

PAYT timeline, results, (and KAYT)

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July 6th, online

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ARS and CIC



PAYT: timeline for the implementation

History and key data from > 1,000 italian municipalities with PAYT

Italy. Full history of PAYT regulation

- 1931 : municipalities are authorized to establish a waste tax
- 1982: Decree 915: Municipalities have to introduce a waste tax aiming at getting to a balance between costs and revenues
- 1993: Decree 507. Waste tax “can be related to the quantity or quality”
- 1997: Decree 22. Waste tax must have a mandatory variable part



1931 — RELAZIONE E REGIO DECRETO 14 settembre 1931, n. 2178.

Testo unico per la finanza locale.

SEZIONE II. — Corrispettivo per il servizio di ritiro e trasporto delle immondizie domestiche.

Art. 268.

(Corrispettivo).

I comuni che, in aggiunta al servizio obbligatorio di nettezza dell'abitato, provvedono, a proprie spese e con l'osservanza di opportune norme igieniche, approvate dal prefetto, sentito il parere del medico provinciale, al servizio di ritiro e trasporto delle immondizie domestiche, sono autorizzati a riscuotere, in base a tariffa, il corrispettivo di quest'ultimo servizio.

L'ammontare complessivo dei corrispettivi per ciascun anno non può superare la somma inserita nel bilancio comunale dell'anno stesso, quale spesa effettiva per il detto servizio di ritiro e trasporto delle immondizie domestiche.

15-12-1982 - GAZZETTA UFFICIALE DELLA REPUBBLICA ITALIANA - N. 343

LEGGI E DECRETI

Sezione II

TASSA PER LO SMALTIMENTO DEI RIFIUTI SOLIDI URBANI INTERNI

Art. 268 - Tassa. — Per i servizi relativi allo smaltimento (nelle varie fasi di conferimento, raccolta, cernita, trasporto, trattamento, ammasso, deposito, scarica sul suolo e nel suolo) dei rifiuti solidi urbani interni, i comuni devono istituire apposita tassa annuale in base a tariffa il cui gettito complessivo può superare il costo dei servizi stessi.

I comuni devono tendere verso il conseguimento del pareggio tra gettito globale della tassa e costo erogazione del servizio.

Dal costo suddetto devono essere dedotte le entrate derivanti dal recupero e dal riciclaggio dei rifiuti sotto forma di materiali o energia.

4. La tariffa è composta da una quota determinata in relazione alle componenti essenziali del costo del servizio, riferite in particolare agli investimenti per le opere ed ai relativi ammortamenti, e da una quota rapportata alle quantità di rifiuti conferiti, al servizio fornito, e all'entità dei costi di gestione, in modo che sia assicurata la copertura integrale dei costi di investimento e di esercizio.

Baseline regulation.. Full history

- 1999: Decree 158.
 - Municipalities have 8 years time to get to 100% of waste cost coverage through the waste tax
 - Standard coefficients to calculate the variable part
- 2013: law 147
 - Waste tariff as a «service tariff» with VAT when managed by the waste collection company
- 2017 : Decree 20/4/17
 - Measurement criteria for PAYT

Articolo 11

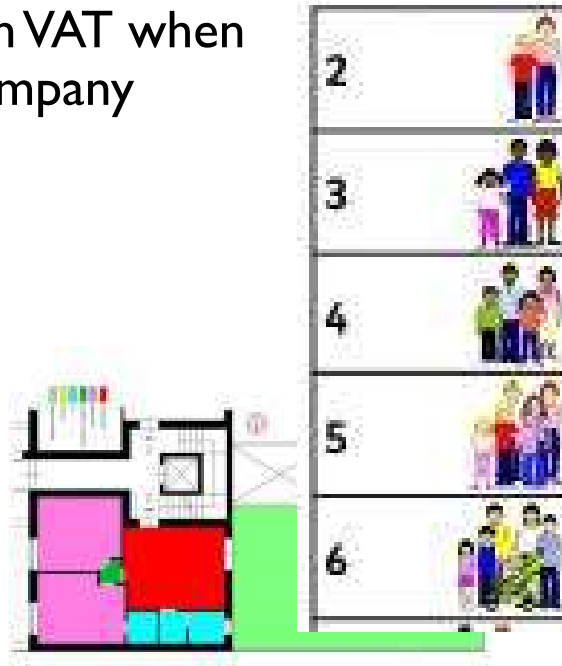
Disposizioni transitorie

1. Gli enti locali sono tenuti a raggiungere la piena copertura dei costi del servizio di gestione dei rifiuti urbani attraverso la tariffa entro la fine della fase di transizione della durata massima così articolata:
- a) quattro anni per i Comuni che abbiano raggiunto nell'anno 1999 un grado di copertura dei costi superiore all'85%;
 - b) cinque anni per i Comuni che abbiano raggiunto un grado di copertura dei costi tra il 55 e l'85%;
 - c) otto anni per i Comuni che abbiano raggiunto un grado di copertura dei costi inferiore al 55%;
 - d) otto anni per i Comuni che abbiano un numero di abitanti fino a 5000, qualunque sia il grado di copertura dei costi raggiunto nel 1999.

