



# **MUNICIPAL WASTE: Case-studies of successful transitions from taxation to Pay-as-you-throw fee**

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**[www.ies.it](http://www.ies.it)**



# ABOUT I&S

# Over 30 years of experience

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## Key Milestones



1991

I&S is founded by a group of engineers with a passion for **environmental issues and information technology**

1996

We developed the **first WebGIS** in Italy (ENEL project)

2001

We developed the **first web-based software for PAYT management** of the waste collection services for Consorzio Priula (Contarina SpA)

## **The software and solutions provider for multiutilities**

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Today, we're proud to be a reliable technological partner for many top players in the Waste Collection sector serving more than 200 municipalities all over Italy.



- **Specialised in PAYT since 2001**
- **Multidomain expertise and team (RFID, GIS, web, IoT, CAD, GPS, etc)**
- **Over 30 years of experience**
- **Verticalized know-how and product suite**
- **Innovative SME (12% of revenue reinvested in R&D)**

# Some of our customers in the waste management sector





**PAY AS YOU THROW:  
why, when, how, where?**

## Pay as you throw: WHY?



### WHY?

- **FAIR**

By charging citizens according to the amount of residual, organic, and bulky waste they dispose, it applies the “polluter pays” principle at granular level.

- **EDUCATIONAL**

Research shows PAYT encourages citizens into taking active part in protecting the environment, while also increasing environmental impact awareness and making users more responsible in general, towards producing and recycling waste.

- **SUSTAINABLE**

Research has shown how PAYT significantly decreases both the total amount of waste per capita and the amount of non-recyclable waste.

Today many PAYT Municipalities in Italy, especially in the North-Eastern regions, demonstrate, numbers in hand, that their citizens **pay less for a better service.**

## Pay as you throw: WHEN?

- **1997**

The Italian law «**Decreto Ronchi**» introduces the basic principles that have led to the passage from a tax (TARI) to a Pay-As-You-Throw tariff (TARIP or TARIC), for the waste collection and management services, giving substance to the concept “*who pollutes pays*” or, in other words, “*who produces less waste should pay less*”.

- **2000-2002**

Despite the fact the Ronchi law bears no legal obligation, **Priula Consortium** (nowadays by Contarina SpA) is one of the very first to embrace this concept; they partner up with **I&S** to make it happen.

- **2002 onwards**

Several other Waste Collectors, encouraged by **Contarina SpA's results**, embrace the PAYT approach. I&S has been supporting many of them in implementing each step from taxation to PAYT, adopting different technical solutions tailored to each territory and case

→ **There are many ways to measure!**



- more efficient service
- less waste disposed
- improved citizens satisfaction
- increased amounts of recycled items



## Pay as you throw: WHEN?

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- **2017**

A **new Decree** is issued: it specifies the “Criteria for the implementation of **pay as you throw waste measurement** by Municipalities» and summarizes the best practices already in use among the few pioneers mentioned.

Municipalities embracing PAYT have grown in number, but only a minority of the overall territory and population pays for what they throw: **less than 10%**

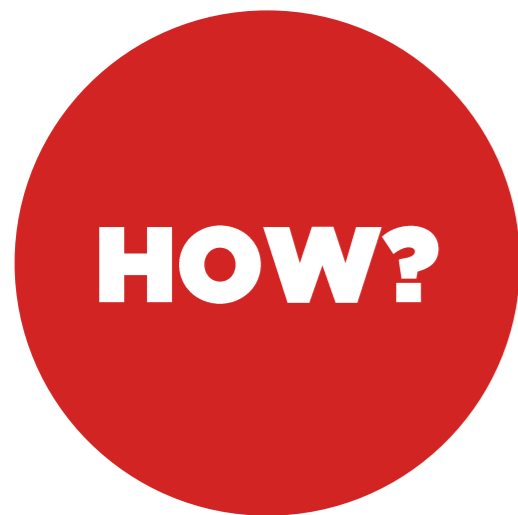
- **2018**

ARERA (Italian Authority for Energy, Networks and Environment) is tasked with optimizing the Waste Management sector. New indications and regulations are issued: albeit indirectly, **ARERA pushes Municipalities and Collectors to embrace PAYT**, requesting them to start measuring quantity and quality of the Service.



