

Waste4Think: tools to reach 80% separate collection in Seveso, IT

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ARS Ambiente, Italy



About myself



- Consultancy on integrated waste management



- Italian Composting Association



- Coordinator of the italian pilot of Seveso

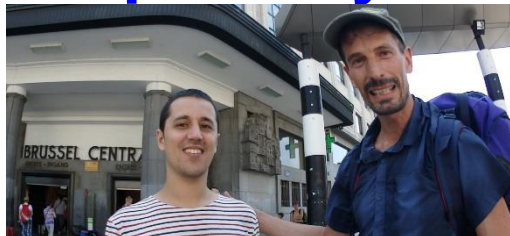


- European Compost Network, ISWA



#InterrailRecycling

<http://bit.ly/interrailrecycling>



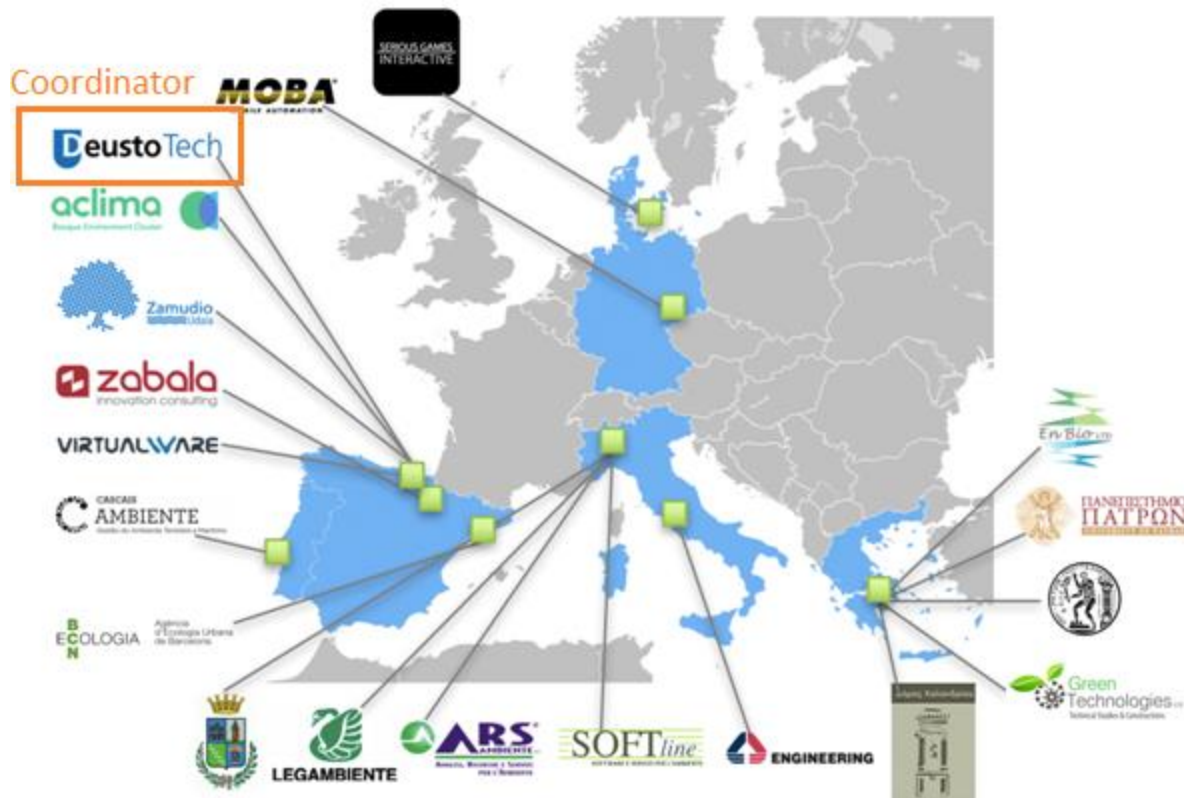
Waste4Think: the Consortium

➤ 7 European countries

- Spain (6)
- Greece (5)
- Italy (5)
- Germany (1)
- Denmark (1)
- Portugal (1)

➤ 19 partners

- 5 public administrations
- 1 research centre
- 2 universities
- 9 companies
- 1 industrial cluster
- 1 NGO



Waste4Think - Main objective

The main objective of Waste4Think is **to improve the current waste management practices** validating and integrating **20 eco-innovative solutions** that cover all the waste value chain.

The benefits of these solutions will be enhanced by a **holistic waste data management methodology**, and will be demonstrated in **4 complementary urban areas in Europe**



➤ 4 Pilot areas

- Cascais (C); Portugal
- Zamudio (Z): Spain
- Seveso (S): Italy
- Halandri (H): Greece

The eco-solutions

Waste4Think demonstrates and validates 20 technological and non-technological solutions that include:

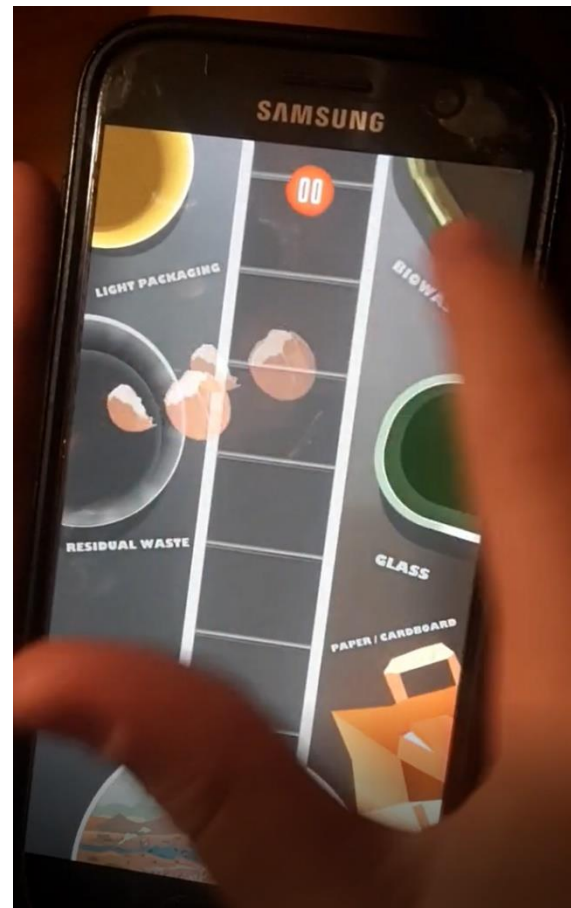
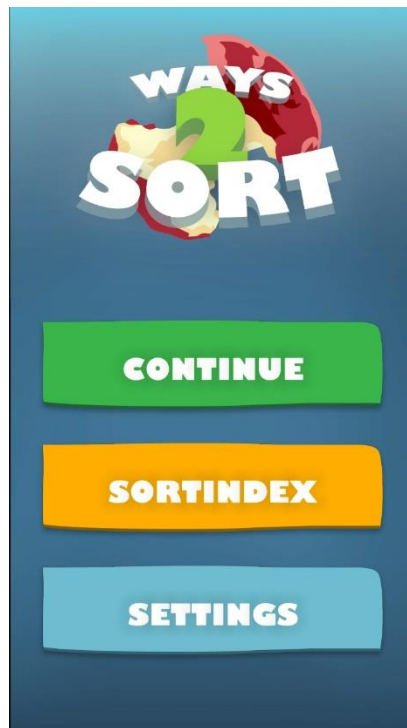