TABELLA 2

Coefficienti per l'attribuzione della parte variabile della tariffa alle utenze domestiche

Numero componenti del nucleo familiare	COMUNI		
	Kb Coefficiente proporzionale di produttività per numero dei componenti del nucleo familiare		
	minimo	massimo	medio
1	0,6	1	0,8
2	1,4	1,8	1,6
3	1,8	2,3	2
4	2,2	3	2,6
5	2,9	3,6	3,2
6 o più	3,4	4,1	3,7



Timeline of PAYT in Italy



1997: obligation to have a variable part in the tax

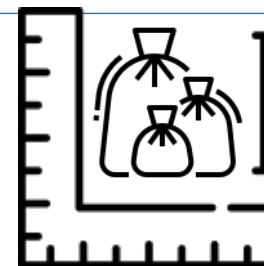
1999: Pioneers on PAYT with paper labels

≈2000 Standard bags system

≈2015 bags or buckets with RFID tag



Chamber System : pioneers 2010, firts with PAYT 2017



2017: Decree on measurement criteria

2020: National regulation authority



A more general timeline for lagging behind countries and municipalities

PHASE	MAIN ACTIONS AND OBJECTIVES	EXPECTED OUTPUT / MILESTONE
1. Establish a specific waste fee	Separate the waste fee from general property taxation to ensure transparency and earmarking for waste services.	Municipal waste fee ordinance (not property-based).
2. Increase willingness to pay and compliance	Communication campaigns emphasizing the "polluter-pays" principle and the shared responsibility for the product life cycle principle: everyone must contribute to cost coverage before any variable tariff can be applied.	Payment compliance > 90%.
3. Achieve full cost coverage (100%)	Gradually align waste fee revenues with total waste management costs (collection, treatment, disposal).	Financial sustainability of municipal waste services.
4. Build and integrate user databases	Create or consolidate databases linking waste generators, property records, and census data.	A functioning, integrated database of taxpayers and users.
5. Establish a complete separate collection scheme (including organics)	Ensure all households and commercial users are equipped with containers or bags for each fraction (residual, recyclables, organics). Develop logistics and treatment capacity, especially composting.	Fully operational separate collection system covering at least 70–80% of waste, with functioning organic waste collection and treatment.
6. Pilot user identification systems	Introduce simple tools: RFID tags on bins, standard pre-paid bags, or access-card containers.	First ID and traceability of waste generators.

Source: ARS ambiente

A more general timeline for lagging behind countries and municipalities

PHASE	MAIN ACTIONS AND OBJECTIVES	EXPECTED OUTPUT / MILESTONE
7. Enforce standardization and limit evasive behavior	Regulate the use of standard bags and locked containers; apply sanctions for non-compliance.	Controlled system with traceable waste inputs.
8. Introduce KAYT elements	Send informative statements showing that users are controlled and compared to peers. Simulate new PAYT bills to show potential savings and encourage behavior change.	Behavioral adaptation before real PAYT.
9. Define PAYT coefficients	Design tariff structure: fixed vs variable parts. Base coefficients on WR generation, family size, dwelling surface, etc.	Technically justified tariff model.
10. Approve municipal PAYT ordinance	Official adoption of PAYT by local council, defining rates, coefficients, enforcement, and data management.	Legal framework for PAYT implementation.
11. Gradual enforcement and yearly adaptation	Monitor “borderline” users, refine coefficients, and update communication and data.	Stable PAYT system with increasing user acceptance.
12. Long-term consolidation and transition to KAYT	Once PAYT achieves full behavioral alignment, economic pressure can be relaxed. Focus shifts to KAYT instruments and social norms.	Sustainable waste prevention culture.

Source: ARS ambiente

Italy: IFEL report, the masterpiece

- IFEL, foundation dealing with municipal taxes, from the national Association of Municipalities (ANCI)
- Credits: Davide Donadio and others

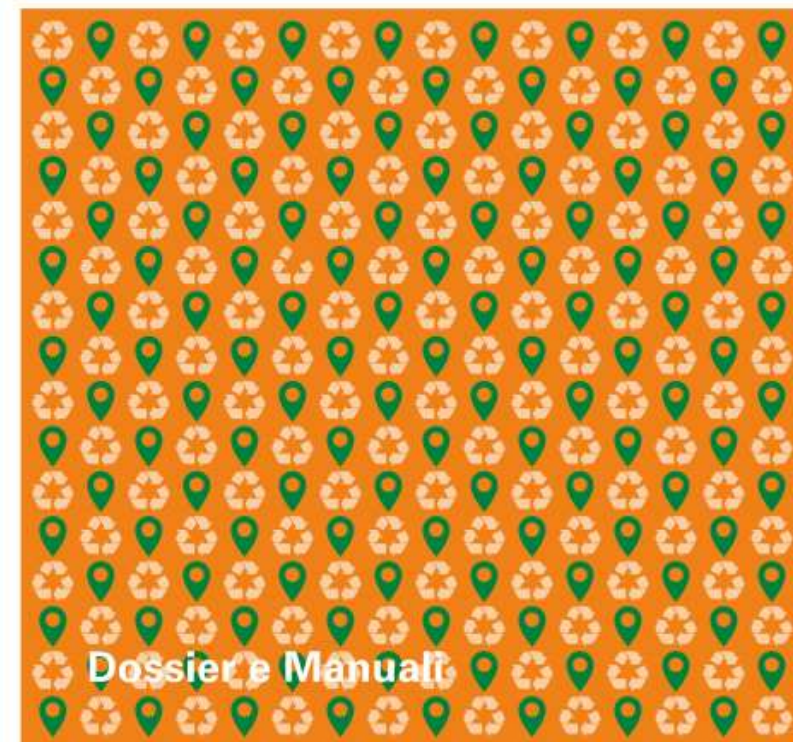
<https://www.fondazioneifel.it/ifelinformations/item/11988-la-tariffazione-puntuale-in-italia-iv-rapporto-ifel>



La tariffazione puntuale in Italia

Con una introduzione al TICSER ARERA (del. 396/2025)

IV Rapporto IFEL - Dati 2023





2 · THE NUMBERS

Key figures: 1,196 municipalities, 15% of the system

1,196

Municipalities in PAYT (2023)

