

“New instruments and technology for waste management”



Gruppo Sartori Ambiente



SARTORI AMBIENTE
SOLUZIONI PER L'ECOLOGIA

**Contenitori e sistemi per la
raccolta differenziata**

Passione e competenza per aiutarvi ad
individuare il sistema di raccolta adatto alle
vostre esigenze

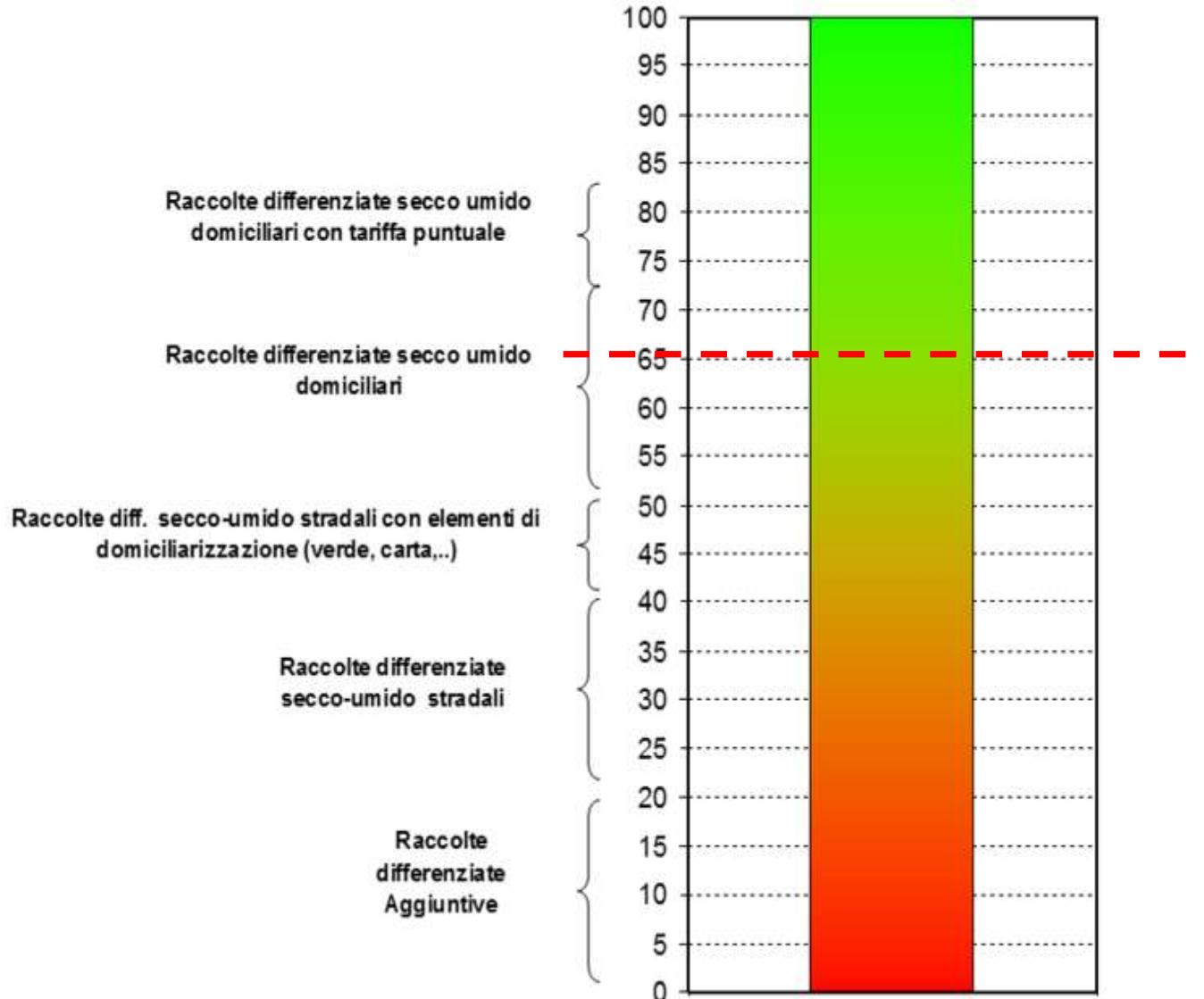


ALTARES
GREEN TECHNOLOGY

**Sistemi d'identificazione Rfid e
GPS per la raccolta differenziata**

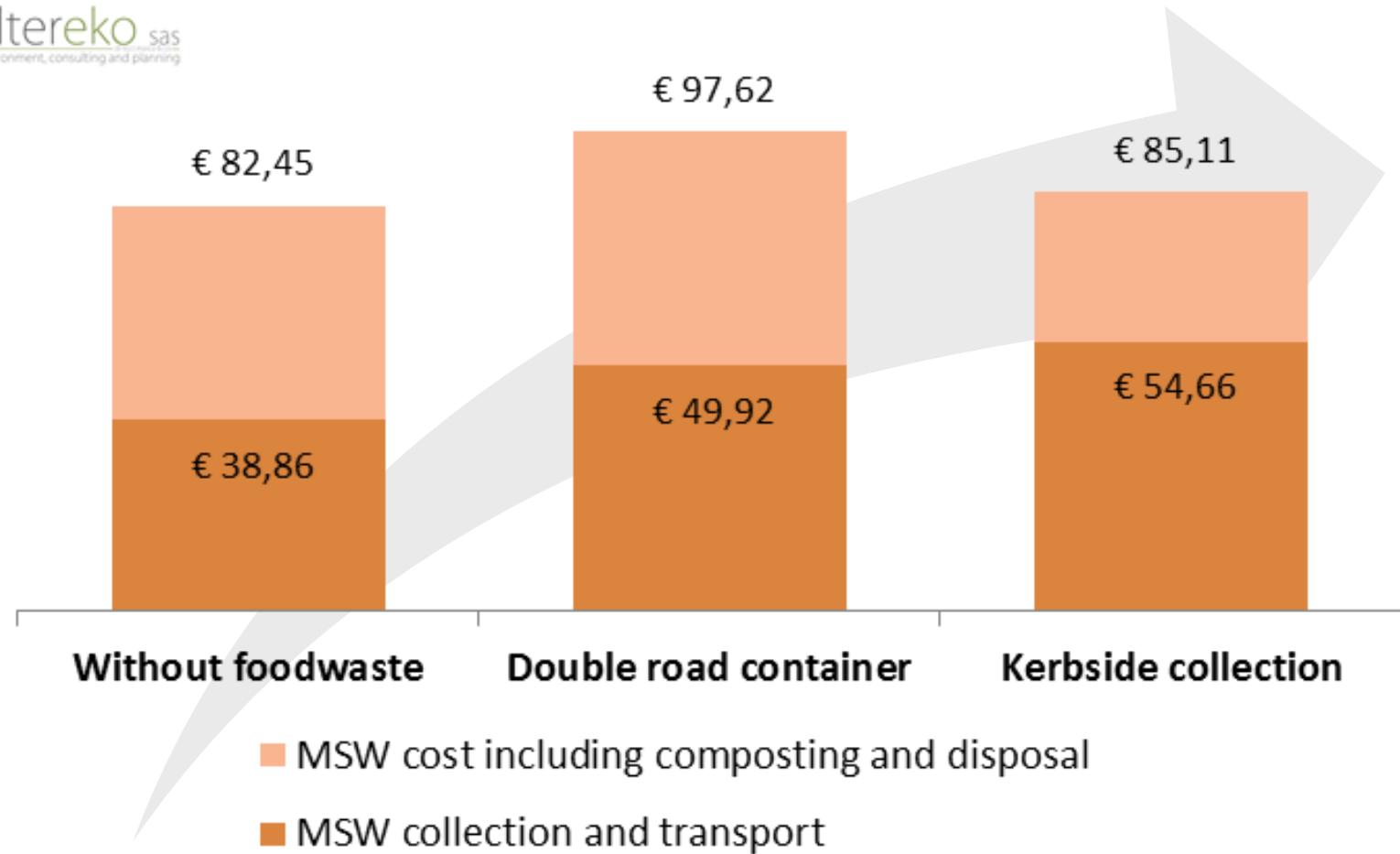
La tecnologia a servizio della raccolta rifiuti e
della tariffazione