# Pay as you throw: HOW?

## THE 4 STEPS MODEL



Excerpt from the Manual «*Rivoluzione TARIP*» by Pier Luigi Fedrizzi, I&S CEO

The application of the PAYT billing requires a **paradigm shift** by all of the actors involved. It implies moving from a *bureaucratic* type of management to an *Industry 4.0* one, while applying an **organizational process** that can be outlined in a time chain of 4 steps. The adherence to the steps order, a correct startup and the right choice of **enabling technologies** are the basic conditions to achieve an efficient and "ARERA-compliant" service management.

# Pay as you throw: HOW?



Import/creation of database (including users, contracts, streets, house numbers, etc) into ERP to normalize and improve it.

Ideally, it would be advisable to run a digital survey of all of the house numbers on the territory as step 0.

Fundamental step for a correct matching of containers and users.

Every waste bin is identified with a code and needs a reliable RFID tag installed. The containers are then distributed and associated to users to enable the measurement.

Operators and vehicles must be equipped with monitoring systems such as GPS, GSM, RFID and other technologies in order to monitor and register emptyings.

During the first few months it is essential to check for any orphan containers, i.e. not associated with any user.

Time to reap the fruit of the previous steps! Ironically this is the easiest step, as calculating and issuing a bill can be done with any software, if the data collected is solid. But, having an impact on the financial aspects, it's essential that the previous 3 steps are firmly executed and implemented to ensure a smooth result.

## Pay as you throw: WHERE?

ISPRA, the Italian Institute for Environmental Protection and Research, surveys Municipalities annually to collect data around application of PAYT in Italy.

In 2021 **over 1000 municipalities in Italy, mainly located in the North-East, declared to apply a PAYT system** for billing waste services.

The **leading region is Veneto**, for both number of municipalities and population served.

To be noted that most of the Municipalities that do apply the PAYT billing method **have aggregated into Consortiums that delegate the management of waste collection service to in-house Public Companies.**

### Municipalities applying PAYT in Italy (2021)



Source: ISPRA report 2022

The background is a solid red color with a repeating pattern of small, light red icons. These icons represent various concepts such as technology (Wi-Fi, smartphone, mail), business (chart, bar graph, magnifying glass), communication (speech bubble, person), and general utility (trash can, calendar, globe).

# CASE HISTORIES

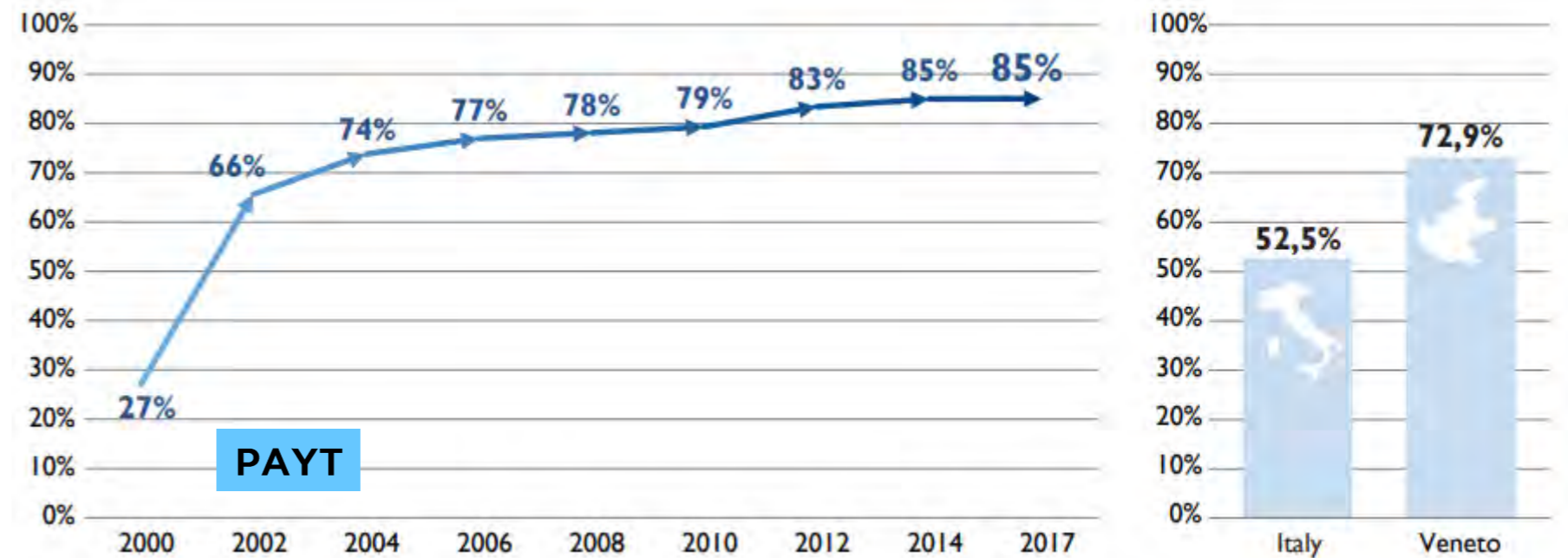
# Case Histories: Contarina S.p.A. (2000-> today)