15.1%

Share of all Italian municipalities

~8.96M

Inhabitants served by PAYT

+0.9M

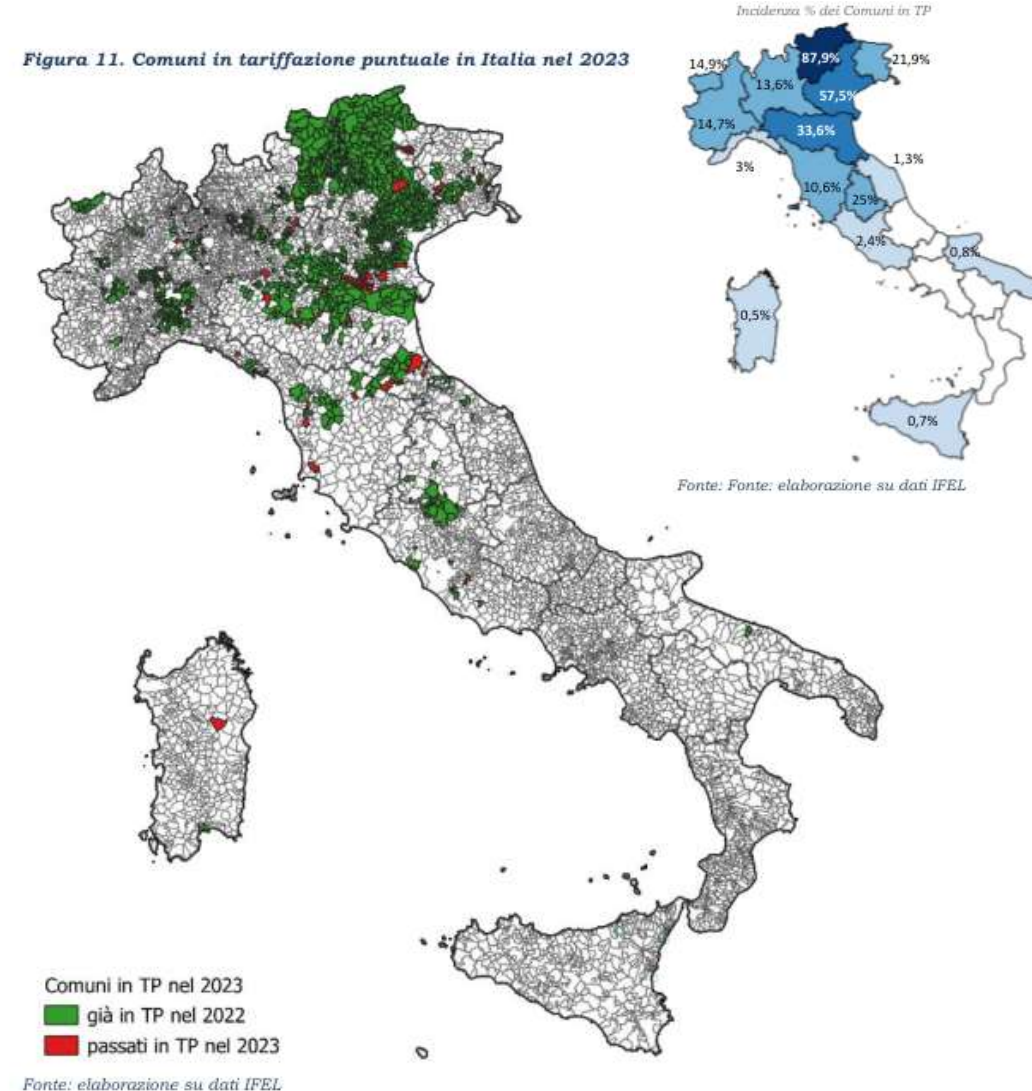
Population added in one year

- Steady growth over 2019–2023: from 930 to 1,196 municipalities (≈ +30%).
- Population served rose even faster — from ≈ 6.9M to nearly 9M — as larger towns adopt PAYT.
- PAYT is no longer a niche of small pioneer towns: it is now a structural, though still minority, component of the national TARI/TARIP picture.



A "cluster" geography: North leads, South nearly absent

- North-East holds the absolute majority of PAYT municipalities (≈ 60%) and over three-fifths of the population served.
- North-West adds a further third of municipalities and about a quarter of the PAYT population.
- Centre stays at modest levels in both municipalities and population, but shows signs of expansion.
- South and Islands remain marginal: very few municipalities, with a single new entry in 2023 (Nuoro).
- Diffusion happens by wide-area "clusters" — driven by supra-municipal governance, in-house or long-term contracts, and regional support (e.g. 21 municipalities in Rovigo province; coordinated expansions in Friuli-Venezia Giulia, Piedmont, Veneto, Emilia-Romagna).
- Takeaway for the South: without wide-area governance and regional support, launching and sustaining PAYT remains hard and prone to litigation.



<https://www.fondazioneifel.it/ifelinforma-news/item/11988-la-tariffazione-puntuale-in-italia-iv-rapporto-ifel>

