PUGLIA

Municipality of Bari (327,361 residents)

The collaboration between CONAI, the municipal administration and AMIU Puglia, which began in 2015 and was subsequently extended, led to the definition of the new integrated separate waste collection system, which was implemented on the first macro-area serving a population of about 51,000 residents (*start-up* area 1).

During 2019, in the second *start-up* area (with about 100,000 residents), information kits and equipment were distributed to users. In October 2019 the new door-to-door collection system was launched in the Stanic neighbourhood (Villaggio del Lavoratore) affecting approximately 3,500 residents, and in December 2019 the system was launched in the neighbourhood of San Paolo, with an extension requested by the municipal administration, involving approximately 5,000 residents.

Finally, in December 2019, we started follow-up activities for start-up zone 1 (Santo Spirito, Palese, San Pio, Catino, San Girolamo, Fesca and San Cataldo neighbourhoods, for a total of about 50,000 residents)

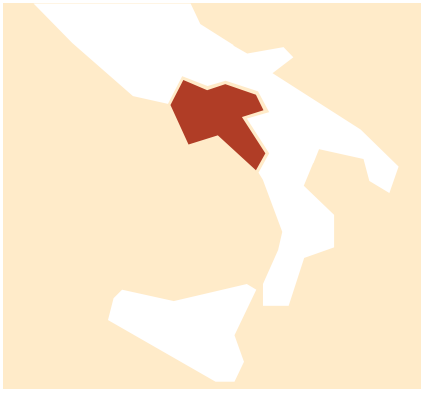
to assess the quality of door-to-door services and urban sanitation services in general. These activities were completed by the first quarter of 2020. The result achieved and consolidated in 2020 in the first phase exceed 75% of separate waste collection, with an increase of about 2% on the total percentage of the city (42%). For the sake of consistency in the extension of the service, which involves the provision of collection services throughout the municipality, and at the request of the municipal administration, it was decided to continue the service in 2020 and extend it to a further 80,000 residents. Unfortunately, due to the health emergency, the activity was suspended for some time, as *start-up* activities (delivery of kits and public awareness) are conducted almost completely face-to-face. Unless further critical issues arise in 2021, the activity will be implemented as agreed with the municipality.

Municipality of Taranto (196,702 residents)

The municipality asked CONAI for technical support for start-up, communication, and public awareness activities for residents and non-domestic users, with the aim of reorganising the entire urban sanitation service. The classic systems that will be implemented have been designed to better meet the needs of the area and its specificities: from door-to-door collection, which will involve 5 districts accounting for about 81% of the total waste produced, to the positioning of engineered street collection systems through the so-called Ecopoints or Engineered Collection Points (ECP), which cover the remaining 19% of urban waste production. In this case, too, the activity has been postponed to 2021 or to a time when health conditions will allow safe contact with users.

Optimal Management Area, Bari 8 (118,742 residents)

In the case of Monopoli (the lead municipality of ARO Bari 8, which includes the Municipalities of Conversano, Mola di Bari and Polignano di Bari, with a population of 118,742 residents), the collaboration between the parties involved was efficient and effective both in terms of time spent in sharing the objectives and the teamwork between all subjects involved, who had the objective of devising a shared model for the identification of a sole provider for the entire ARO.



CAMPANIA

After a series of critical issues that delayed the definition of certain technical aspects, the activities to support the development of separate waste collection in Campania were concluded in the first quarter of 2020 with the expiry of the Framework Agreement, as per the Extraordinary Programme signed in 2018 between the Region, ANCI Campania and CONAI, which involved 23 municipalities plus the city of Naples. In this context CONAI provided municipal administrations with technical support in the revision phase of some services and in start-up, communication, and public awareness activities.

Municipality of Benevento (60,000 residents)

The collaboration between CONAI, the public Service Provider, and the Municipal Administration started in February 2018 when separate waste collection was already at 61%. In February 2020 the separate waste collection services were reorganised, which involved the redesign of the door-to-door collection for glass packaging throughout the urban area and the integration of some accessory services. Subsequently, in the start-up phase the municipal administration managed to exceed the 65% target during the year and eradicated the issue of waste being abandoned next to the glass bins, especially at the border with other municipalities. Step 2 also involved trialling new organizational models for service pricing, with the aim of rewarding compliant residents who properly separate packaging waste and thereby improve its quality. With these objectives in mind, in March 2020 support was provided for the testing of the PAYT scheme, with a communication campaign in a defined neighbourhood of approximately 2,300 users, to achieve the following objectives: lower production of RMW (residual municipal waste), with a consequent reduction in disposal costs, and an improvement in the quantity and quality of the packaging fractions. The project includes two sequential steps: the first is a test phase, completed at the end of December 2020 and involving 164 users, and the second is a trial on the area being identified.

Project

TRIALLING OF PAYT SCHEME

MARCH 2020

2,300 USERS in Benevento

TESTING PHASE

END 2020

164 USERS involved

The collaboration between CONAI and **EDA CE (Caserta Management Area Authority - 104 municipalities - 924,000 residents**) began thanks to the Framework Agreement signed with the Campania region and ANCI Campania in 2018 and concerned the preparation of the Area Plan for the associated management of urban sanitation services. Despite the complexities related to the large number of municipalities involved, the activities focused on data collection, on the scaling of the collection, transport, recovery and disposal services for urban and equivalent waste, on feasibility scenarios for the

downstream management of collected materials, and on the technical, economic and financial aspects for the integrated service. Activities ended in September 2020.