- **ICT tools** to support daily operation and long-term planning
- **APPs** for citizen empowerment and engagement
- **Educational materials** based on innovative teaching units and serious games
- Tools for **citizen science** for the co-creation of novel solutions
- Mechanisms to **boost behavioural changes** based on **economic instruments** and **social actions**
- Decentralized solutions for valorisation and reuse of high value resources (**biowaste and nappies**)

e.g. Apps and «Serious Games»: Ways2Sort



From today
on Google
Play Store



4 Pilot Cities

Zamudio (Spain, 3200 inhabitants)

PAYT with road containers: user identification and locks / chambers

Participative process, app and learning materials

Baseline (separate collection):

18%

Target: 50-60%



Halandri (Greece, 70000 inh.)

No PAYT. Introduction of food waste (FW) collection. Pilot plants for drying FW to test alternative uses. Co-digestion of FW and nappies

Baseline (separate collection): 11%

Target : 30%



Seveso (Italy, 22000 inh.)

PAYT with door to door collection and RFID bag. Social actions and eco-Events

Baseline (separate collection): 70%
Target : 80%



Cascais (Portugal, 206479 inh.)

"Collective" PAYT with "gamification" scheme and underground containers: Pilot area 3000 inh. Voluntary identification in Smart bins and eco-bonuses

Baseline (separate collection): 30%
Target : 40-50%



ANALISI, RICERCHE E SERVIZI
PER L'AMBIENTE

A focus: test new collection schemes including Pay As You Throw



Zamudio (ES): locked road containers and PAYT



Seveso (IT): door to door bags with RFID and PAYT



Cascais (PT): underground containers with gamification



THE ITALIAN SCHEME WITH INTENSIVE DOOR TO DOOR COLLECTION



Separate collection scheme: door to door



Door to door – key features:

- Convenience (proximity)
- Visibility
- Optimization of frequencies
- Optimization of vehicles



	Ischitella Municipality	Separate Waste Collection Calendar Domestic Users	
MONDAY		ORGANIC WASTE Brown Bin FOOD WASTE, PLASTIC AND RECYCLABLE SCRAP, COFFEE GRINDING, PESTICIDES, ETC.	 
TUESDAY		PAPER, CARDBOARD Blue Bin GLASS Green Bin	 
WEDNESDAY		NOT RECYCLABLE Grey Bin FUEL, CEMENT AND DERIVATIVES, CONCRETE, LIGHT GUANETTE, RUBB, TILES, CEMENT, CEMENT, BRICKS, BRICKS, ETC.	
THURSDAY		ORGANIC WASTE Brown Bin FOOD WASTE, PLASTIC AND RECYCLABLE SCRAP, COFFEE GRINDING, PESTICIDES, ETC.	 
FRIDAY		PLASTIC, METAL Yellow Bin PLASTIC BOTTLES, BOTTLES, BOTTLES, PLATES AND PLASTIC CUPS, WHITE METAL AND ALUMINUM IN CONTAINERS AND BOTTLES, ETC.	
SATURDAY		ORGANIC WASTE Brown Bin FOOD WASTE, PLASTIC AND RECYCLABLE SCRAP, COFFEE GRINDING, PESTICIDES, ETC.	 
ON CALL		BULKY WASTE, WEEE, MOWING Home to home FREE RESIDUAL WASTE AND BULKY COLLECTION IS AVAILABLE. FOR RESIDENTS WHO DO NOT HAVE A SEPARATE COLLECTION, IT IS ONLY THE GREEN NUMBER FOR THE 411 (FROM LANDLINE) OR 0112 (FROM MOBILE).	
 GREEN NUMBER 800 410 472		Deposit the equipment outside of your home by 5 a.m. on the day indicated.	

Both in densely populated areas... (Milan)



...and rural / disperse areas. E.g. Pantelleria

- 65% separate collection
- Best performer in Sicily



Source: Sartori

Optimization tools for rural areas

Light trucks with 2-compartment tank for the collection of food waste and residual waste at the same time



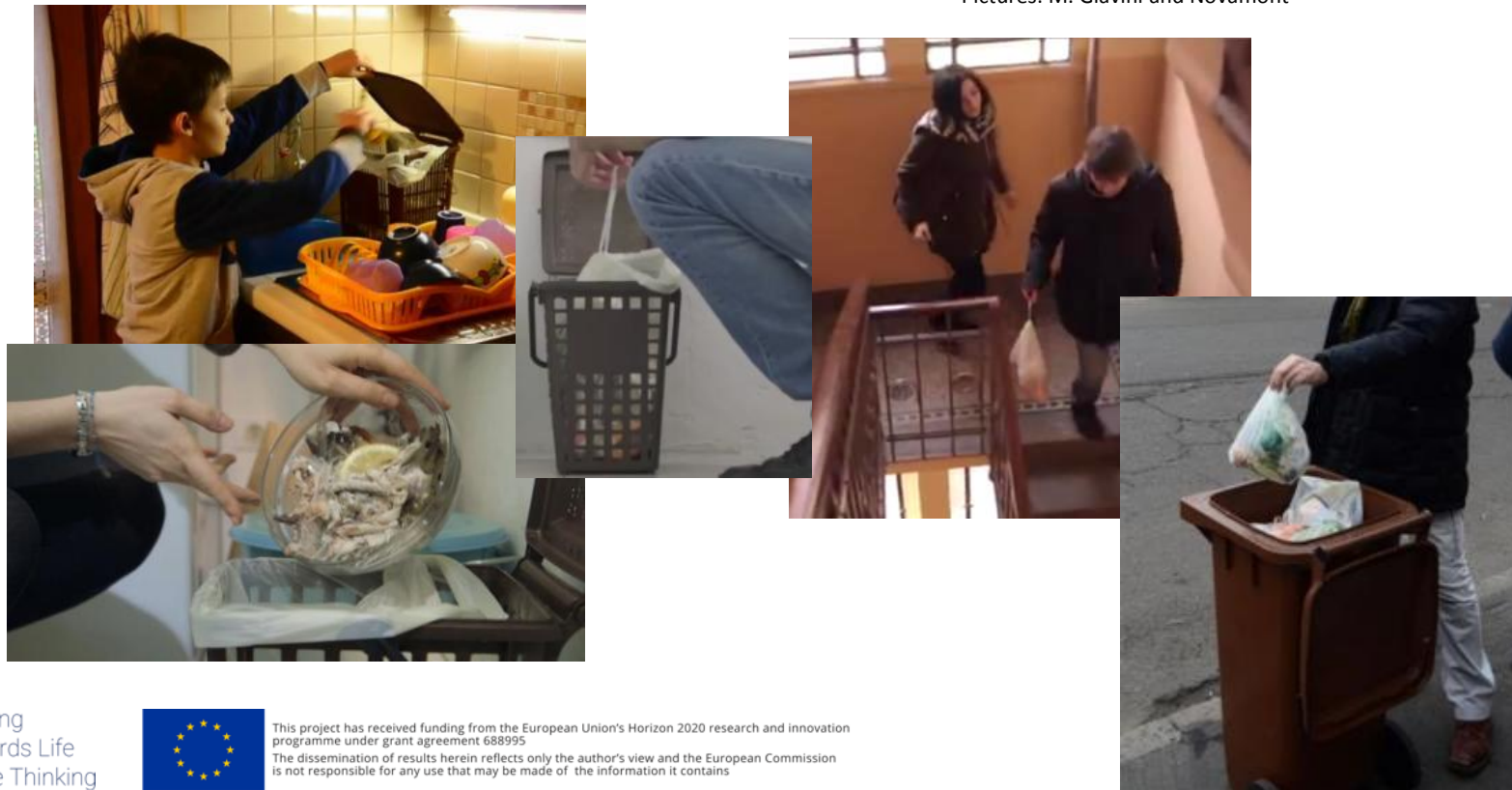
Optimize transportation with low cost transfer stations