Environmental performance: above 85% sorting

6 · RESULTS



~520

PAYT municipalities above
85% separate collection

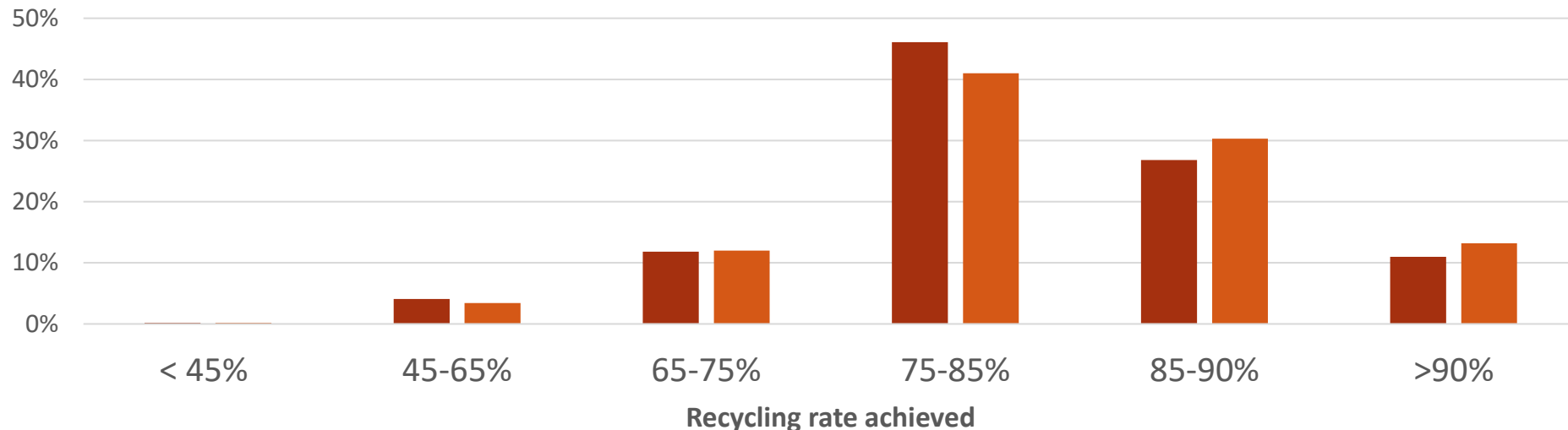
>40%

Of all PAYT municipalities

~3.7M

Inhabitants in those
municipalities

% of municipalities with PAYT vs. their recycling rate



■ 2022 ■ 2023

Source: IFEL report

Payt and population size

- PAYT implemented in municipalities of all sizes
- The golden spot is actually between 1,000 and 1,0000 inhabitants
- Very good results in large cities (Parma, Treviso, Ferrara...)

Tabella 12. Distribuzione dei Comuni in tariffazione puntuale per fasce demografiche e incidenza % a livello nazionale. Anno 2023

Fascia demografica	Comuni in TP	% sul totale Comuni in TP	Incidenza % su totale Comuni	Pop. dei Comuni in TP	% su pop. totale Comuni in TP	Incidenza % su totale pop.
Fino a 1.000 ab.	180	15,1%	8,9%	98.848	1,1%	9,1%
1.001 - 5.000 ab.	518	43,3%	14, 8%	1.399.488	15,6%	16,3%
5.001 - 10.000 ab.	265	22,2%	22,6%	1.881.167	20,99%	22,7%
10.001 - 20.000 ab.	161	13,5%	23,2%	2.173.106	24,24%	22,7%
20.0001- 50.000 ab.	55	4,6%	14,7%	1.657.176	18,49%	14,6%
50.001 - 100.000 ab.	9	0,8%	9,5%	659.601	7,36%	10,3%
Oltre 100.000 ab.	8	0,7%	18,2%	1.094.477	12,21%	8,0%
Totale	1.196	100,0%	15,1%	8.963.863	100,00%	15,2%

Fonte: elaborazione su dati IFEL; dati demografici ISTAT.