TARGETS needs FOOD WASTE SEPARATION and DOOR TO DOOR COLLECTION



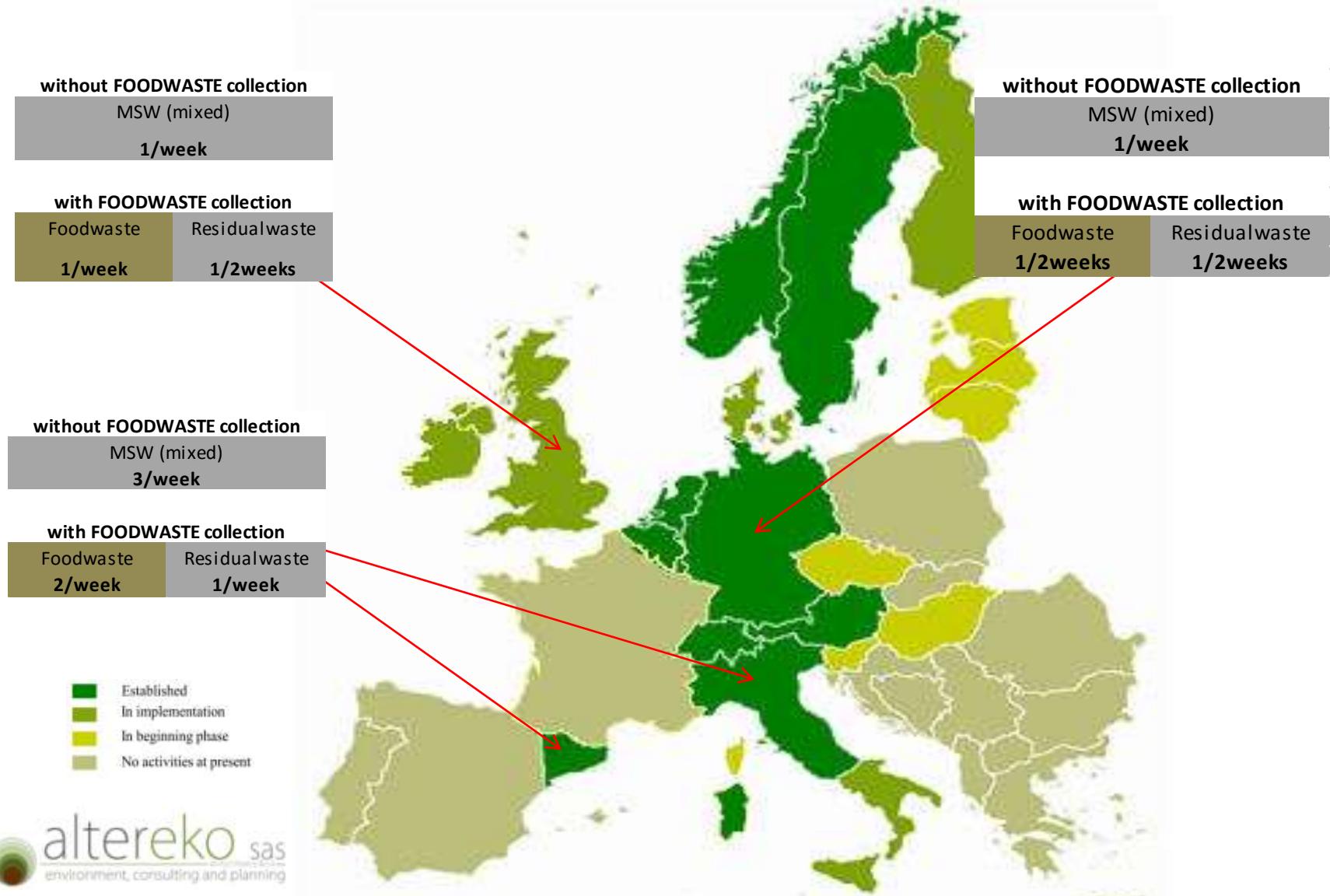
MSW management cost are stable for increasing complexity of MSW management

MSW management cost for different collection schemes (€/inhab)