EDA Napoli 1
(9 municipalities-1,315,397 residents)

Support activities to the EDA started in November 2019 and ended in December 2020 with the submission of the Area Plan. The collaboration focused first on technical support to prepare the feasibility study for the municipalities of ATO Napoli 1, which was presented in March 2020, and then on preparing the Area Plan in accordance with Regional Law 14/2016.

EDA Salerno
(161 municipalities - 1,108,314 residents)

In this case, too, the objective was to provide technical support to the Salerno EDA for the preparation of the Plan for the entire province, in line with the provisions of Regional Law no. 14/2016 and the guidelines for the preparation of the Area Plan. We also focused on achieving plant management autonomy and ensuring economic sustainability to remedy service fragmentation and the lack of infrastructure for the management of organic and non-recyclable fractions. In spite of the large number of municipalities, the EDA managed to coordinate all the activities of the 161 municipalities and submitted the preliminary plan to the Region for the SEA phase. The province of Salerno currently has a separate waste collection rate of 64.4%; with the implementation of the Area Plan, the objective is to exceed 75% at full operation. Support started in January 2020 and is expected to be completed by mid-2021.

EDA Napoli 2
(24 municipalities - 711,431 residents)

CONAI and EDA worked together in 2020 with the aim of preparing the Plan for the associated management of services for all 24 municipalities, in compliance with Regional Law n. 14/2016. The activities are ongoing and the collaboration is expected to conclude by early 2021. Currently the separate waste collection rate in the province is 50.14%, but with the implementation of the Area Plan, the EDA Napoli 2 aims to reach at least 65% at full operation.

EDA Avellino
(114 municipalities - 415,018 residents)

CONAI is providing support to the EDA to prepare the Plan on a provincial scale, in line with the provisions of Regional Law 14/2016 and with the existing activities of all other EDAs in the region. In February 2020, activities started with the data collection and validation phase and, despite the COVID health emergency, they are expected to terminate in early 2021. In 2019 the province had a separate waste collection rate of 64.3%, but with the implementation of the Area Plan, the EDA expects to reach the target of 70% at full capacity.

EDA Benevento
(79 municipalities – 278,000 residents)

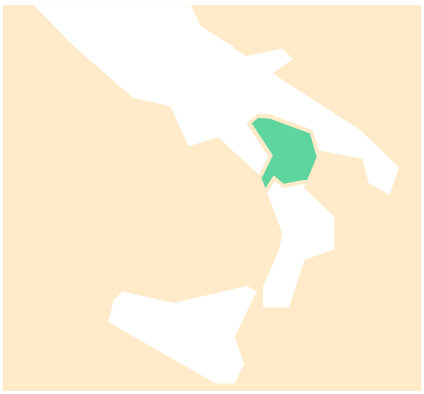
In this case, too, technical support to the EDA is aimed at the preparation of the provincial Area Plan. Initially, activities focused on data collection and validation and on the scaling of the service, considering that the separate waste collection performance of the province of Benevento is already very high: 71.9% as of 2019. Completion of the activities is expected in early 2021 and, with the implementation of the Area Plan, separate waste collection is expected to reach 75% when fully operational.

Casoria Ambiente
(77,000 residents)

In this first phase, support activities (which started in January 2020 and concluded in July) involved a review and update to the urban sanitation industrial

plan of the in house provider. At the end of this activity, the municipal administration requested further technical support to CONAI, envisaging the possibility of a significant intervention on a new communication and public awareness campaign, product analysis, and the implementation of a waste flow traceability system. The activity started in November 2020 and is expected to be completed by mid-2021.

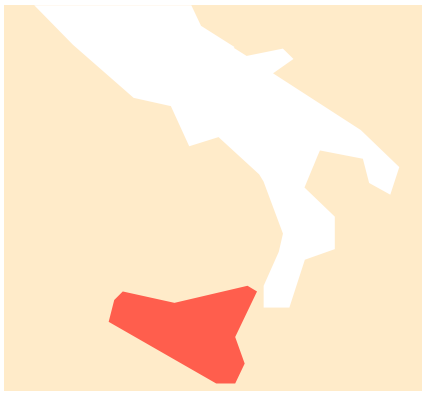
In addition, throughout 2020, on EDAs' request CONAI provided technical support to validate the Business Plans (PEF), according to ARERA resolutions by ETC (Enti Territorialmente Competenti, local authorities). Specifically, the entities involved were: EDA Caserta, EDA Salerno, EDA Benevento, EDA Avellino, EDA Napoli 1, EDA Napoli 2, EDA Napoli 3.



BASILICATA

Sub-Area of Matera
(116,000 residents in the 5 municipalities of: Matera - lead Municipality, Bernalda, Irsina, Tricarico and Ferrandina)

After the completion of the tender procedures for the assignment of the new separate waste collection service for the Matera sub-area, the lead Municipality of Matera requested technical support from CONAI for the start-up phase and for communication, information and public awareness activities for the correct separation of packaging waste. After several discussions with the municipal administration and the provider during the handover phase, both parties decided to temporarily suspend activities.



SICILY

Through the sharing and stipulation of an Annex to the 2019 Agreement (signed by the Ministry of the Environment, the Region, and CONAI), the Region was able to release regional and ministerial funds referenced in the 2011 Agreement between the same entities in favour of the most populous municipalities with a separate waste collection rate below 25%. These include the three Metropolitan cities of Palermo, Catania and Messina. These activities were terminated at the end of last year and barring any unsafe health situations they will restart by the first quarter of 2021.