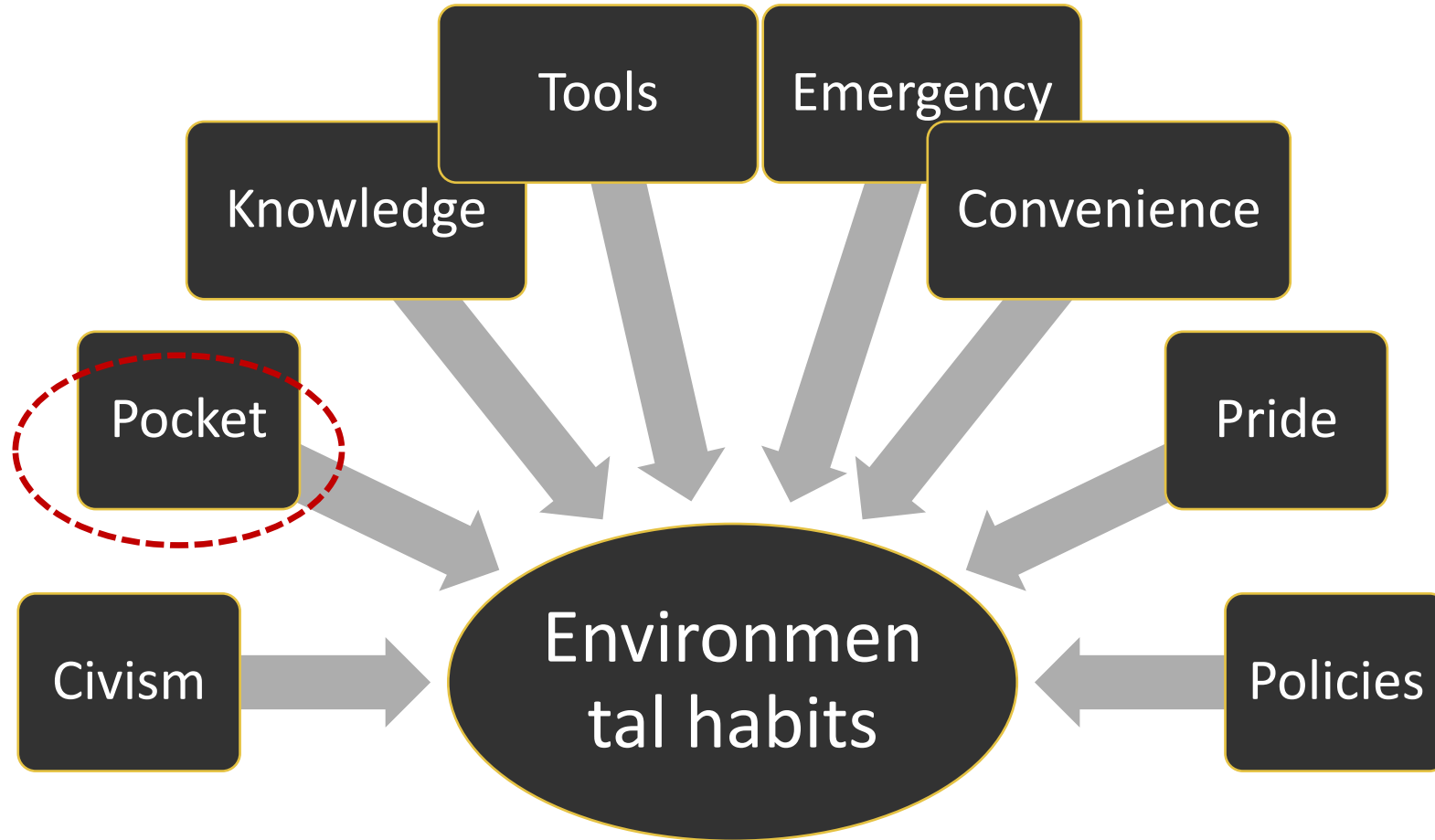
Payt and population size

- Little municipalities typically implement PAYT by grouping into aggregation of municipalities: this is actually encouraged by the new regulation under the national authority ARERA
- Groups of municipalities can have bureaucratic benefits (for instance, they prepare a single yearly waste financial plan if they have PAYT) and can delegate completely the tax to the collection company -> becoming a service fee
- Large cities must have a high political commitment to introduce PAYT -> typically they do it after getting to an already high recycling rate and citizen sensitization

PAYT and KAYT – Know As You Throw

Results from long term implementation

PAYT (Pay As You Throw), one of the (many) tools



Big (and lost?) data

- Italy, 5,6 M inhabitants: individual waste generation data used for PAYT
- 20-25 M inhabitants: data «lost» (not used by municipalities for any purpose)