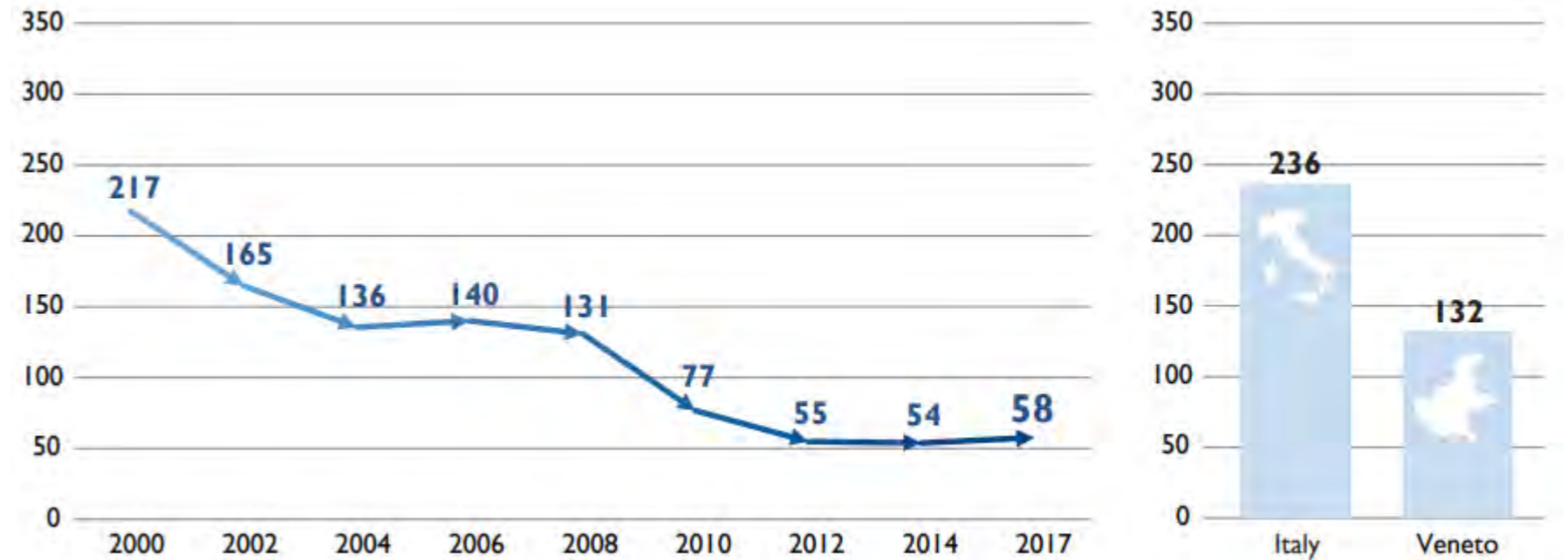
Region: Veneto  
 Province: Treviso  
 Municipalities: 49  
 Population: 557.000  
 Territory (km<sup>2</sup>): 1.300  
 Recycling %: >89%  
 RW production (Kg/capita): ~42