Contarina
(IT)

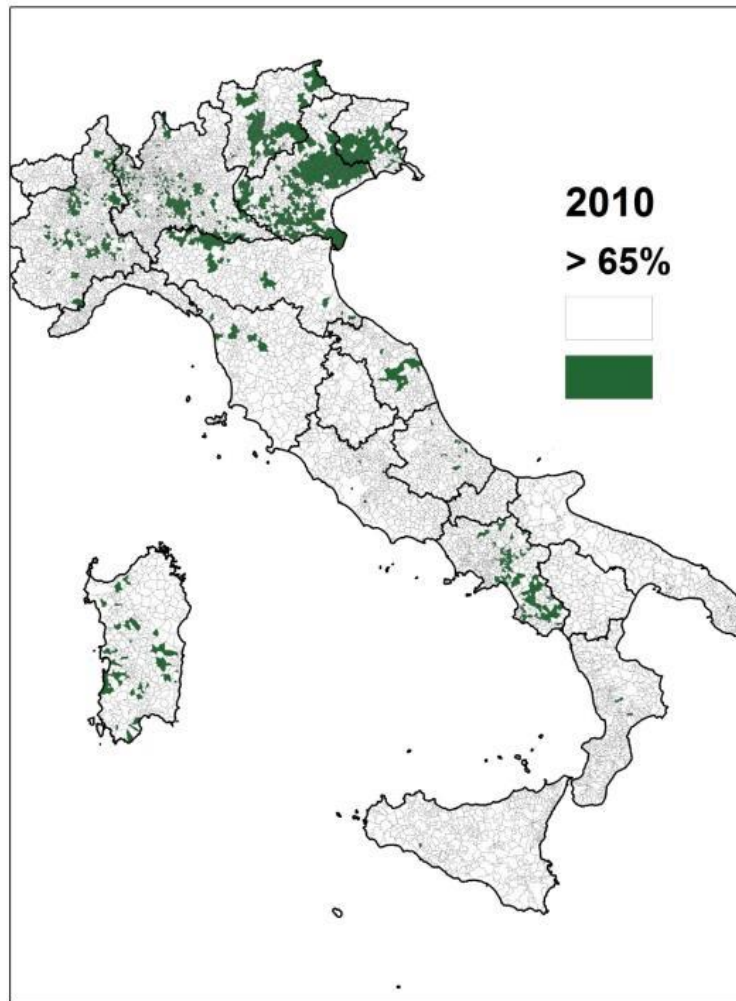
Food waste as key fraction: the easiest path from the kitchen to the bin