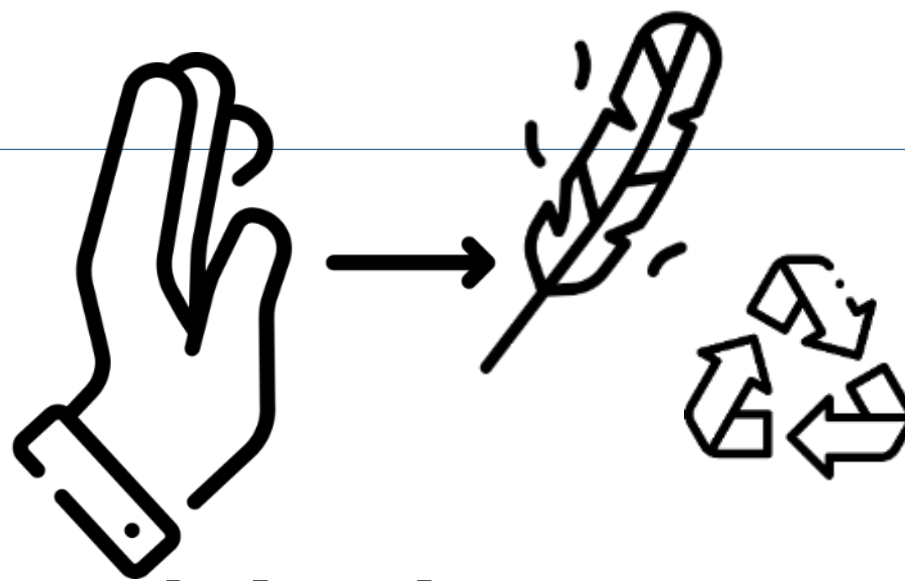
Bags with chip



40/120 liters
buckets/bins with chip



Locked containers with card
access

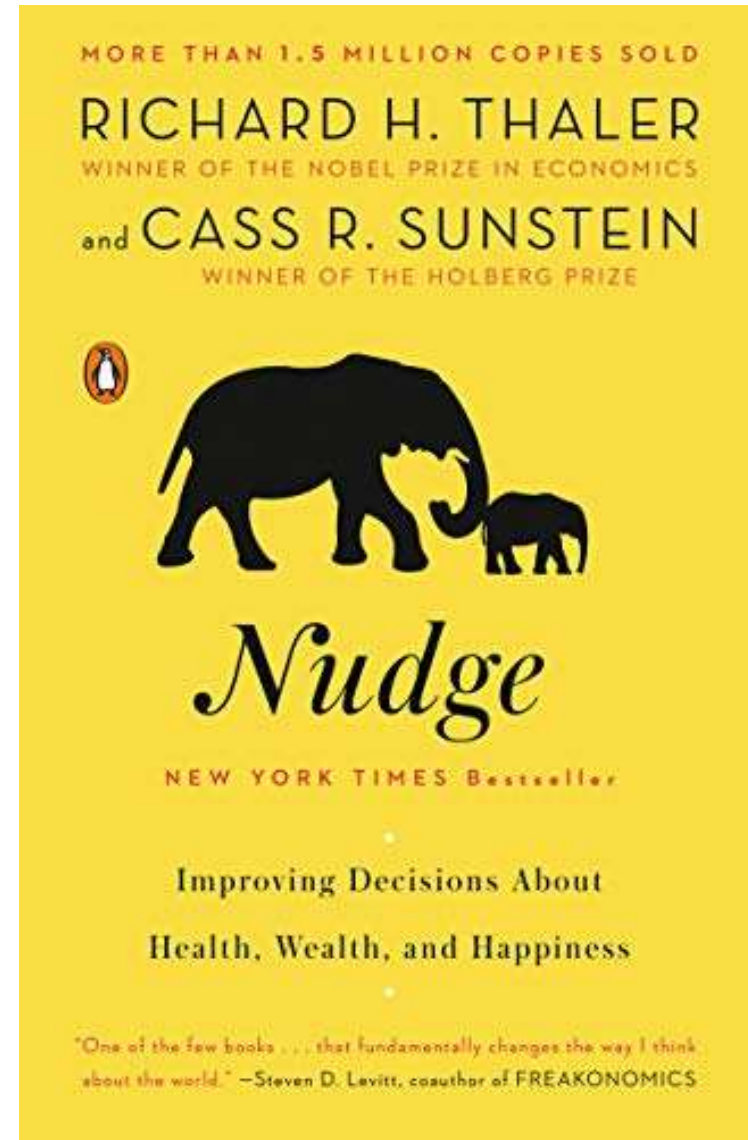


Nudging

Positive and constant recommendations

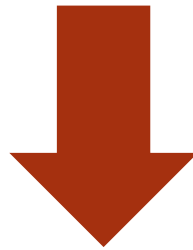
"A nudge, as we will use the term, is any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives. [...]"

Putting fruit at eye level counts as a nudge. Banning junk food does not."



Nudging – key elements

- encourage people to make better decisions **without imposing restrictions or mandates**.
- is classified as a **non-regulatory and economically viable** instrument for achieving policy goals (has limited political costs compared to traditional regulation)
- Nudging must be done **without altering economic incentives** and **without prohibiting any options**: it must be easy and cheap to avoid



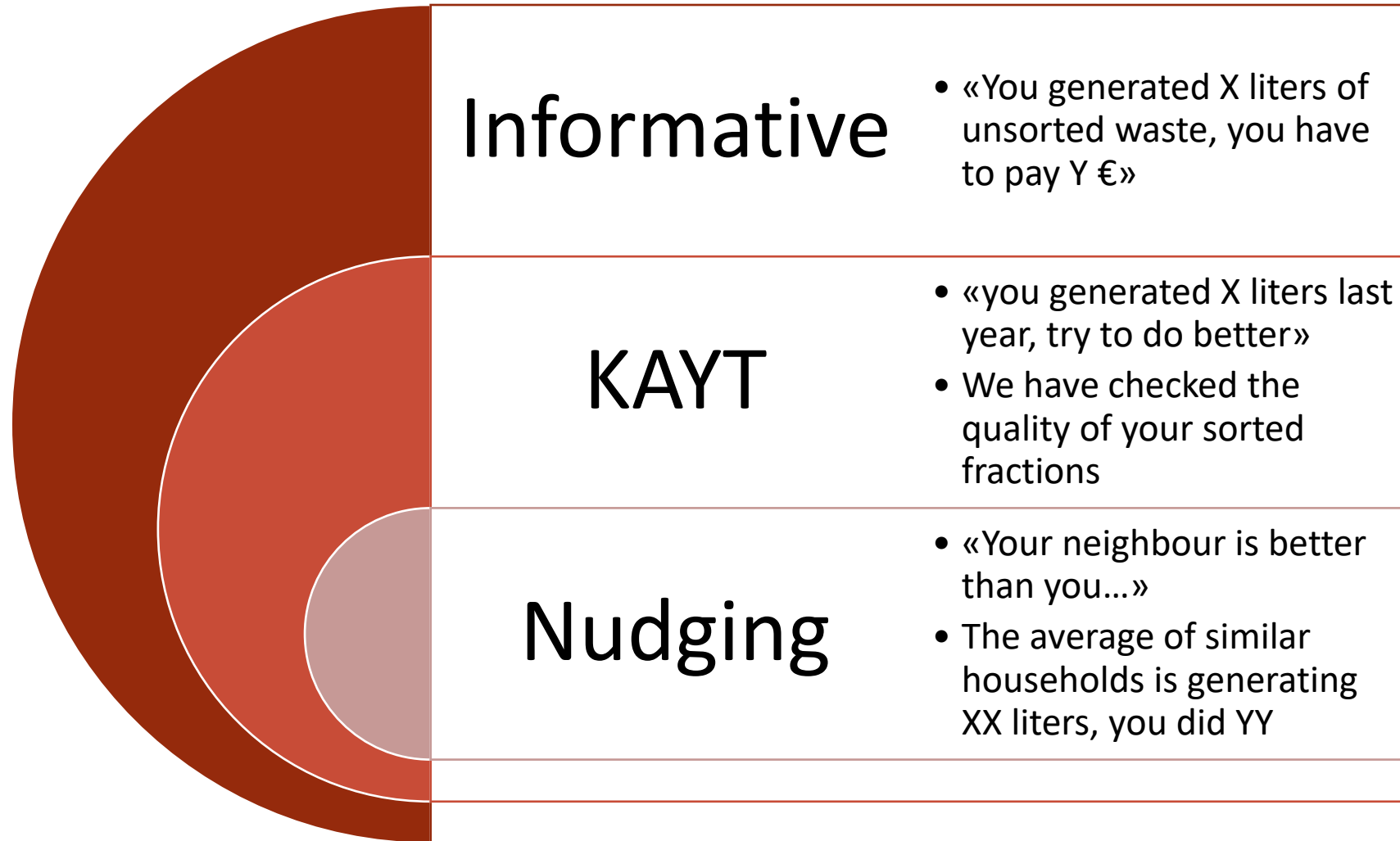
Implications for waste related projects:
PAYT (Pay As You Throw) is not nudging!!!