SOURCE: Contarina 2021

Percentage of recycled waste in the municipalities managed by Contarina



Residual waste production, managed by Contarina



Source: Contarina 2017, ISPRA waste report 2017

## Case Histories: Fiemme Servizi S.p.A. (2004 ->)



**Fiemme Servizi**



Region: Trentino-Alto Adige  
 Province: Trento  
 Municipalities: 11  
 Population: 30.000  
 Territory (km<sup>2</sup>): ~ 415  
 Recycling %: >84%

Percentage of recycling in the municipalities managed by Fiemme Servizi S.p.A.



Source: Fiemme Servizi 2022

SOURCE: Fiemme Servizi 2022

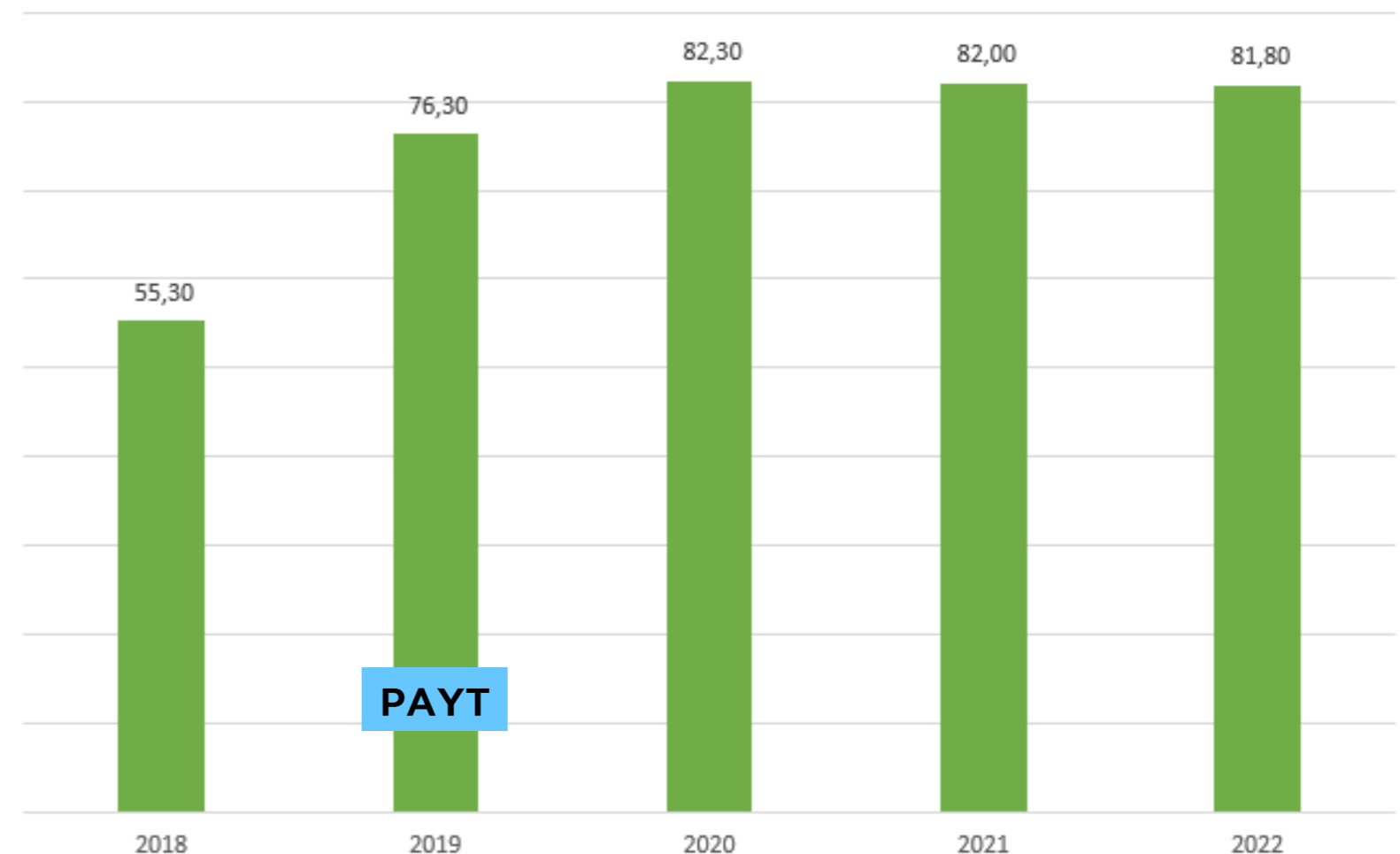
## Case Histories: Alea Ambiente S.p.A. (2018 ->)