Region Veneto (Italy); data evaluated by the Marco Ricci (Alterecko sas); 2009

Introduction to an integrated MSWM- ROLE OF FOOD WASTE



BIOWASTE COLLECTION requires proper TOOLS

Single houses or up to 6 families per building



OR



10 lt. kitchen caddy and compostable bags

23 lt. kerbside container

Home composter

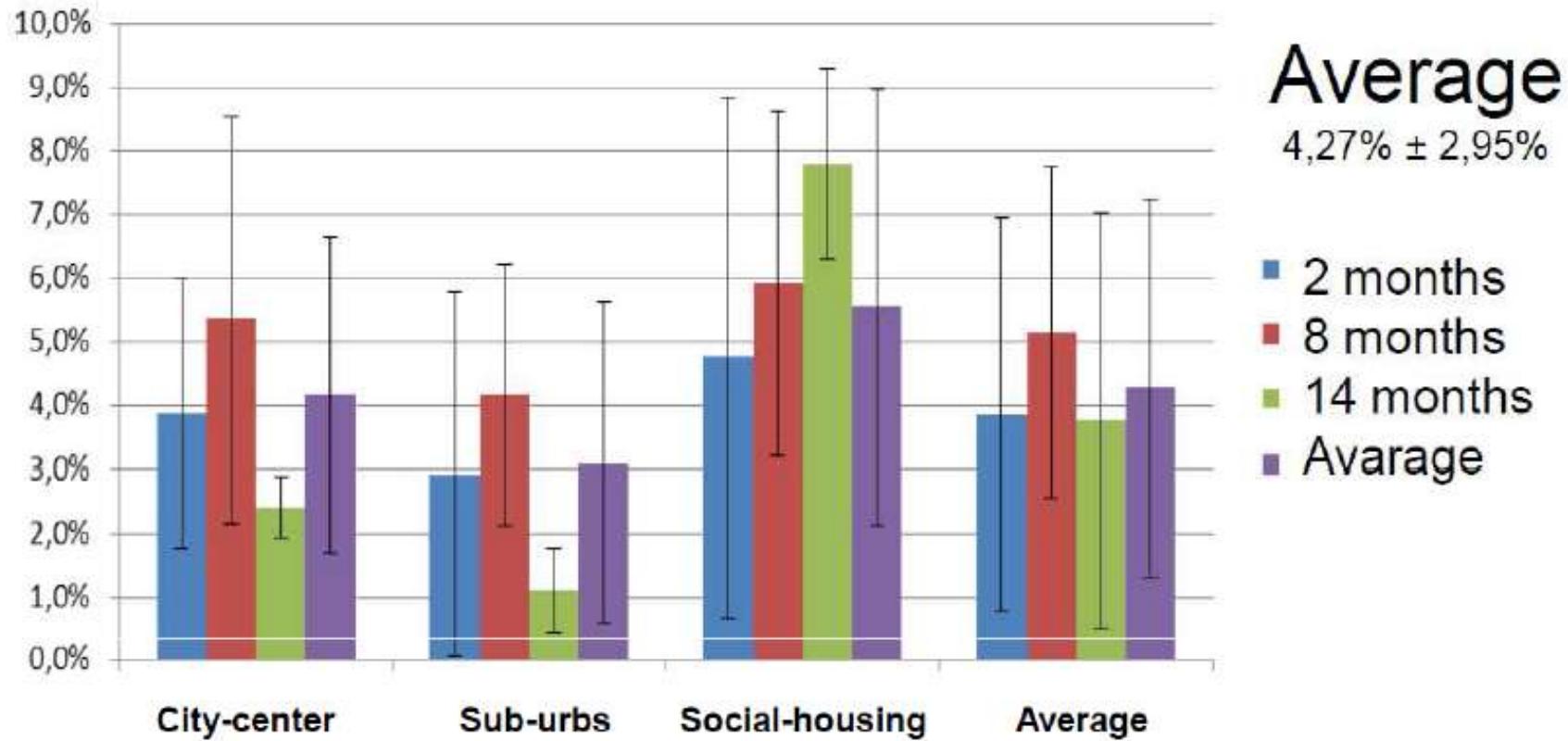
Over 6 families per bulding



10 lt. kitchen caddy and compostable bags

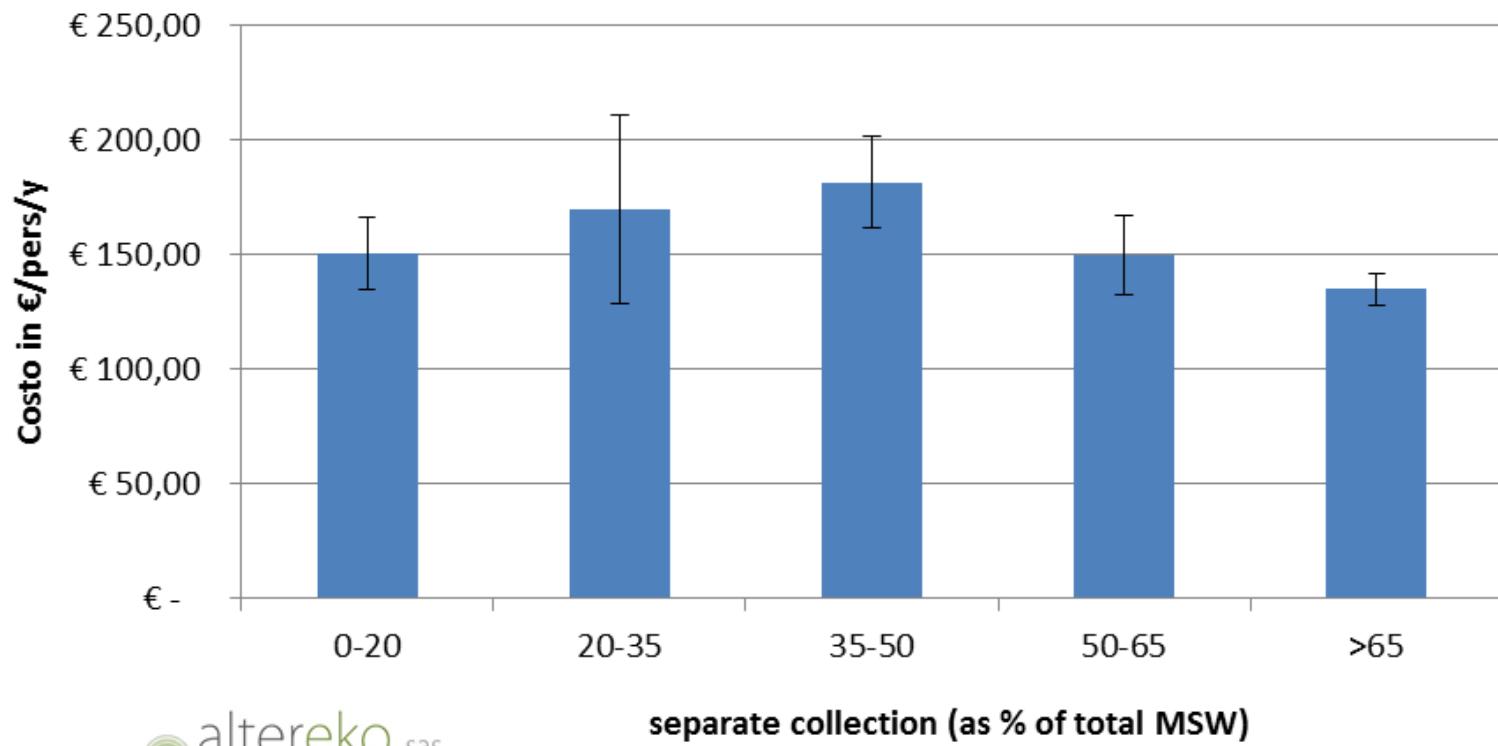
120/240 lt. wheely bin

Quality matters and can be achieved in any city: MILAN



Better performances means LOWER COSTS (€/inhab)

Total cost for MSW management in Italy - 2014



data evaluated by the Marco Ricci (Alteredko sas); 2015

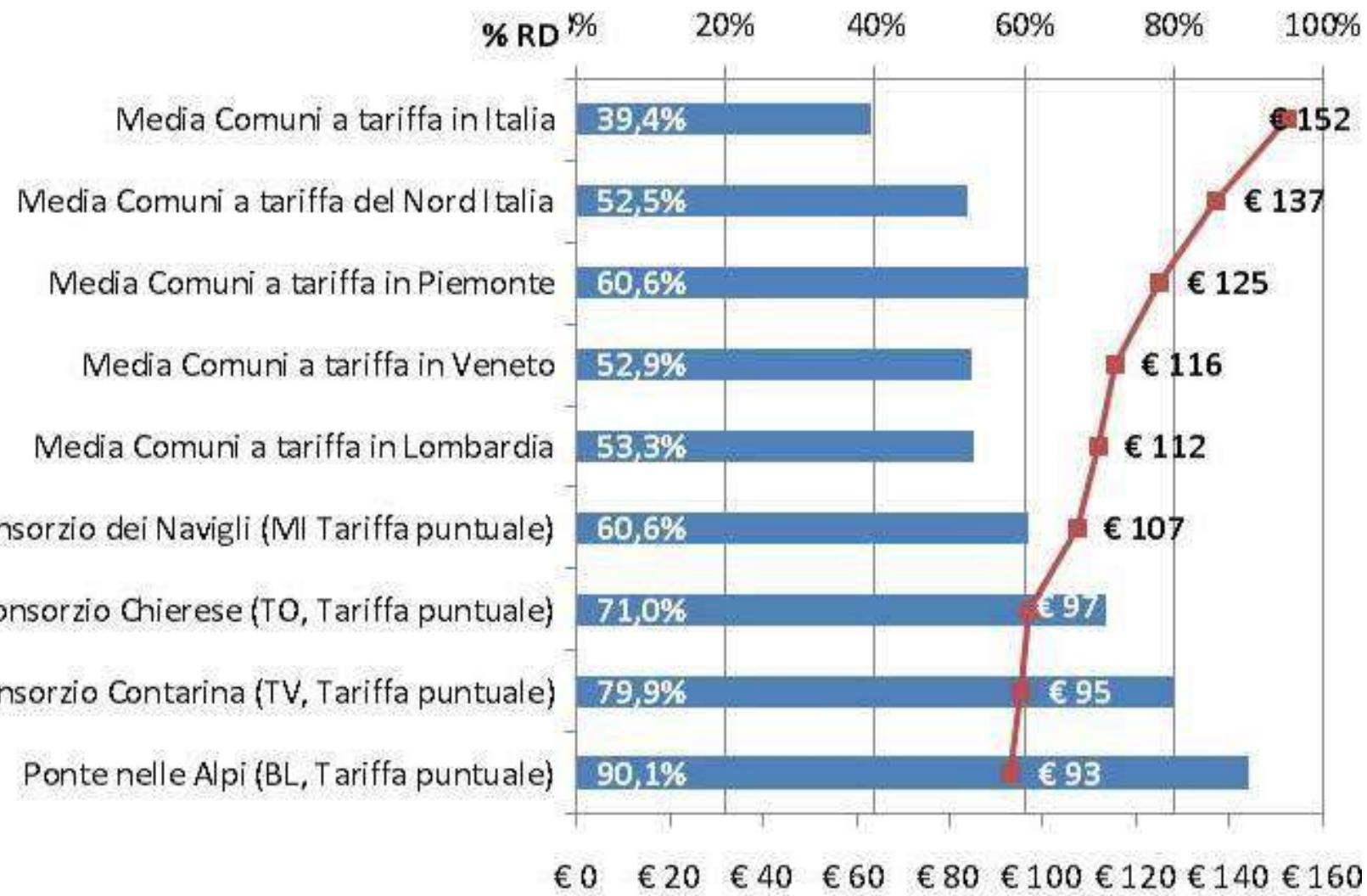
Total MSW management cost are lower for Municipalities with PAYT