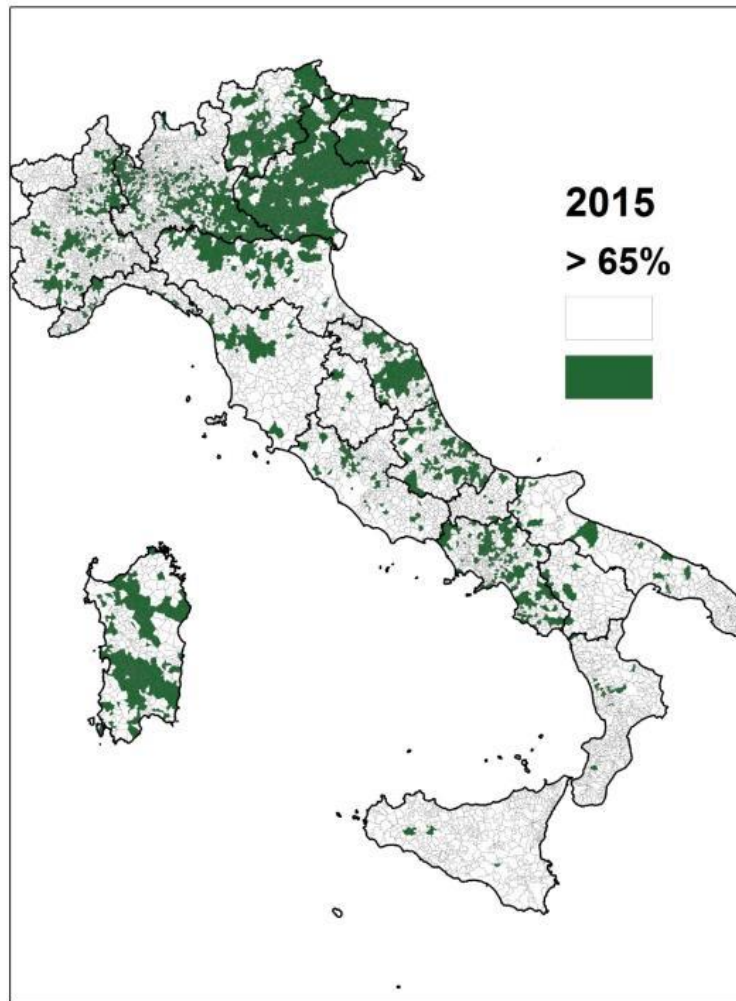
Pictures: M. Giavini and Novamont



Frontrunners and replication effect



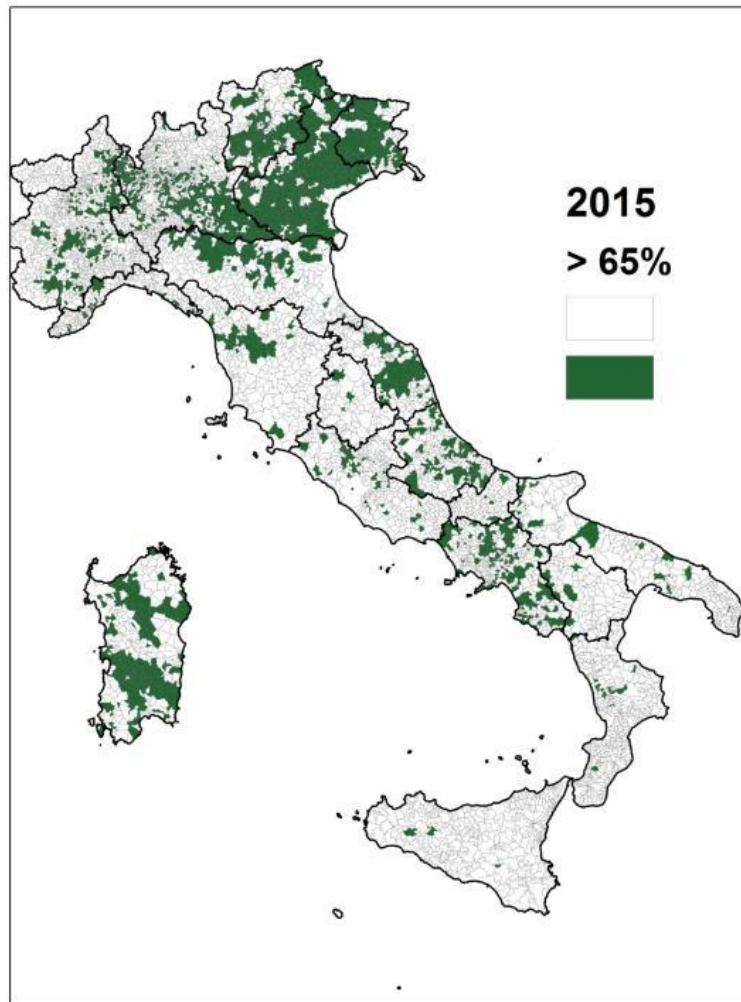




At least one best practice
in each Region!

-> High recycling (with
biowaste collection) is
possible **everywhere**

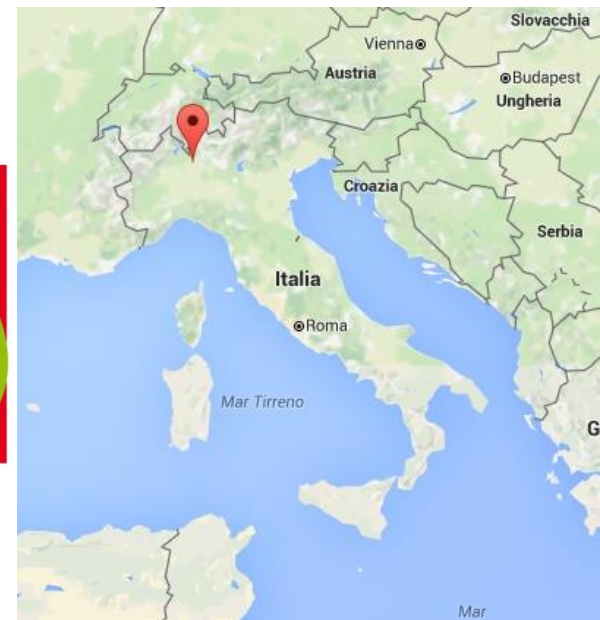
Rely on and support the
frontrunners





SEVESO

Seveso: from an environmental disaster to environmental consciousness



Waste4think: an integrated set of actions to reach the «theoretical maximum» separate collection



PAYT

Funny door to door sensitization

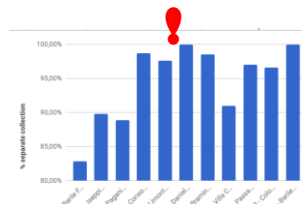
Ecoevents

Virtuous households contest

Reusable nappies



98% recycling



WASTE 4think

Moving towards Life Cycle Thinking



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 688995. The dissemination of results herein reflects only the author's view and the European Commission is not responsible for any use that may be made of the information it contains.

ARS AMBIENTE
ANALISI, RICERCHE E SERVIZI PER L'AMBIENTE

SEVESO

Social actions





with REID bags

The image is a composite of two photographs. The left photograph is a close-up of a blue Tesco Sainsbury credit card. The card features the Tesco logo, the text 'TESCO SAINSBURY', a gold chip, and the cardholder's name 'CLIVE WATKINS'. It also displays the card number '0000 0000 0000 0000', the expiry date '06/12/2012', and the name 'CLIVE WATKINS'. The right photograph shows a man in a dark blue t-shirt and glasses using a card skimmer attached to a self-checkout machine. The machine has a screen and a keypad. A red circle highlights the card skimmer. The machine has a sign that says 'at 24'.

€ 2.30 / bag

4



	COMUNE SEVERO Viale Vittorio Veneto, 3/5 - 28022 Severo (NO) C.A. 0167/030004 - C. Reale - 016/6078556 Tel. 032/ 51271 - Fax 032/ 5090513	Codice Cliente Codice Documento	00000000000000000000 00000000000000000000
	Documento: AVVISO DI PAGAMENTO PROVVISORIO N. WT43 del 31/01/18 CONGUAGLIO NON DOMESTICHE TARI 2017 + ECCEDEXE Modalità di pagamento: BP 2 RATE + RATA LINCEA Intestatario: MARCO ROSSI - VIA ROMA 1 - 28022 SEVERO MB - C.F. XXXXXXXXX02XXXXX		
	DETTAGLIO TARI COMUNE DI SEVERO		