Region: Emilia Romagna  
Province: Forlì-Cesena  
Municipalities: 13  
Population: 180.000  
Territory (km<sup>2</sup>): 1014  
Recycling %: ~ 82%  
RW production (Kg/capita): 83

SOURCE: Alea Ambiente S.p.A. 2022

Percentage of recycling in the municipalities managed by Alea Ambiente S.p.A.



Source: Alea Ambiente S.p.A. 2022

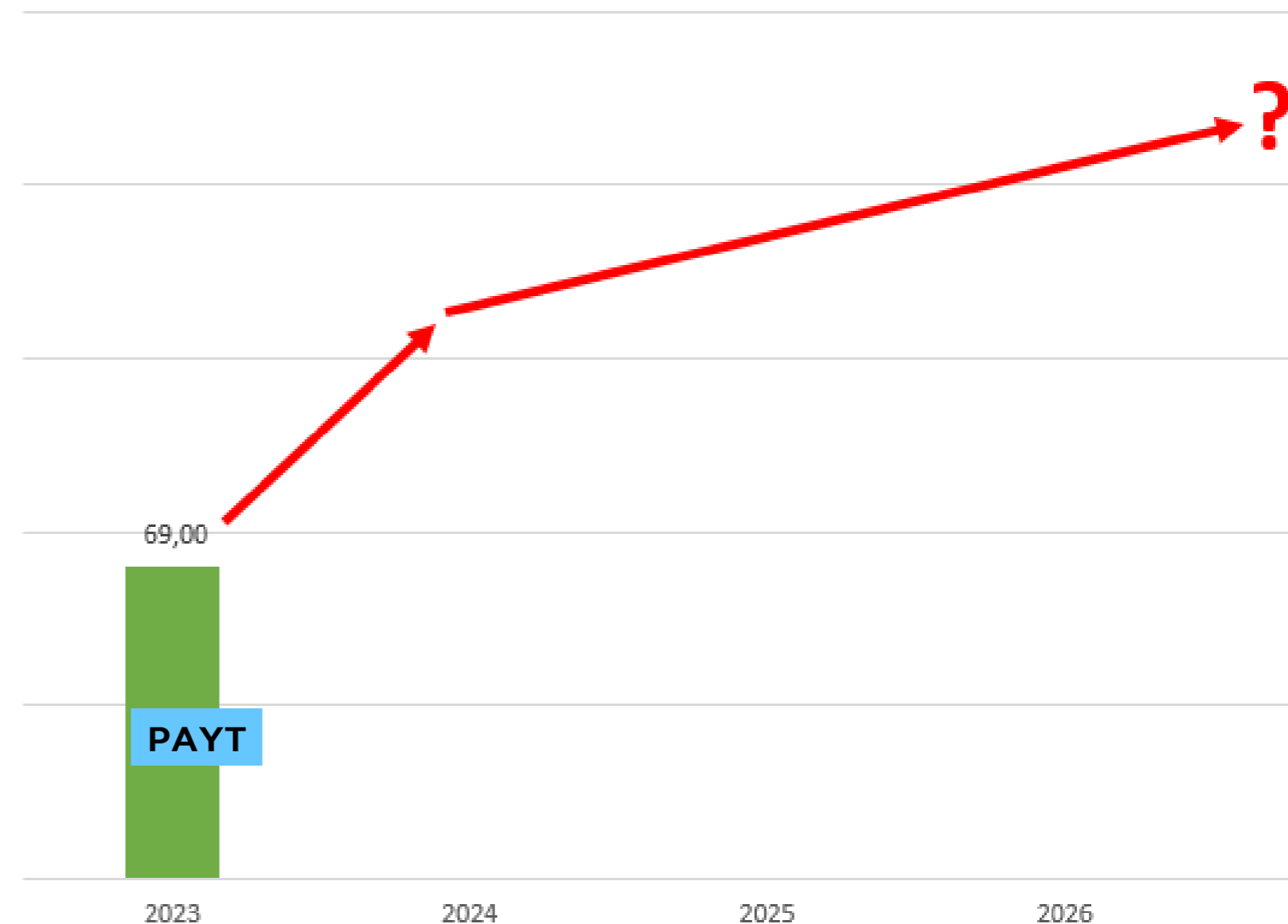


## Case Histories: Ecoambiente S.r.l. (2023 ->)



Region: Veneto  
Province: Rovigo  
Municipalities: 50  
Population: 247.000  
Territory (km<sup>2</sup>): 1700  
Recycling %: ~ 69%

Percentage of recycling in the municipalities managed by Ecoambiente S.r.l. (projection, project starting in 2023)



SOURCE: ARPAV – Urban Waste Report 2022

## Icing on the cake: how much you could save by PAYT

The table below shows the costs per inhabitant for urban hygiene services in Italy, split by macroareas.

The **blue** column shows the average costs per capita in each area and overall for Italy: **175,79 €/capita**. The **green** column shows the average costs per capita where PAYT is applied: **139,28 €/capita**.

According to data, applying PAYT to the whole of Italy, we could save up to **2.272 million euros** (considering average Italy PAYT costs). If we managed to apply average North-East PAYT costs, we could reach an astonishing saving of **3.498 million euros**.