Region	% sep coll rate TARI*	C tot TARI* (€/h*y)	% sep coll rate PAYT	C tot PAYT (€/h*y)
PIEMONTE	61,2	149,34	68,6	140,33
LOMBARDIA	63,9	134,53	64,8	129,99
TRENTINO A.A.	53,2	158,25	82,5	147,71
VENETO	49,5	109,33	71,1	86,87
FRIULI V.G.	72,8	110,42	80,3	94,33
EMILIA ROMAGNA	55,7	218,57	57,0	199,27

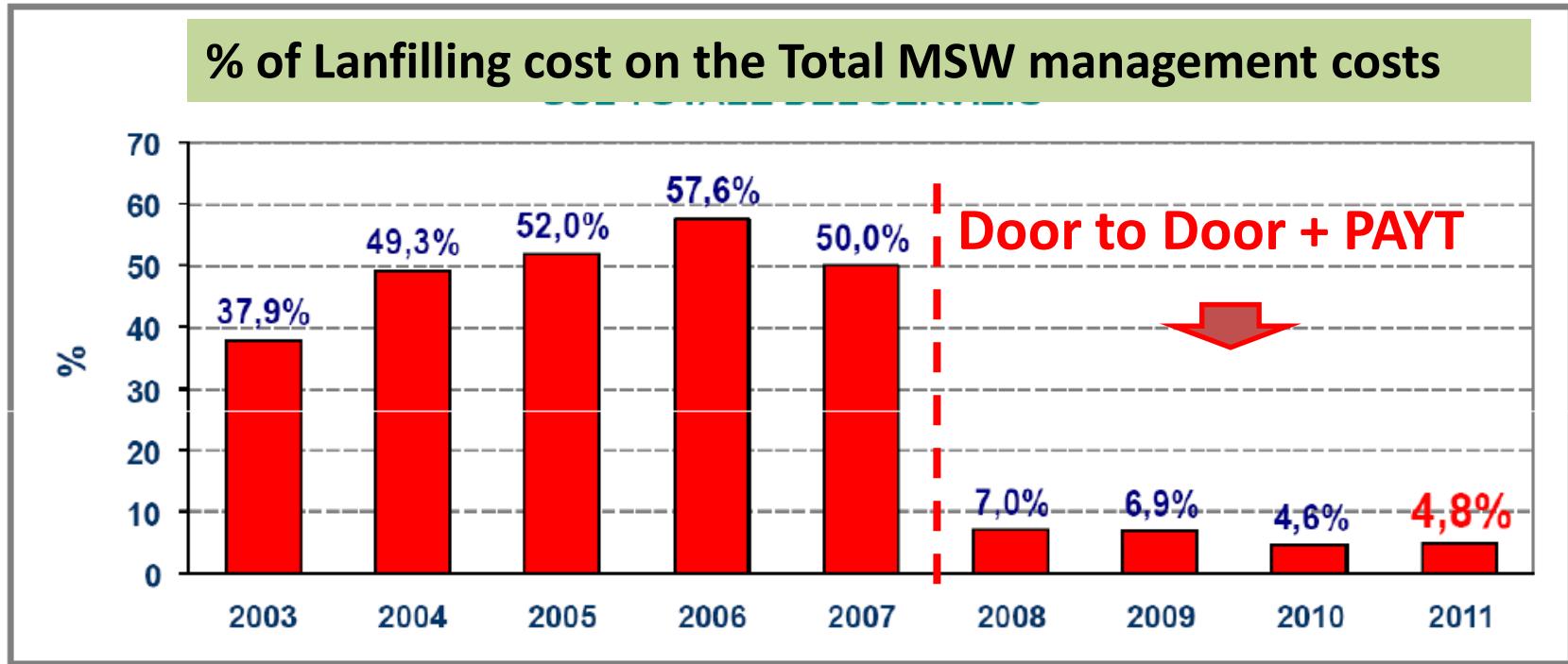
* Tari = **T**assa **R**ifiuti (Waste TAX)