Municipality of Palermo (638,000 residents)

The support activities for the municipality of Palermo started with the project "Palermo Differenzia 2" (6 steps – 120,000 residents). This follows on from the first step, which involved 130,000 residents and started a few years earlier, although in this new phase the critical issues have been greater and have delayed activities.

In 2019, start-up and public awareness activities focused on step 4 of the project in order to implement separate waste collection in the areas of the city not yet serviced. The collaboration continued in the early months of 2020, but had to be discontinued due to the pandemic and the health situation, as the activity required direct contact with users. This activity was suspended for the whole first half of the year and restarted in the second half, with the aim of completing the extension of the second step by mid-2021.

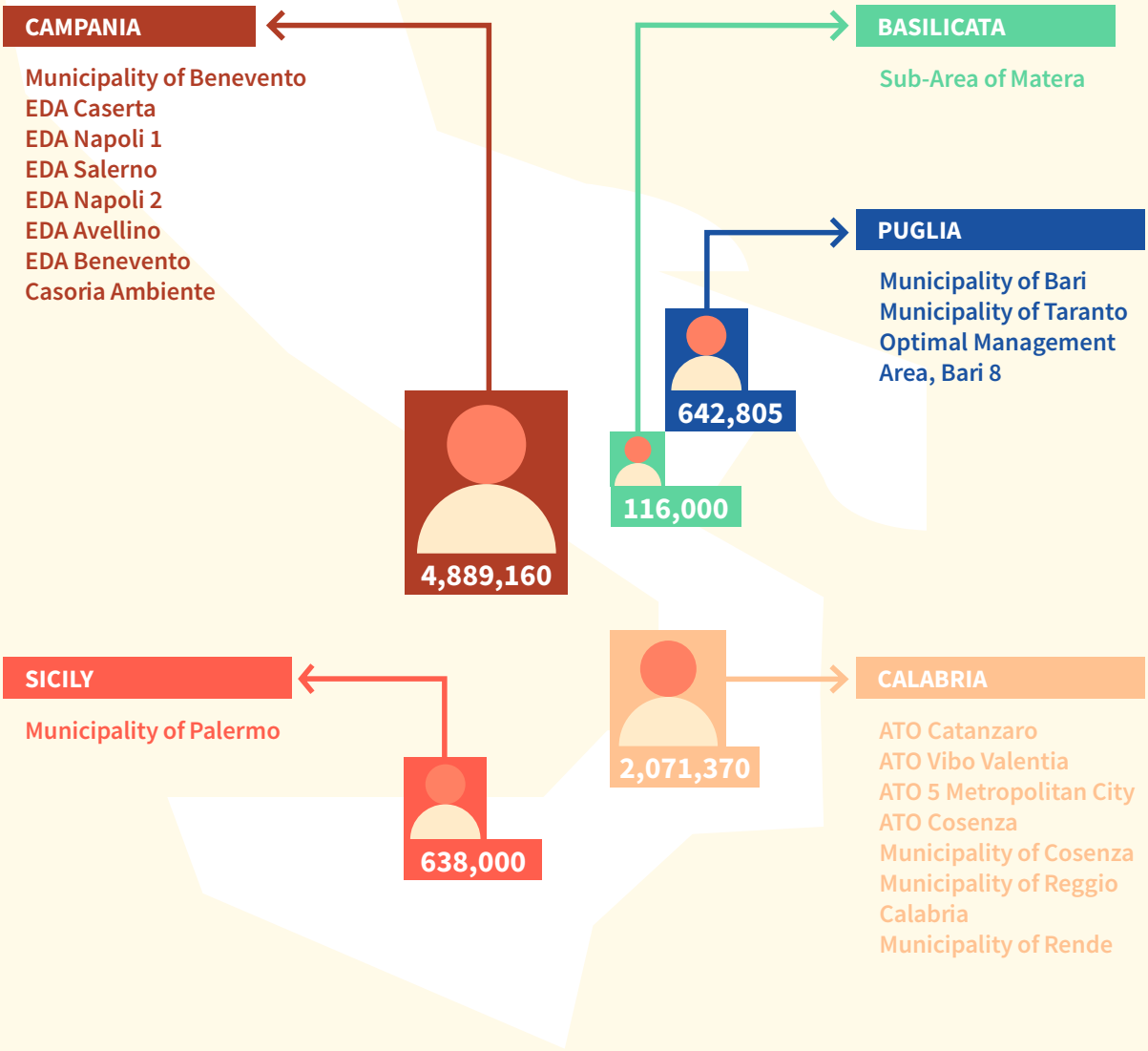
2019 results indicate that the average separate waste collection rate was 17.40% across the entire city. In the area involved in the "Palermo Differenzia 1" project (130,000 residents) the rate was 52.6%, with a high incidence of waste migration to neighbouring areas where street bins are still present. In the "Palermo Differenzia 2" area (120,000 residents - steps 3-6) the rate was 62.8%.

Second edition of Sicilia Munnizza Free

The collaboration with Legambiente Sicilia continues on after the success of the first editions. The assistance provided to municipalities through Legambiente's initiatives—making available to them all the experience gained with exemplary Central and Southern municipalities and the technical know-how for managing the Conventions under the Anci-CONAI Framework Agreement—was one of the main driving forces behind the events promoted as part of the edition of Munnizza Free aimed at the dissemination of good practices.