Macro Area Statistics	Italy Municip.	Italy Population	PAYT Municip. n°	PAYT Municip. %	PAYT Population n°	PAYT Population %	Waste kg/capita	Italy Recyc. %	Italy Costs €/capita	PAYT Recyc. %	PAYT Costs €/capita	Recyc. var. %	Costs var. €/capita	Savings ITALY M€	Savings North East M€
Nord East	1.069	7.193.880	530	60,78%	3.083.452	47,48%	441,1	73,2%	142,79	79,7%	118,92	6,6%	23,9	25,85	172,29
North West	2.762	14.570.845	219	25,11%	1.396.200	21,50%	480,0	69,3%	146,37	83,0%	136,87	13,7%	9,5	104,16	400,76
North Center	835	9.732.974	119	13,65%	1.945.307	29,95%	586,3	64,3%	198,48	81,9%	180,41	17,6%	18,1	584,58	782,71
Center	698	8.264.229	2	0,23%	22.338	0,34%	475,7	56,5%	210,37	78,3%	205,70	21,8%	4,7	577,58	745,81
South Center	441	1.608.035	0	0,00%	0	0,00%	ND	60,7%	163,46	ND	ND	ND	ND	36,68	69,41
South Center	1.342	12.275.792	1	0,11%	37.667	0,58%	479,1	51,2%	192,85	49,3%	149,96	-1,9%	42,9	630,51	880,40
Islands	767	6.598.884	1	0,11%	9.421	0,15%	440,0	47,2%	186,87	76,7%	165,05	29,5%	21,8	312,35	446,68
<b>Averages and totals</b>	<b>7.914</b>	<b>60.244.639</b>	<b>872</b>	<b>11,0%</b>	<b>6.494.385</b>	<b>10,8%</b>	<b>491,0</b>	<b>61,3%</b>	<b>175,79</b>	<b>81,2%</b>	<b>139,28</b>	<b>19,9%</b>	<b>36,5</b>	<b>2.272</b>	<b>3.498</b>

Source: ISPRA report 2020



**THANK YOU  
FOR YOUR  
ATTENTION**

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