Account 2017																			
Utilezza non domestica id utenza: 2270770 MARCO ROSSI - VIA ROMA 1 - Cte 18 ATTIVITA' ARTIGIANALI TIPO BOTTIGLIE: FALEGNAM. IDRAULICO, FAREBBELETR																			
	Periodo	Pratica unitaria																	
UTILEZZA	01/01/17-31/12/17	350 MQ 95	1.00071																
QUOTA FISSA			55.54 0,30																
QUOTA VARIABILE	01/01/17-31/12/17	350 MQ 95	0.79768																
			75.79 0,40																
Totale 2017			€ 171,32																
Altri importi			€ 171,32																
<table border="0"> <tr> <td></td> <td>Periodo</td> <td>Pratica unitaria</td> <td></td> </tr> <tr> <td>UTILEZZA 2270770 - ECCEDEXE PRODUZIONE LITRI EFFETTIVI 8 x 110 = 660</td> <td>01/01/17-31/12/17</td> <td>0,25000</td> <td>0,15 0,30</td> </tr> <tr> <td>LITRI COMPRESI IN QUOTA VARIABILE: 360,00</td> <td></td> <td></td> <td></td> </tr> <tr> <td>APPORTO ATTUALE ATTUALE</td> <td></td> <td>N 1</td> <td>-0,35000 -0,35 0,00</td> </tr> </table>					Periodo	Pratica unitaria		UTILEZZA 2270770 - ECCEDEXE PRODUZIONE LITRI EFFETTIVI 8 x 110 = 660	01/01/17-31/12/17	0,25000	0,15 0,30	LITRI COMPRESI IN QUOTA VARIABILE: 360,00				APPORTO ATTUALE ATTUALE		N 1	-0,35000 -0,35 0,00
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LITRI COMPRESI IN QUOTA VARIABILE: 360,00																			
APPORTO ATTUALE ATTUALE		N 1	-0,35000 -0,35 0,00																
Riepilogo																			
3044 - TARI			177,12																
3044 - TRIBUTI PROVINCIALE			0,00																
TOTALE DOCUMENTO			177,12																
NETTO DA PAGARE			186,00																



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SEVESO: PAYT results

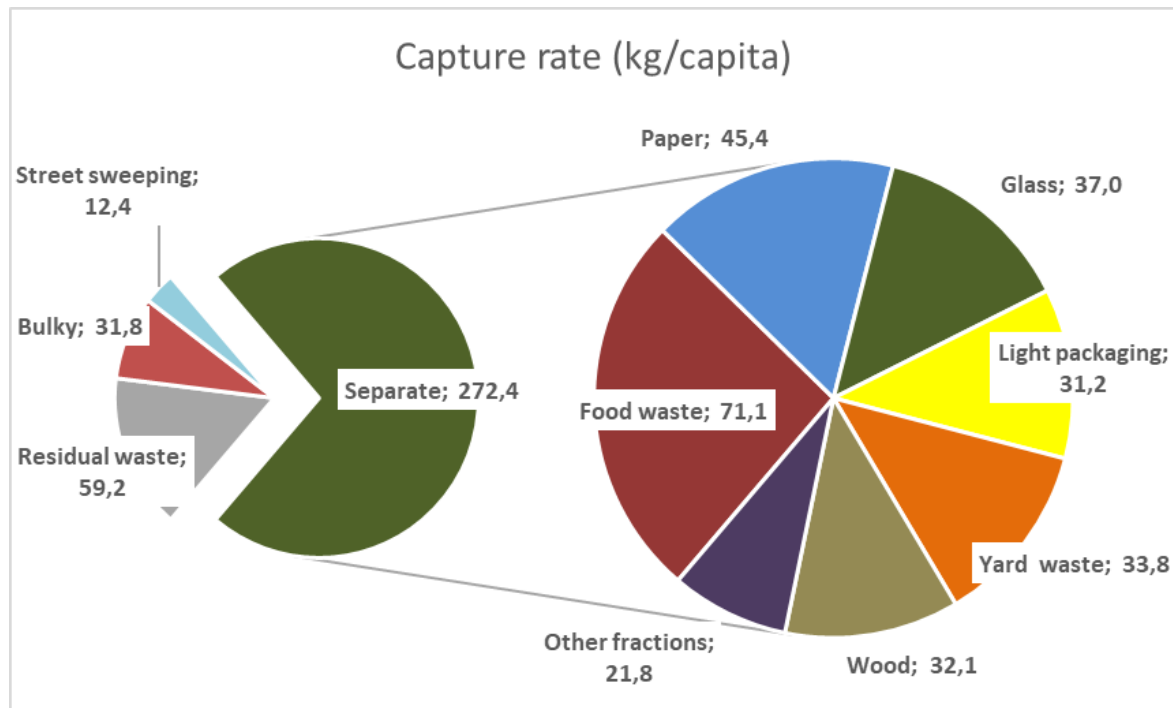
- The average set out of residual waste bags has been **< 1 bag per month**

- The average variable part of the tax has been **€20 – 25 / year (5-7% of the total tax)**

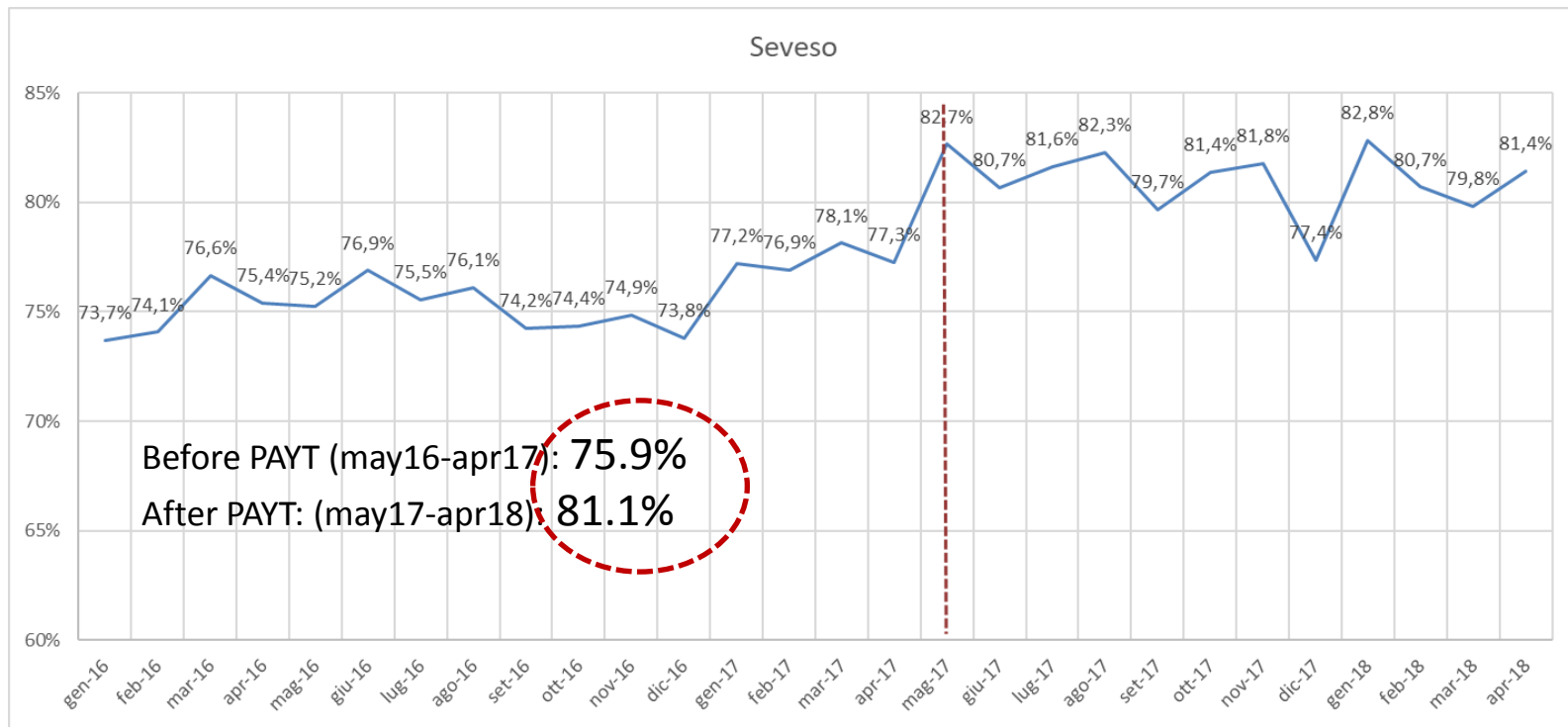
Member s of the family	Bags / year	Average amount of the variable part	% of the total tax
1	3,7	€ 8,40	7,1%
2	6,9	€ 15,83	8,7%
3	8,8	€ 20,13	9,8%
4	10,5	€ 24,14	9,6%
5	11,2	€ 25,86	9,0%
6	13,6	€ 31,35	27,9%