Source: Italian Environ. Agency ISPRA, 2015

Total MSW management cost are lower for Municipalities with PAYT

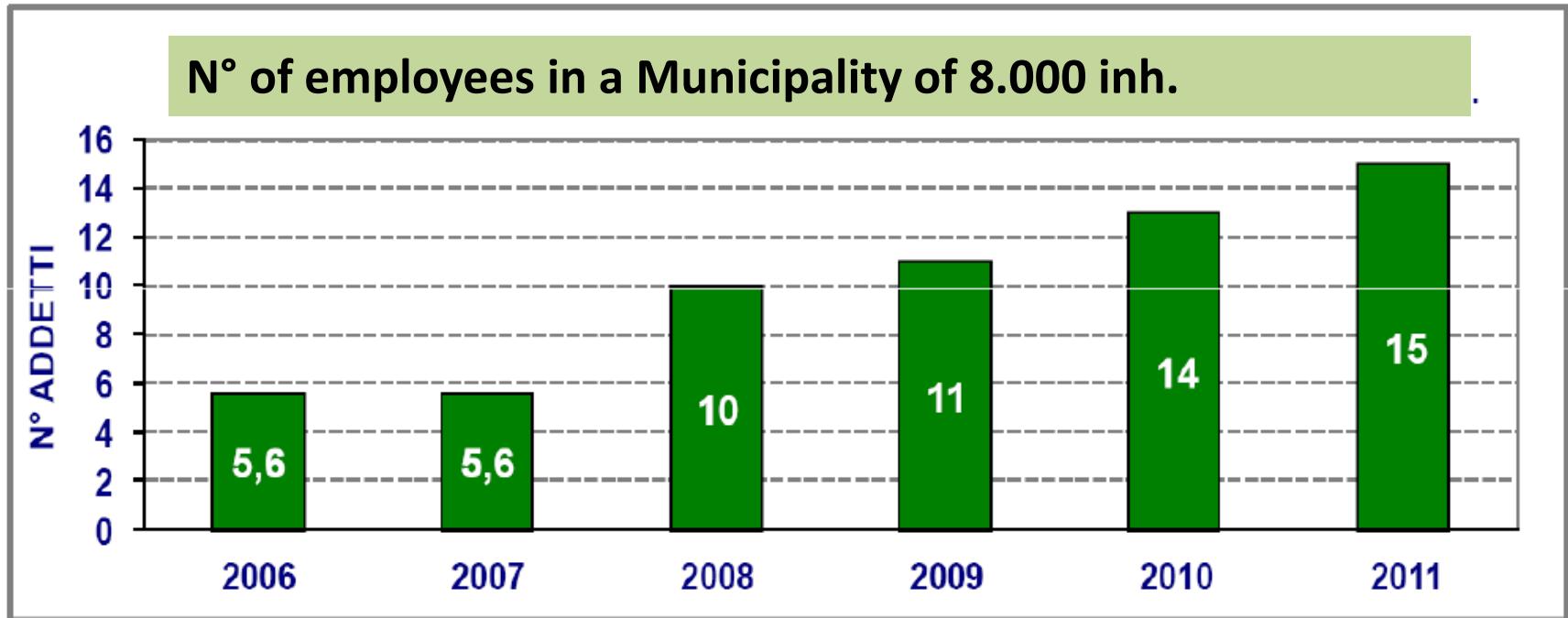


«Door to Door» model free municipalities from high landfill costs



Data from Municipality of Ponte nelle Alpi ITALY

«Door to Door» models provides more JOBS than street collection



Data from Municipality of Ponte nelle Alpi ITALY

PAYT can be implemented with different solutions (volume control):

Controlled acces devices



Sacchetti lasciati all'esterno dei cassonetti con apertura a banda magnetica.

Prepayed bags



Containers with identification devices (RFID)



Weighting systems failed due to:

- Low precision of on truck devices
- Absence of exposition reduction



PAYT can be implemented with different solutions (volume control):

Low Frequency is disappearing in the Italian market for waste detection equipment



	Low Frequency (LF)	Ultra High Frequency (UHF)
Frequency Range:	125kHz, 134.2kHz	865 – 928 MHz (Regionally dependent)
Typical Read Range of TSL products:	Up to 8cm for 32mm glass, up to 7cm for 50mm disc	Between 1.5m and 7.0m
Data transmission rate:	Slow data transmission rate	Fast data transmission rate
Multiple reads capability:	NO	Excellent multiple reads capability
Tag Cost:	Relatively expensive	UHF tags can be very low cost
Reader Cost:	Lower (more established technology)	Higher (newer and more complex technology)
Reader Antenna size:	Short range mobile LF readers require only a small antenna	Mobile UHF reader antennas are relatively large, reduced antenna sizes can be used if compromising on read range
Read field:	Small Read Field, but easier to define – ideal for reading unique items at close range	Read field is much larger than LF
Tag memory capacity:	Smaller memory sizes in comparison to passive HF/UHF RFID tags	Highr typically 96 bits to 1 Kbits
Security:	Low encryption capabilities	Read/write protection and anti-cloning, low encryption capabilities

RFID system (UHF)

Detachable labels for distribution



RFID microchip



Serial code printing on the body



Serial code example: **H0240R000023**

H = customer or municipality (HERA SpA)

0240 = capacity of the container (240 lt)

R = waste to be collected (Residual waste)

000023 = univocal serial number



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SUSTAINABLE ENVIRONMENTAL SOLUTIONS

 **ALTARES**
GREEN TECHNOLOGY

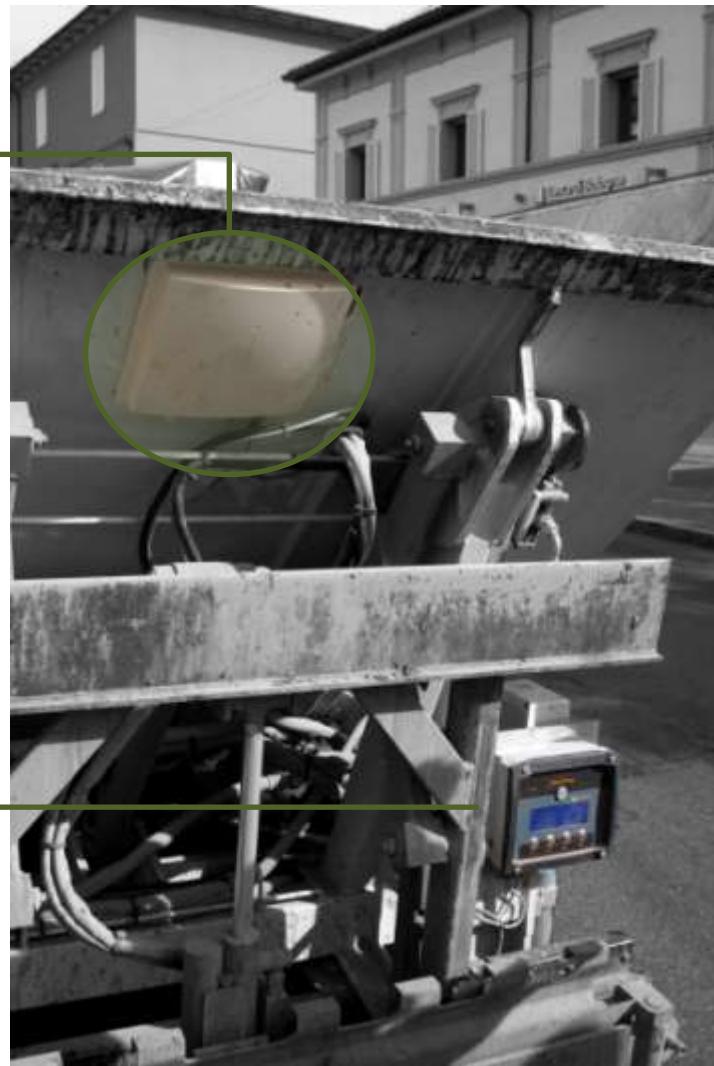
Distribution organization:



<https://www.youtube.com/watch?v=cIVwqHVMb8A>

On vehicle identification devices (UHF):

Microchip serial code are automatically detected during normal emptying operation. No extra work needed for the operator



Routing, collection points, stop points

DATA MANAGING

- Collection data are visible on real time on web using a laptop, tablet, smartphone etc. etc.
- Data can be easily exported to Excel file

Veicoli	Storico	Temi	Svuotamenti
Veicolo	Tutti i veicoli		
Tag ID	tutti		
Svuotamenti	Personalizzato		
Dal	21/12/2012	00.00	
al	21/12/2012	23.59	
<input type="button" value="Cerca"/>			

Data research interface



Codice/Descrizione	N°
E0040P005270	21/12/2012 07.36
Strada San Pietro - San... (102)EK 910 ZL PRES	
E0040S000103	21/12/2012 08.10
Strada Provinciale Elpidi... (101)EK 958 ZL - PRES..	
E0040S000137	21/12/2012 07.49
Via Ippolito Nievo - San.. (110)EK 958 ZL - PRES..	
E0040S000144	21/12/2012 06.38
Via Maria Gioia - Sant'El.. (110)EK 958 ZL - PRES..	

Serial code **E0040P005270**
E = ECOELPIDIENSE SpA
0040 = 40 lt bucket
P = Plastic collection
005270 = serial number

Microchip serial code, truck n° plate, address, hour etc.
etc.



GOOGLE Streetview connection

CASE HISTORY 1 – Tiana (Catalunia)

First “Door to door” collection in Spain since year 2000 with some growing issues:

- Increase of not compostable in foodwaste container
- Misuse of centralized container for vertical buildings
- Manual control of non conformity with loss of time by the municipality



In 2013 a survey showed that 72% of the citizens were positive regarding a “pay as you throw” scheme introduction.