In particular, three macro areas of intervention were identified: the organisation of 9 provincial Ecoforums on the correct management of packaging waste; the organisation of 3 Ecofocus on the three metropolitan cities (Palermo, Catania, Messina) involving the companies managing the collection service; and the organisation of 3 regional workshops with the aim of educating/informing the municipalities on some more general themes, with the involvement of sector consortia.

CONAI PROJECTS FOR THE DEVELOPMENT OF QUALITY SEPARATE WASTE COLLECTION IN 2020



TOTAL NO. OF RESIDENTS INVOLVED
8,357,335

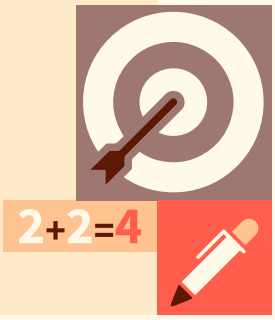
In 2020-2021, special local projects will involve **17 MILLION RESIDENTS**

ATO: Optimal Management Area
EDA: Management Area Authority
SAD: Sub-Area District
ARO: Optimal Collection Area

INTEGRATED WASTE CYCLE in the SOUTHERN AND CENTRAL REGIONS

ESTIMATION of PLANT REQUIREMENTS

HIRINGS
BASED ON PROJECTIONS



In order to **estimate** the **2030 EU Separate Waste Collection targets,** the national trend of waste production **was assessed.** Given the slight deviation (up and down) from 2011 to date, we resolved to **base the projection on the data** available in the ISPRA 2020 Report, according to the following **assumptions:**

- For **composting** and **MBT (Mechanical Biological Treatment)** plants, the **difference** between the **2030 target** in terms of tonnes/year and the currently **permitted quantity** was used. The latter was based on the ISPRA data on plants and related permitted quantities as of 2019 (ISPRA Report 2020).
- For **sorting** and **soil, absorbent, and bulky** waste treatment plants, the difference between the **2030 estimations** and **ISPRA 2019** quantities was used, assuming that the existing plants are sufficient to treat the quantities produced today;
- For **municipal and waste-to-energy landfills,** it was assumed that out of the material entering the new MBT plants, 70% goes to waste-to-energy, 5% is process loss and further recovered material (mostly metals), and 25% is non-recoverable material (low calorific value) to be disposed of in landfills.

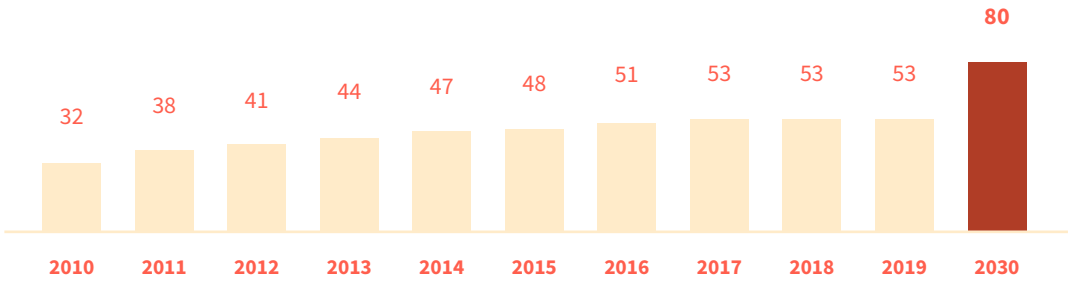
The following **estimate** identifies the **plant requirements** to **autonomise Central and Southern** regions, enabling them to achieve the **EU 2030 targets.**