KAYT = Know as you throw

- PAYT usually provides info **once per year (invoice)**
 - **Many don't realize**
- KAYT = Give **individual**, detailed, **frequent** feedbacks
 - Citizens feel **monitored** and improve their habits accordingly
 - real time data access
 - Specific and **individual sensitization campaigns**
 - Don't give only negative feedbacks



Type of messages



Bergamo

- Innovative Know As You Throw through **vending machines** delivering individual bags with barcode, customized per household
- When getting a roll of bag, the users could get information on a large screen about their **individual performance** in recycling.



<http://www.arsambiente.it/a-bergamo-introdotto-il-sistema-kayt/>



KAYT in Bergamo: draft example - display

1

Good morning Mr Smith!

Are you doing it right?



In the last 6 months you picked:	3 rolls (30 bags)
Households like yours (4 people) in Bergamo picked as an average:	2,2 rolls (22 bags)

You can do better! Please separate properly.



next

KAYT in bergamo: draft example - display

2 ARE YOU DOING IT RIGHT?

Our statistics show that:

Your district (Longuelo) is the best performer of Bergamo, (75% separate collection)
Congratulations!



continua



2 Are you doing it right?

Random controls have been performed:

On 3/3/19 in an inspection we detected that your light packaging bag was properly separated, good!

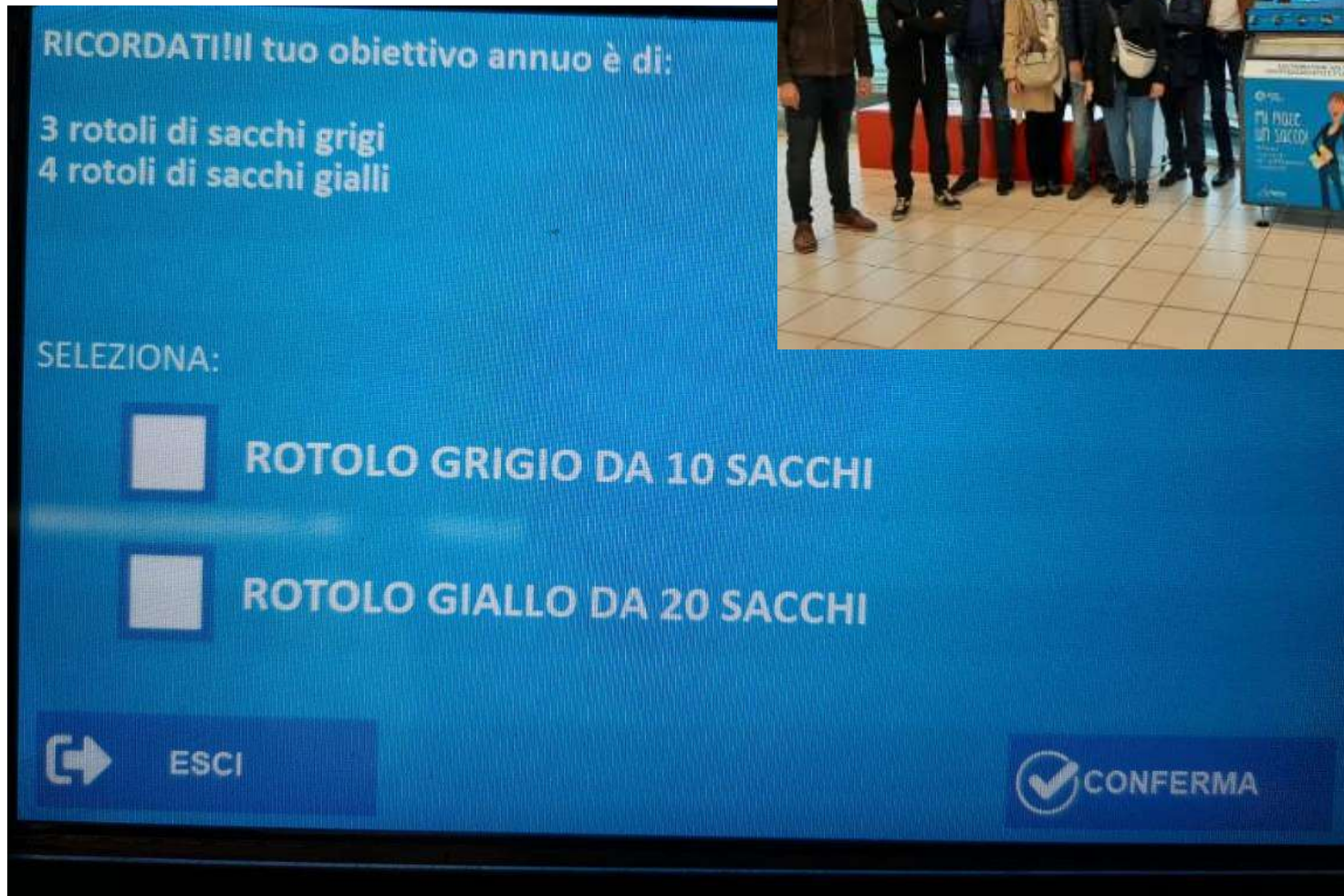


Learn how to better separate on www.zzzz.yyy

next

Bergamo – real implementation

- «Your yearly target of bags is XX»
- Do you still want some bags?



Bergamo – results

- **+4-5 points %** (up to 77%) just with this *nudging* scheme linked to
- Transparency
- Sense of being monitored
- Small bag
- Very limited PAYT part



Be transparent

- Typically, separate collection rate increases of **3-5 percentage points %** just shifting from black bags to transparent bags for residual waste
- Feeling of being controlled
- Semi-transparent

The key: say NO to “black hole” containers”



È fatto divieto assoluto di utilizzare sacchi neri per qualsiasi tipologia di conferimento, in quanto il loro impiego rende complicate le operazioni di smaltimento e separazione dei rifiuti, i quali devono essere sempre conferiti in buste trasparenti.