Departement of Barcelona

Population: 8.310 inhabitants

Area: 7,9 kmq.

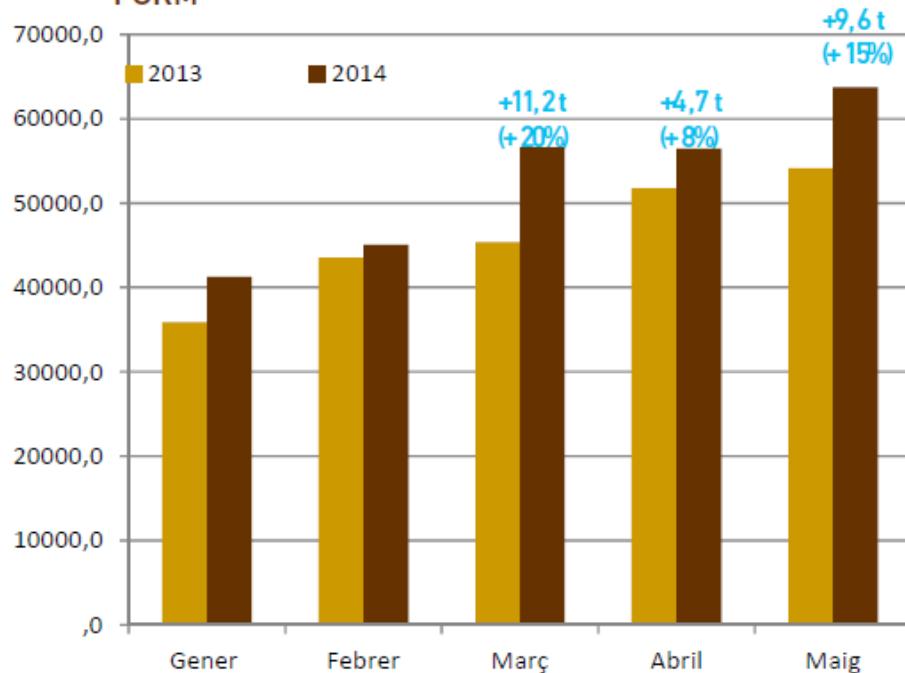
Over 75% of separate collection rate



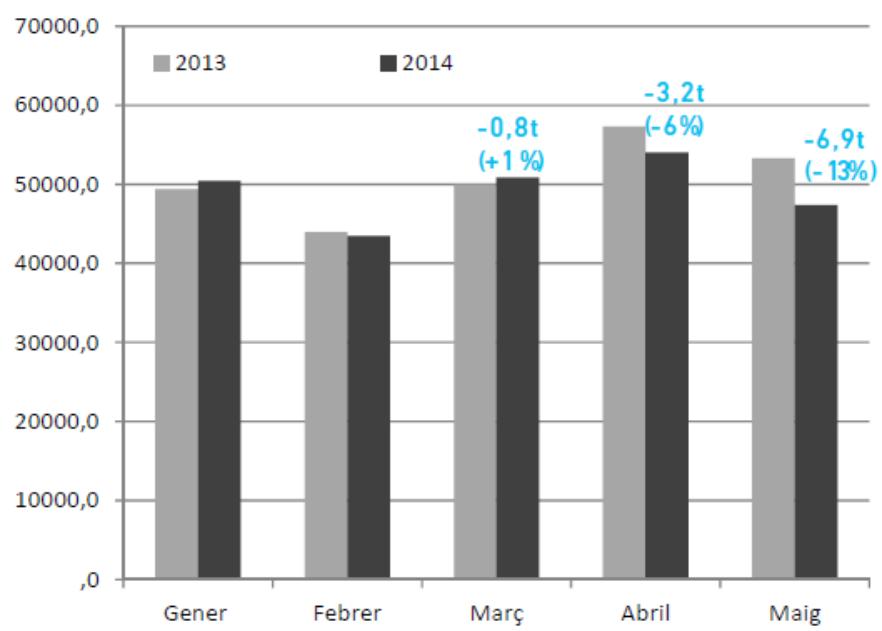
CASE HISTORY 1 – Tiana (Catalunia)



FORM



RESTA



CASE HISTORY 2 – Parma Municipality (Italy)

Inhabitants ~
190.000



2012



By 2016

- **48% separate collection rate**
 - **Only 1/3 of HH served by “door to door” service**
 - **High cost for residual waste treatment (incineration) € 9.000.000**
 - **Low income from recyclables € 580.000**
-
- **80% separate collection rate**
 - **100% of HH served “door to door” service**
 - **PAYT introduction**
 - **Effective communication and waste reduction campaign**

The funeral of the last “CASSONETTO” - side loading container



<https://www.youtube.com/watch?v=2nBHMLlaRY4>

Economical results of “door to door” implementation:

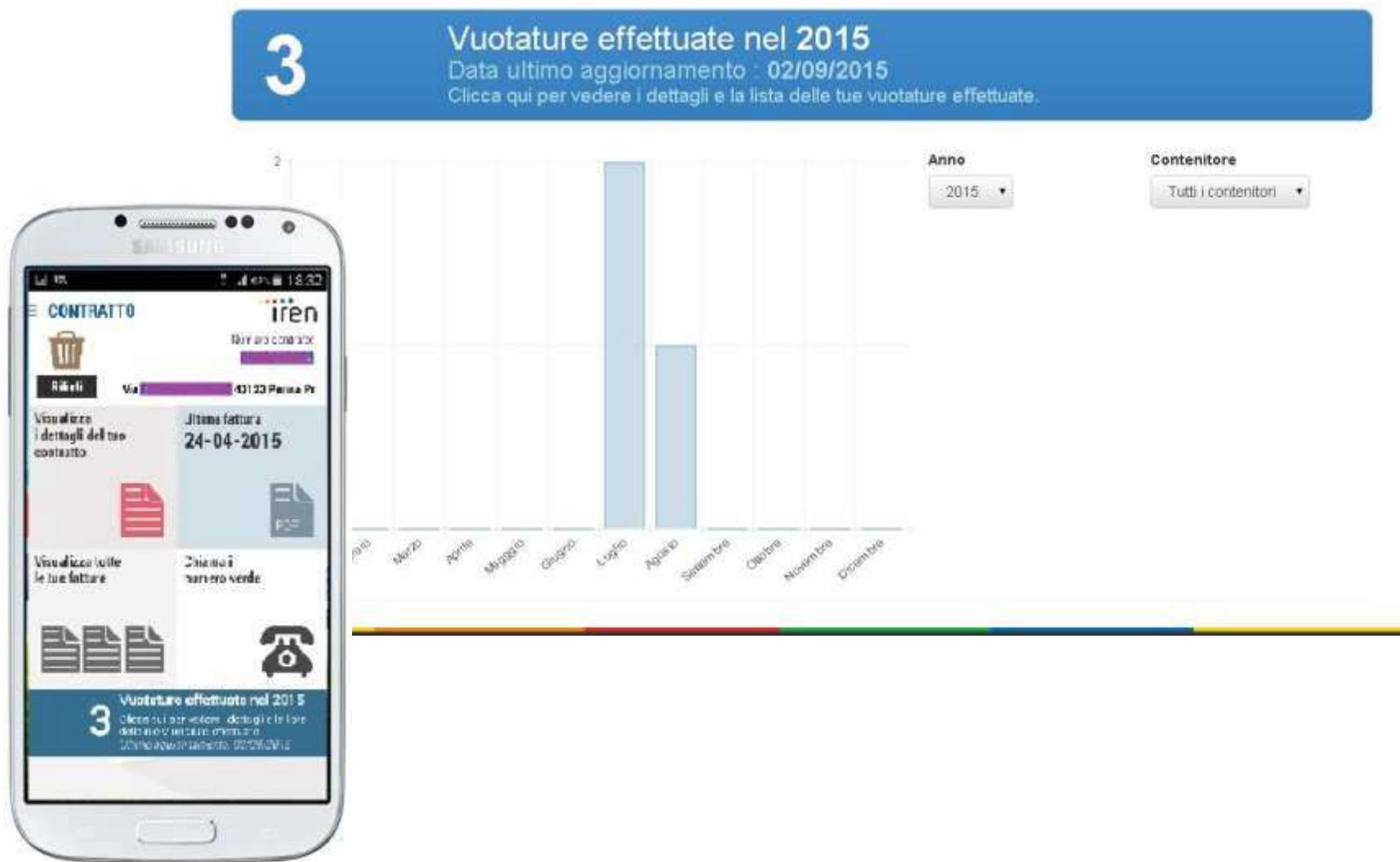
	2013	2014	Delta
Raccolta e trasporto RSU	5.300.099	6.868.191	1.568.092
Trattamento e smaltimento RSU	9.050.214	5.563.844	- 3.486.370
Raccolta differenziata	14.063.648	15.049.744	986.096
Trattamento e riciclo RD	1.957.782	2.752.128	794.346
Detrazione per ricavi Conai	- 805.295	- 1.340.000	- 534.705
Spazzamento e servizi collaterali	5.908.646	6.127.451	218.805
Totale	35.475.094	35.021.358	- 453.736