Separate collection: results (Seveso, 2018)

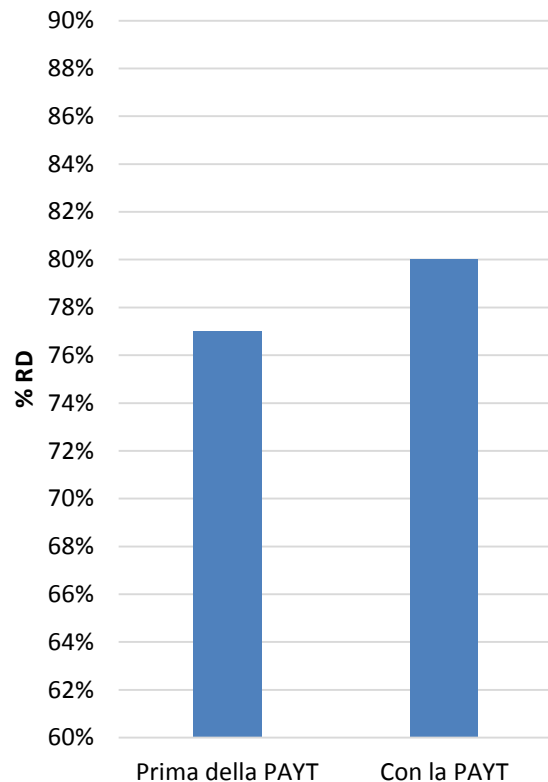
- **73% separate collection**
 - (+ bulky waste and street sweeping recycled: ~80%)
- Limited residual waste (59.2 kg/ca)
 - WEEE: 6.4 kg/capita



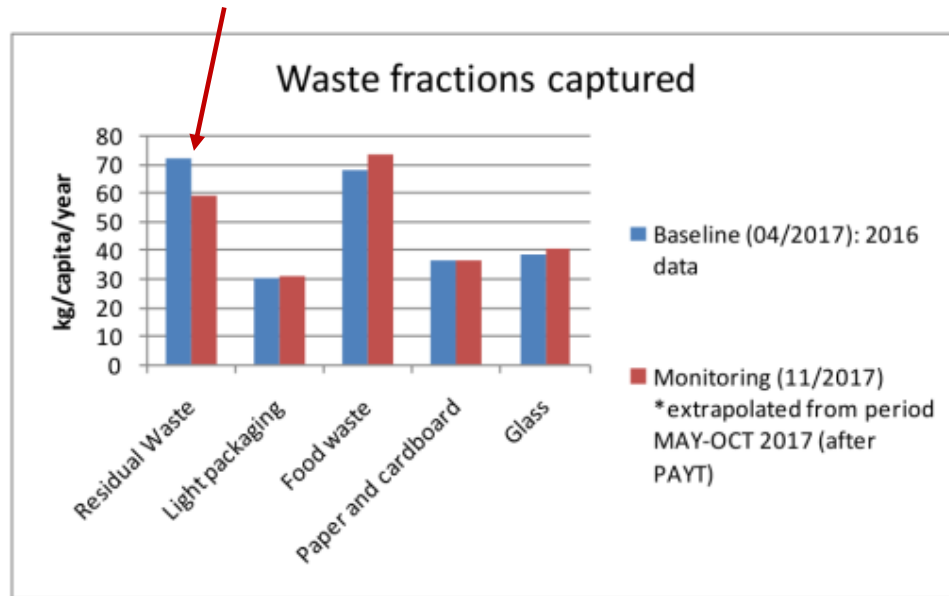
PAYT effect – separate collection



PAYT results



Residual waste
decreased from 72 to 58
kg/capita.year



New waste characterizations



Mt
Monitoring & Testing srl
via Martiri della Libertà, 5/B - 24010 Sorisole BG -
T. ++39 035 4128352 - Fx. ++39 035 574033
www.mt-international.org & www.analisesistemicologiche.it
e-mail: industrial@mt-international.org

Accreditamento CERTIFICATO
SGS UNI EN ISO 9001:2015 Cert. 204
SGS BS OHSAS 18001:2007 Cert. 032
SGS UNI EN ISO 14001:2004 Cert. 8004

SOCIETÀ INDIPENDENTE DI CONTROLLO

COMMITT.: ARS AMBIENTE SRL	
REPORT N.: ARS 001/18	
DATA ANALISI: 20.04.2018	
LUOGO ANALISI - IMPIANTO: PIATTAFORMA ECOLOGICA DI SEVESO	
BACINO / FORMULARIO / DDT: N.A.	
PRODOTTO / CER: 200301	
QUANTITATIVO CONFERITO: N.A.	
TARGA DEL MEZZO: N.A.	