ESTIMATED PLANT REQUIREMENTS

WITH SEPARATE WASTE COLLECTION > 65%

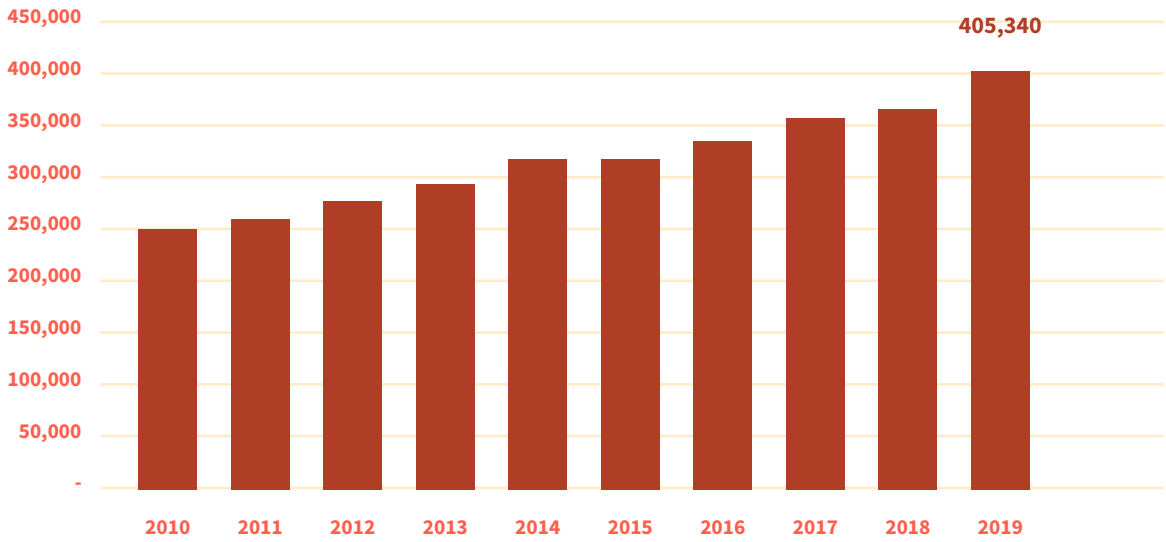
CAMPANIA

% SEPARATE WASTE COLLECTION



SOURCE ISPRA Report 2020

PACKAGING MANAGED UNDER ANCI-CONAI PARTNERSHIP AGREEMENT



SOURCE CONAI calculations based on supply chain Consortia data

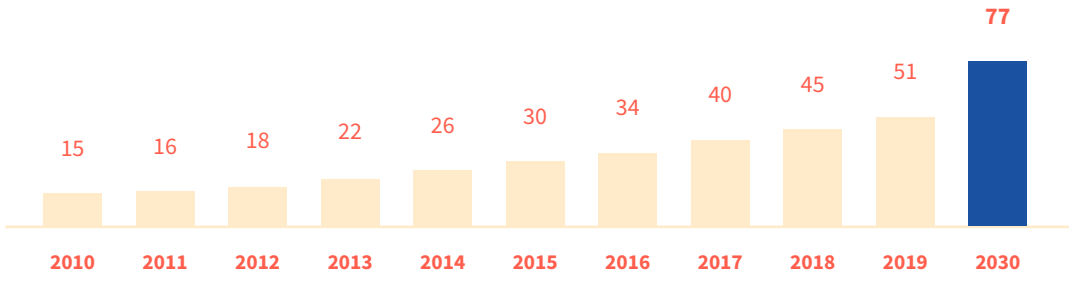
Data (tonnes)

ESTIMATED 2030 PLANT REQUIREMENTS AT FULL CAPACITY

	Number of plants	Investment (million euros)*	Number of employees
Combined aerobic-anaerobic composting facilities	15	192	225
Aerobic composting facilities	-	-	-
Sorting Facilities	3	39	105
Soil treatment facilities	6	15.6	42
Absorbent waste treatment facilities	6	24	60
Bulk waste facilities	4	6	56
Municipal Landfills	4	84	52
Waste-to-energy plants	-	-	-
TOTAL	**38**	**360.6**	**540**

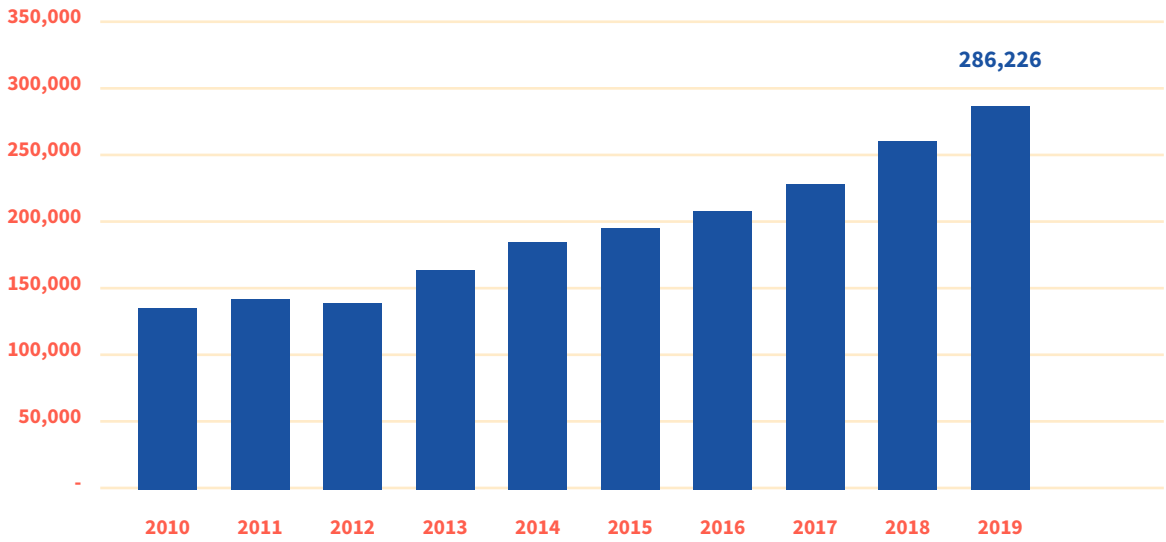
PUGLIA

% SEPARATE WASTE COLLECTION



SOURCE ISPRA Report 2020

PACKAGING MANAGED UNDER ANCI-CONAI PARTNERSHIP AGREEMENT



SOURCE CONAI calculations based on supply chain Consortia data

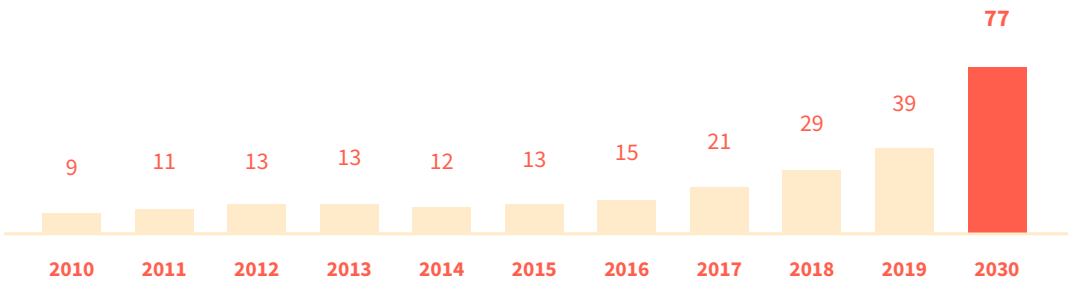
Data (tonnes)