STANDARD Fee vs PAYT

Example: 3 people 100 mq



CASE HISTORY 2 – smart phone and Web based platform



CASE HISTORY 3 – CONTARINA Spa (Italy)

CONTARINA 100% Public Company

Square Kms	1.300
Municipalities	50
Inhabitants	~ 554.000
Users	~260.000
Employees	686
Annual turnover 2014	~ 84 M. €



Historical centers



Urban centers



Outlying areas



Remote areas



<https://www.youtube.com/watch?v=aAe3SLtksI8>

Collection frequency

Bins and tools

REGULARITY OF COLLECTION	COMPLEX URBAN AREAS historical centers and highly populated areas		STANDARD Medium and low populated areas
S RESIDUAL	2 /week	1 /week	1/2week
U ORGANIC	3 /week	3 /week	2 /week

STANDARD
(lower populated areas)

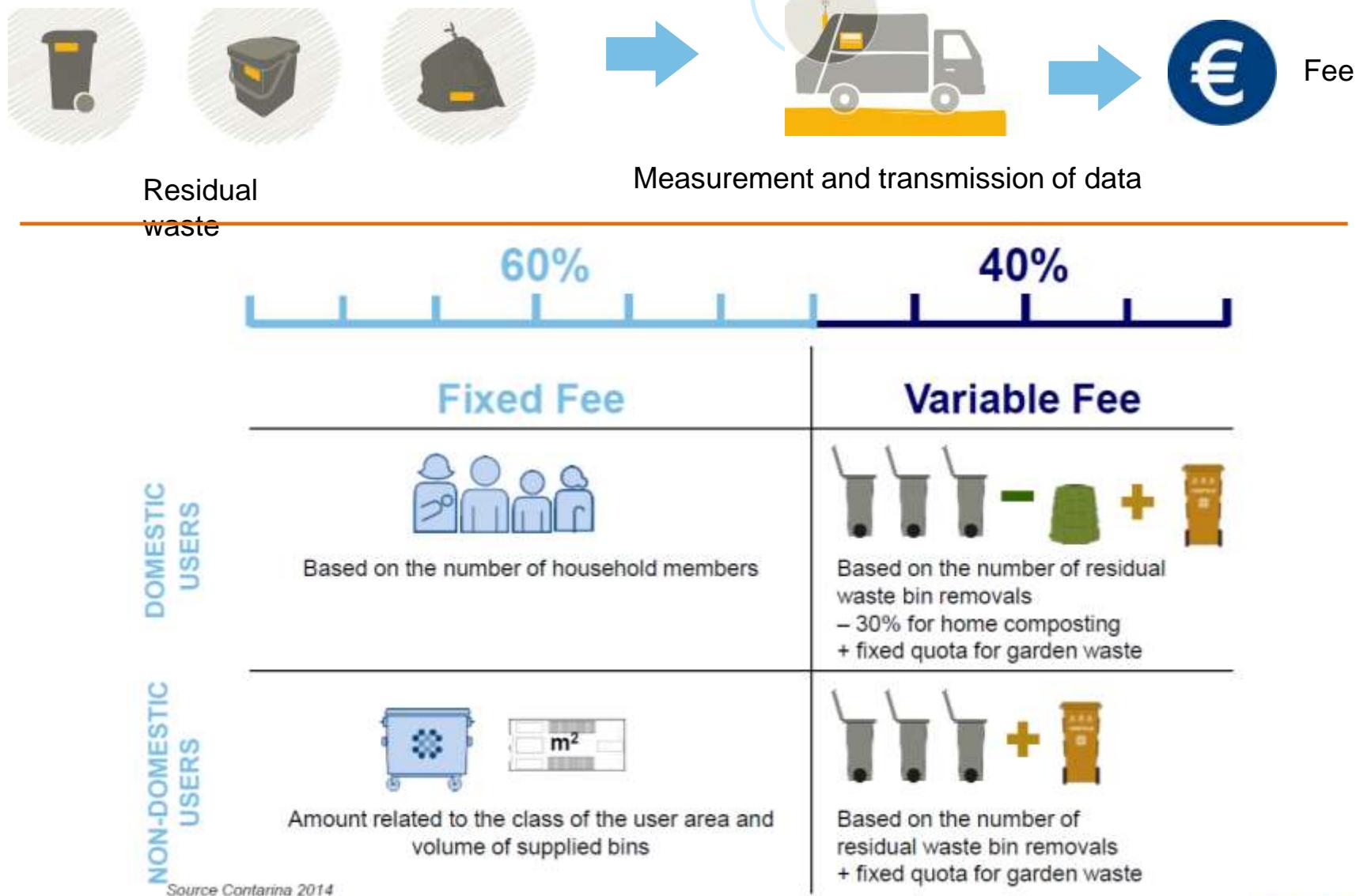


**COMPLEX
URBAN AREAS**
(historical centers
and highly populated areas)

Small bins
and bags
reserved for
users with
limited space.



PAYT charge composition.