	KG	%
CAMPIONE	109,20	100,00
SOTTOVAGLIO < 2 CM 1	24,46	22,40
SOTTOVAGLIO TOT. 1.1	24,46	22,40
LEGNO 2	0,36	0,33
CARTA 3	27,00	24,73
CARTONE 4	2,06	1,89
PELLE - CUOIO 5	0,00	0,00
CPL IN PLASTICA 6	0,62	0,57
PLASTICA FILM 7	4,04	3,70
ALTRA PLASTICA 8	4,72	4,32
TESSILE 9	14,04	12,86
ALTRI RIF. PERICOLOSI 10	0,00	0,00
CONTENITORI T/F 11	0,00	0,00
PILE - BATTERIE 12	0,32	0,29
FARMACI 13	0,00	0,00
ORGANICO 14	4,58	4,19
ALTRI INERTI 15	0,00	0,00
ALLUMINIO 16	0,34	0,31
METALLI 17	0,44	0,40
ALTRO (*) 18	26,06	23,86
VETRO 19	0,16	0,15
VETRO TOTALE 19.1	0,16	0,15

23.9% not
recyclable
fractions in
residual waste

76.1% still
recyclable !

Worth +11
percentage points
of separate
collection

Separate
collection could
reach 92 % !

Can PAYT reduce total waste?

NO.

Seveso: -0.7% total waste generated

Others: -0.9%



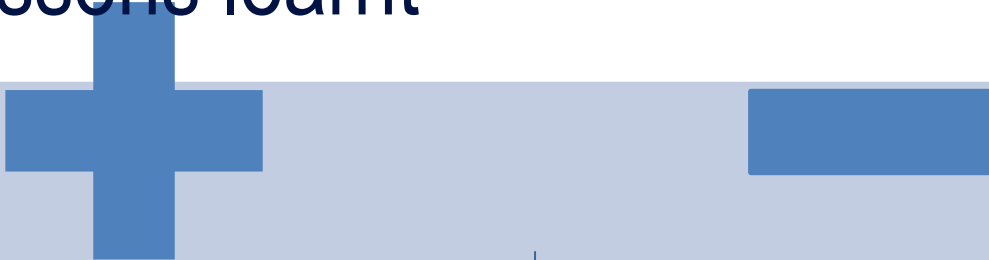
Residual waste



Recyclables



PAYT – lessons learnt

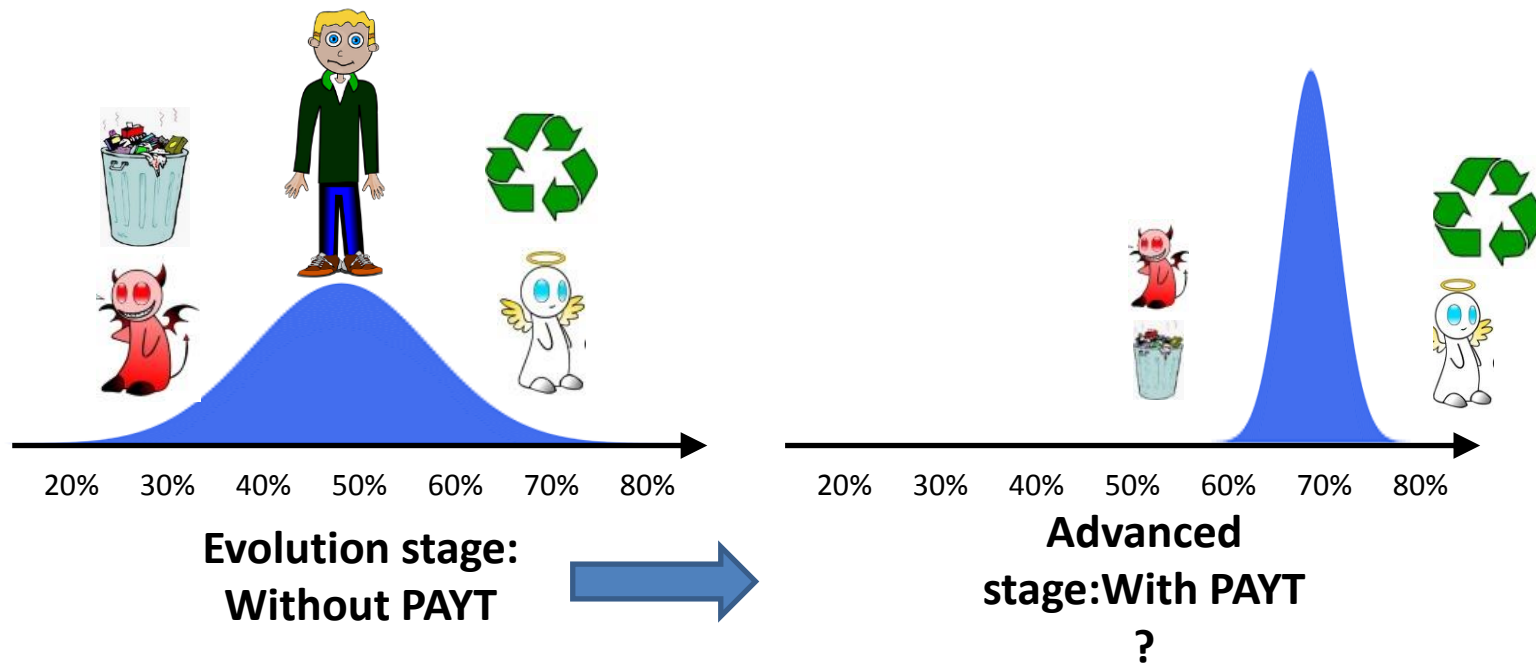
- 
- Individual identification
 - Very high recycling rate and minimization of residual
 - Visibilization of the content of the transparent bag
 - Limited incentivizing part when residual waste is low
 - Many citizens didn't even realize
 - High technology and data crossing
 - Pay attention to littering
 - Not really a waste prevention action