ESTIMATED 2030 PLANT REQUIREMENTS AT FULL CAPACITY

	Number of plants	Investment (million euros)*	Number of employees
Combined aerobic-anaerobic composting facilities	5	64	75
Aerobic composting facilities	-	-	-
Sorting Facilities	2	26	70
Soil treatment facilities	5	13	35
Absorbent waste treatment facilities	4	16	40
Bulk waste facilities	1	1.5	14
Municipal Landfills	4	88	52
Waste-to-energy plants	0.67	134.4	20.15
TOTAL	**22**	**342.9**	**306**

SICILY

% SEPARATE WASTE COLLECTION



SOURCE ISPRA Report 2020

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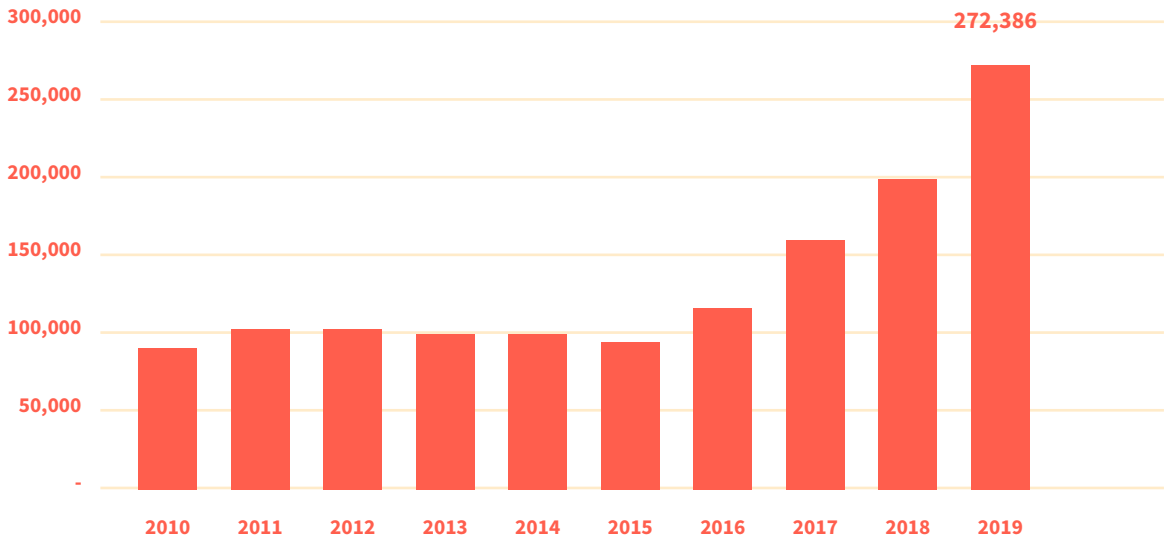


SOURCE CONAI calculations based on supply chain Consortia data

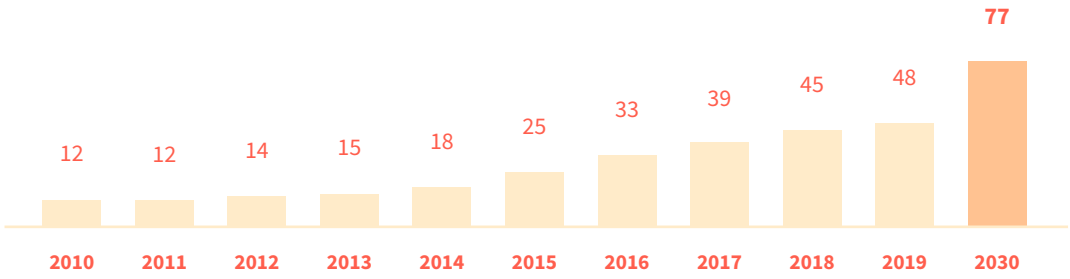
Data (tonnes)

ESTIMATED 2030 PLANT REQUIREMENTS AT FULL CAPACITY

	Number of plants	Investment (million euros)*	Number of employees
Combined aerobic-anaerobic composting facilities	9	115.2	135
Aerobic composting facilities	-	-	-
Sorting Facilities	4	52	140
Soil treatment facilities	8	20.8	56
Absorbent waste treatment facilities	5	20	50
Bulk waste facilities	3	4.5	42
Municipal Landfills	5	125	65
Waste-to-energy plants	1	200	30
TOTAL	**35**	**537.5**	**518**