Source Contarina 2014



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Results in the municipalities managed by Contarina

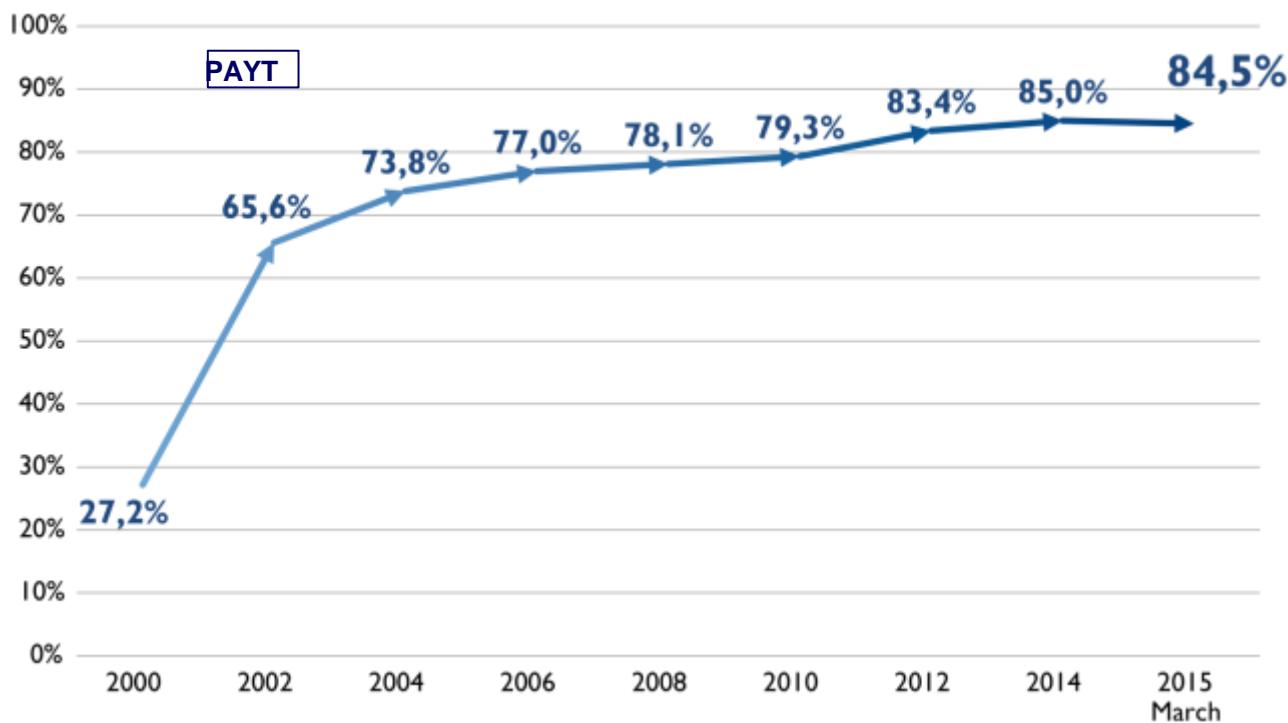


321 kg/inh.*yr



55 kg/inh.*yr

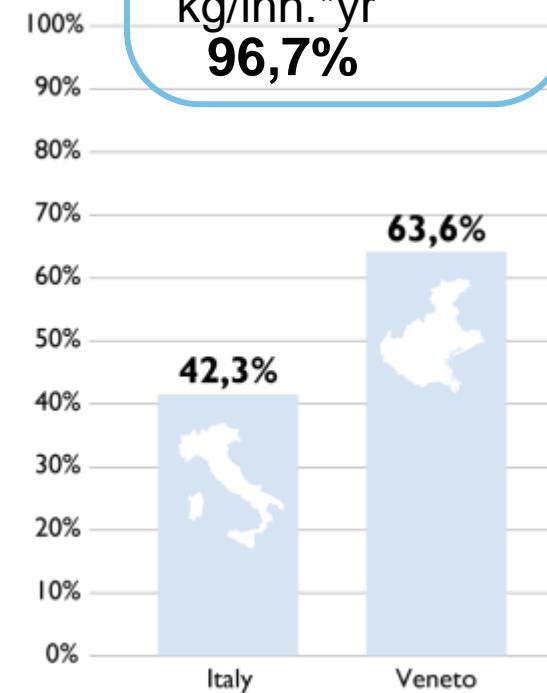
PAYT



by
2022

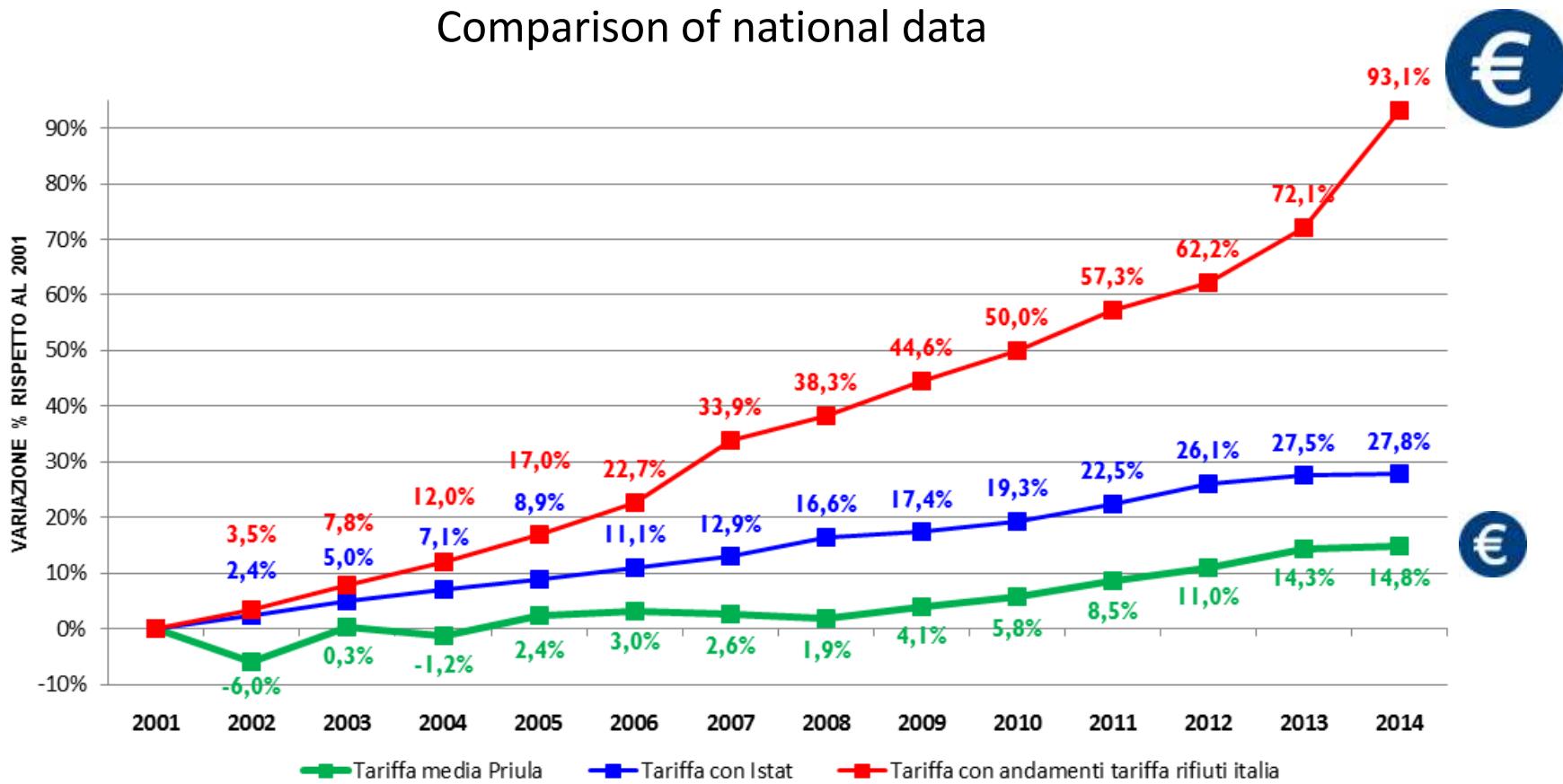


10
kg/inh.*yr
96,7%



The average household's fee

Comparison of national data



SOURCE

dati Contarina 2014, dati Istat 2014

* Cost of living

THANK YOU FOR YOUR ATTENTION

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