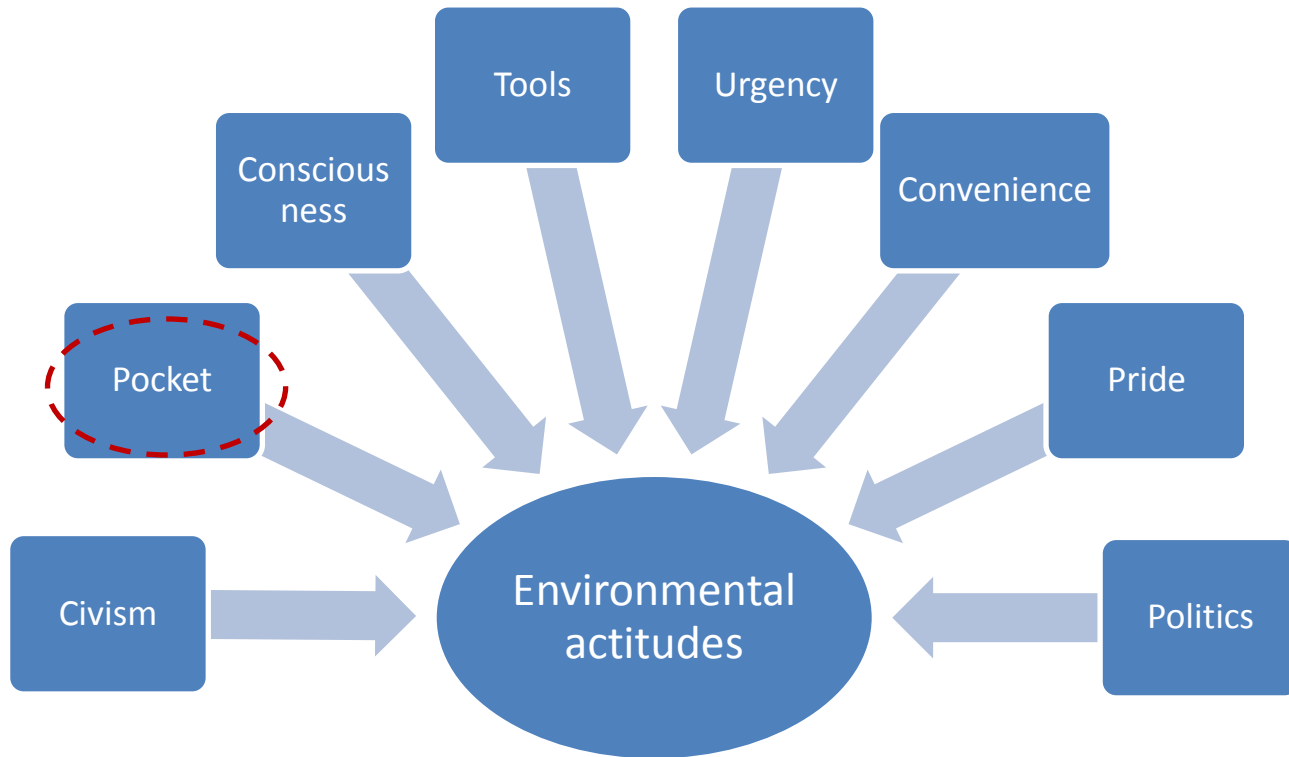
Some considerations

PAY AS YOU THROW, REALLY NECESSARY?

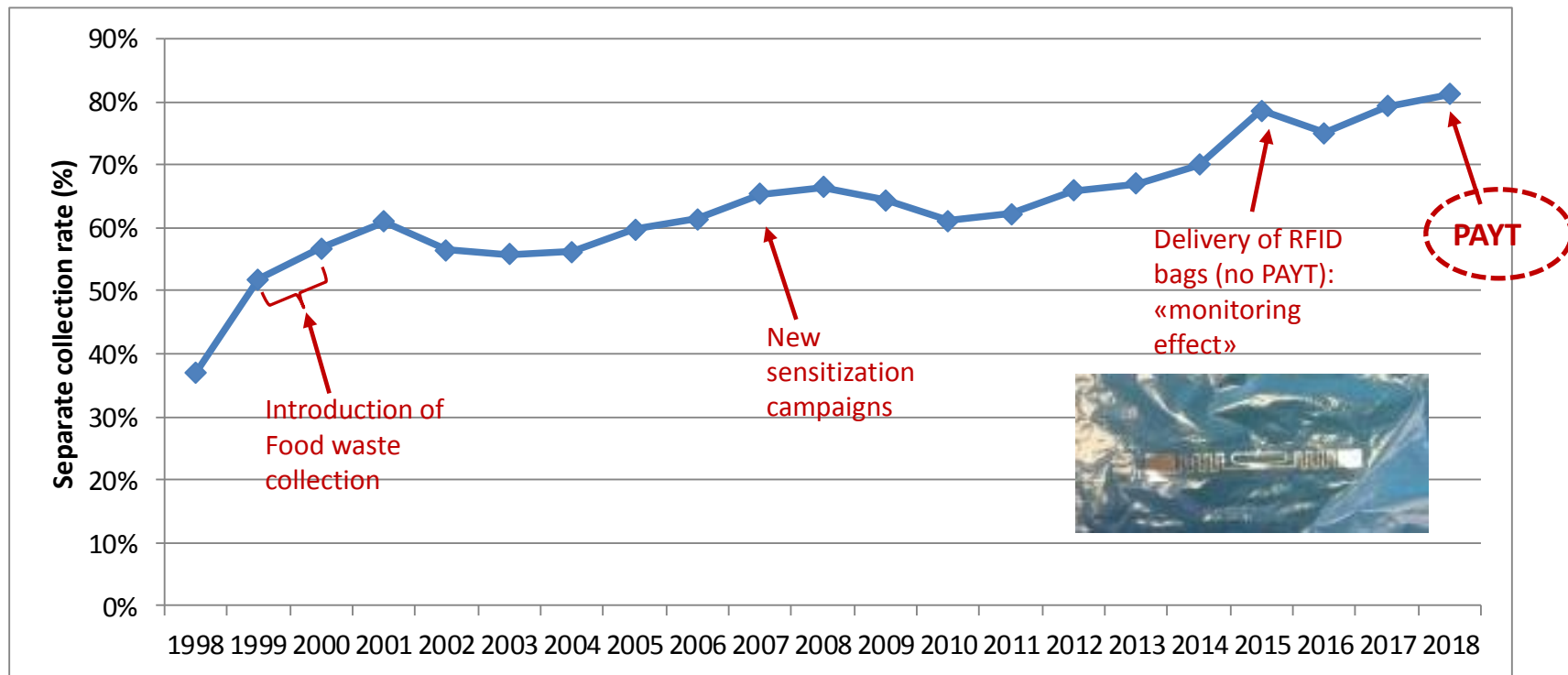
Variability between good and bad guys



Pay-As-You-Throw... one of the (many) tools



Seveso: 20 years history



PAY AS YOU THROW OR SIMPLY... KNOW AS YOU THROW?



Know as you throw (M. Giavini, 2017 + JRC BEMP report)

- PAYT usually provides info once per year
- KAYT = Give individual, detailed, frequent feedbacks
 - Citizens feel monitored and improve their habits accordingly
 - “real” real time data access
 - Specific and individual sensitization campaigns
 - **Give individual positive feedbacks**



JRC SCIENCE FOR POLICY REPORT

Best Environmental Management
Practices for the Waste
Management Sector

«PAYT» or «KAYT»



Conclusion

- Very high levels of separate collection (80%) are possible everywhere, even in difficult areas (remote, dense)
- Constant social actions and citizens involvement is key
- **Pay As You Throw** can be an useful tool, but **Know As You Throw** is often easier and better accepted

Thanks

Michele Giavini
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www.waste4think.eu 2016-2019