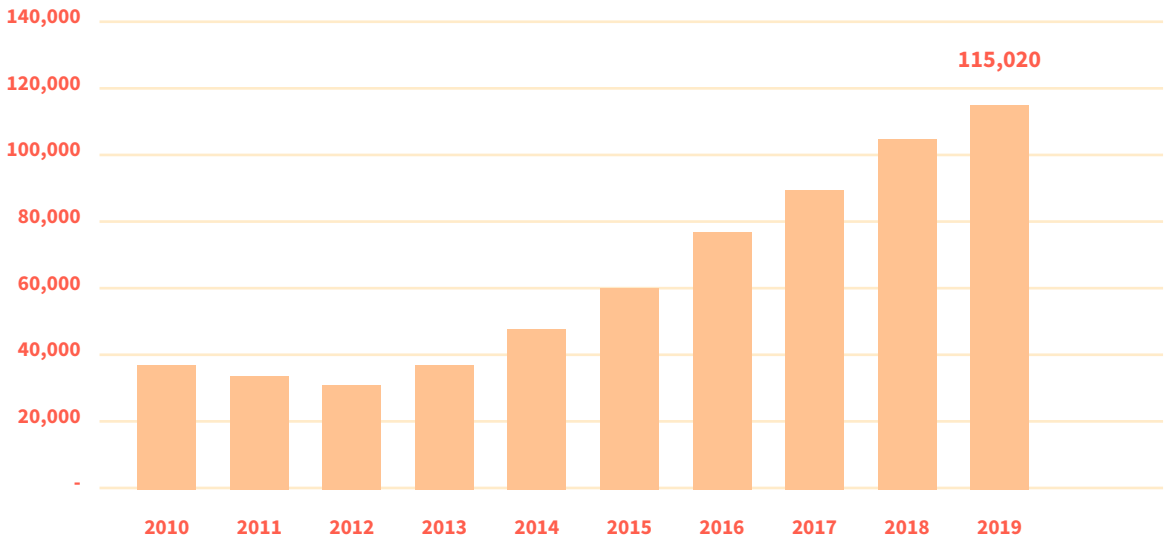
CALABRIA

% SEPARATE WASTE COLLECTION



SOURCE ISPRA Report 2020

PACKAGING MANAGED UNDER ANCI-CONAI PARTNERSHIP AGREEMENT



SOURCE CONAI calculations based on supply chain Consortia data

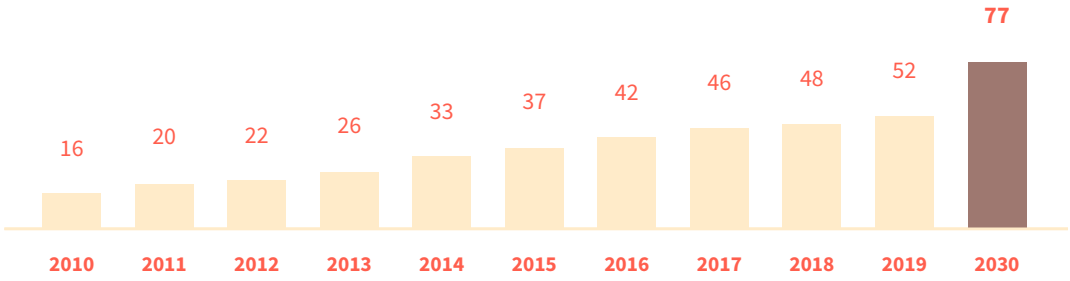
Data (tonnes)

ESTIMATED 2030 PLANT REQUIREMENTS AT FULL CAPACITY

	Number of plants	Investment (million euros)*	Number of employees
Combined aerobic-anaerobic composting facilities	2	25.6	30
Aerobic composting facilities	-	-	-
Sorting Facilities	1	13	35
Soil treatment facilities	3	7.8	21
Absorbent waste treatment facilities	2	6.4	16
Bulk waste facilities	1	1.5	14
Municipal Landfills	2	48	26
Waste-to-energy plants	0.26	52.4	7.86
TOTAL	**11**	**154.7**	**150**

LAZIO

% SEPARATE WASTE COLLECTION



SOURCE ISPRA Report 2020

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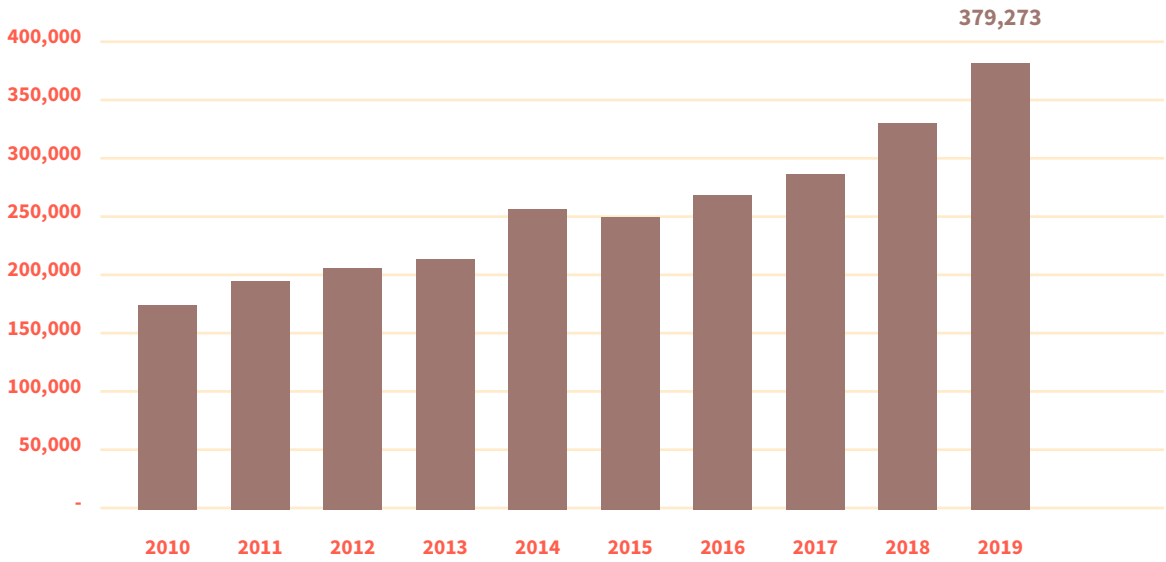


SOURCE CONAI calculations based on supply chain Consortia data

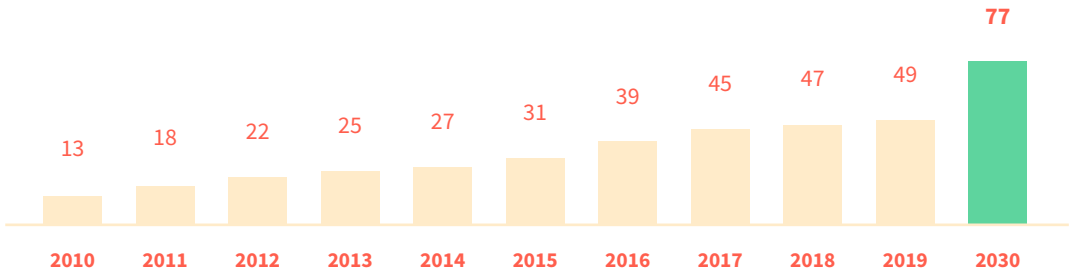
Data (tonnes)

ESTIMATED 2030 PLANT REQUIREMENTS AT FULL CAPACITY

	Number of plants	Investment (million euros)*	Number of employees
Combined aerobic-anaerobic composting facilities	19	243.2	285
Aerobic composting facilities	-	-	-
Sorting Facilities	3	39	105
Soil treatment facilities	6	15.6	42
Absorbent waste treatment facilities	7	26.8	67
Bulk waste facilities	2	3	28
Municipal Landfills	6	108	78
Waste-to-energy plants	1	200	30
TOTAL	**44**	**635.6**	**635**

BASILICATA

% SEPARATE WASTE COLLECTION



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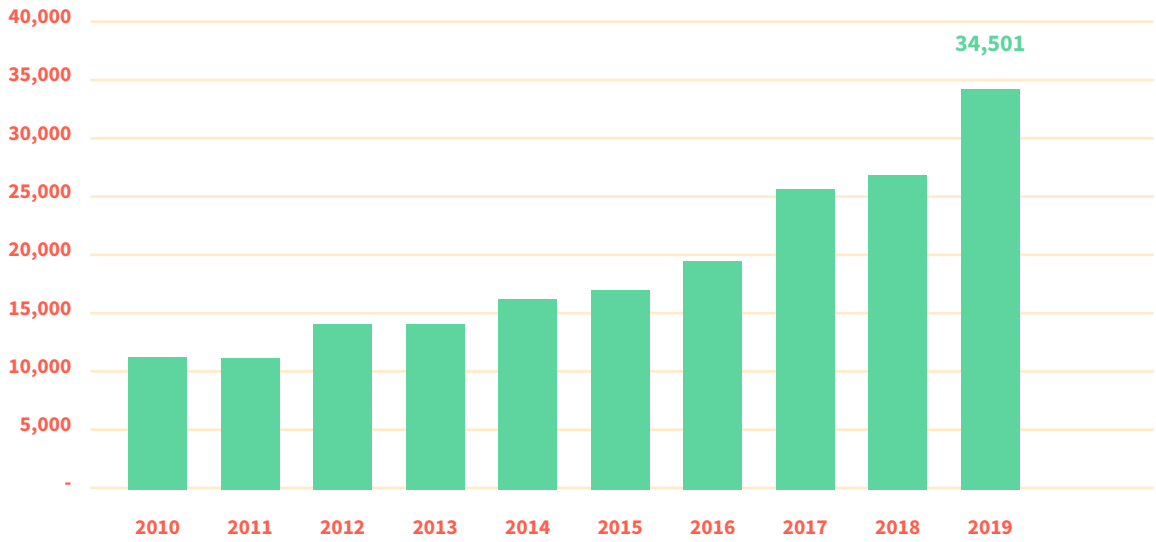

SOURCE CONAI calculations based on supply chain Consortia data

Data (tonnes)

ESTIMATED 2030 PLANT REQUIREMENTS AT FULL CAPACITY

	Number of plants	Investment (million euros)*	Number of employees
Combined aerobic-anaerobic composting facilities	2	25.6	30
Aerobic composting facilities	-	-	-
Sorting Facilities	-	-	-
Soil treatment facilities	1	2.6	7
Absorbent waste treatment facilities	1	2	5
Bulk waste facilities	1	1.5	14
Municipal Landfills	1	23	13
Waste-to-energy plants	0.7	13.3	1.99
TOTAL	**6**	**68**	**71**

ESTIMATE OF THE PLANT REQUIREMENTS
TO AUTONOMISE CENTRAL AND SOUTHERN REGIONS

ESTIMATED 2030 PLANT REQUIREMENTS AT FULL CAPACITY

	Number of plants	Investment (million euros)*	Number of employees
Combined aerobic-anaerobic composting facilities	55	665.6	780
Aerobic composting facilities	2	10	22
Sorting Facilities	14	174	475
Soil treatment facilities	31	80.6	217
Absorbent waste treatment facilities	25	99.2	248
Bulk waste facilities	14	21	196
Municipal Landfills	24	515	312
Waste-to-energy plants	3	600	90
TOTAL	**165**	**2,165.4**	**2,340**

CONAI

CONSORZIO NAZIONALE IMBALLAGGI