È necessario rispettare il calendario di raccolta in tutte le sue modalità, tenendo presente che i rifiuti vanno tassativamente depositati dalle ore 21.00 alle ore 24.00 del giorno precedente la raccolta. È assolutamente vietato depositare rifiuti il Sabato e fino alle ore 21.00 di Domenica.

I trasgressori verranno individuati e sanzionati dagli organi di vigilanza.

per informazioni **NUMERO VERDE** | **800 91 27 78**



Social norm nudging in Latina, Italy

- Baseline survey: «what could be useful to improve your habits in recycling?»
 - 30% answered «**get a feedback about my behaviour**»
- Nudging campaign with weekly controls and stickers
 - Use of **big data and visual inspections** of recycled fractions and residual waste
 - Red ones had a **small lifting part** to easily detach them (ability to «**hide**» one's bad behaviour)



<https://sartori-ambiente.com/sorriso-per-ambiente/>

Results

- 8 week campaign
- 224 buildings
- Unsorted waste reduced
- Quality of sorted fractions improved
 - Green smiles: +79%
 - Red smiles: -58%
 - Yellow smiles: -17%



Nudging in apartments

Improving food waste separation in Galway, Ireland

Irish EPA funded project



Results

- Results still to be disseminated: preliminary data show a 200-400 % increase, up to 800% in certain trials
- Most effective trials were “reach and nudge” ones
 - Reach out: Explain in detail the advantages of food waste separation, door to door, with a delivery of kitchen caddy and compostable bags
 - Nudge: place leaflets / posters using the social norm “others are better”
 - Convenience: place the brown bin closer to the entrance, reduce the volume of the black bin

Phase 2 Provisional Results



Key Takeaways:

Food Waste Bin Near the Entrance - Showing the highest relative increase in food waste collection across phase2

Phase 2 – Reach and Nudge Combined is also showing a relatively strong increase in food waste collection (Especially significant given that only 31% of people were directly reached)

https://www.linkedin.com/posts/michele-giavini-44789829_galway-activity-7209552968969293824-3ko6

KAYT (Know As You Throw): LIFE RethinkWaste

Informing citizens about their individual waste recycling behaviour,
rather than applying a variable tax

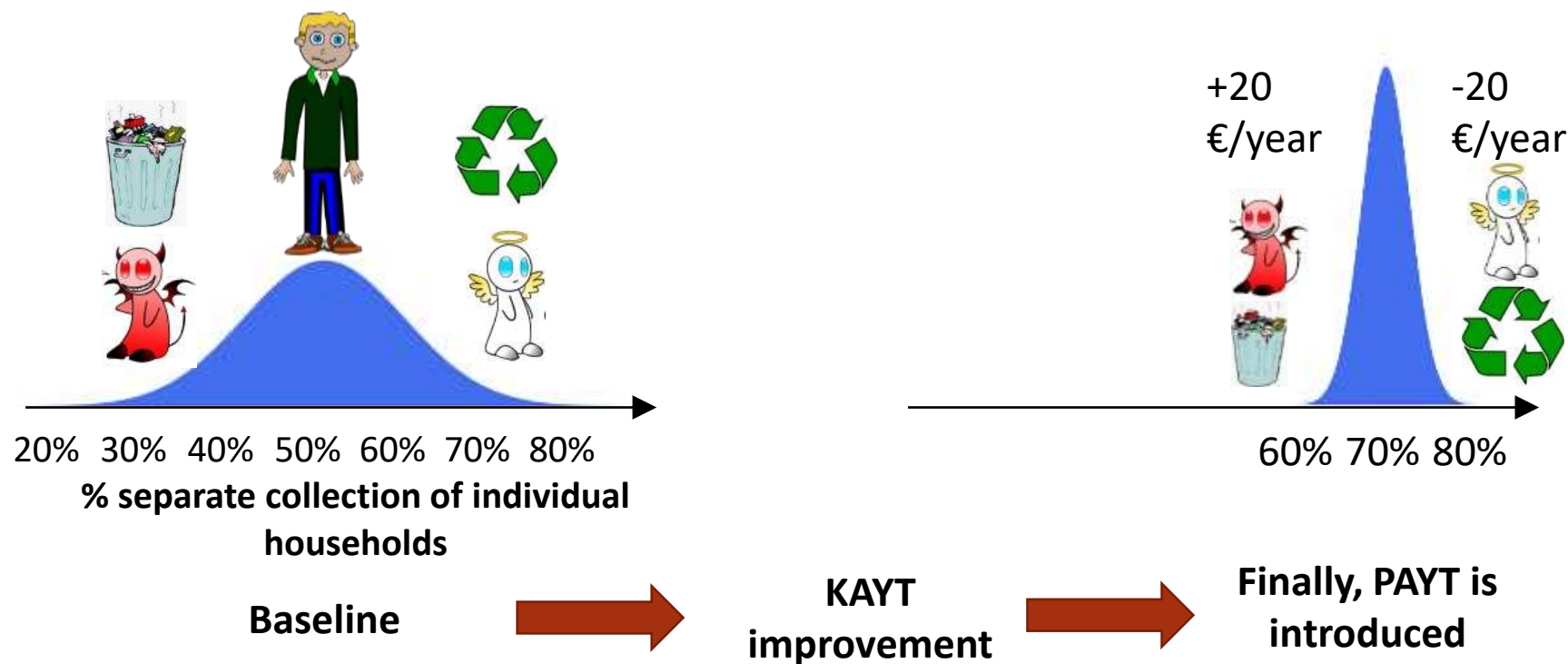


The RETHINKWASTE project has received funding from
the LIFE Programme of the European Union
under grant agreement n° 18 GIE/IT/000156

Behaviour variability

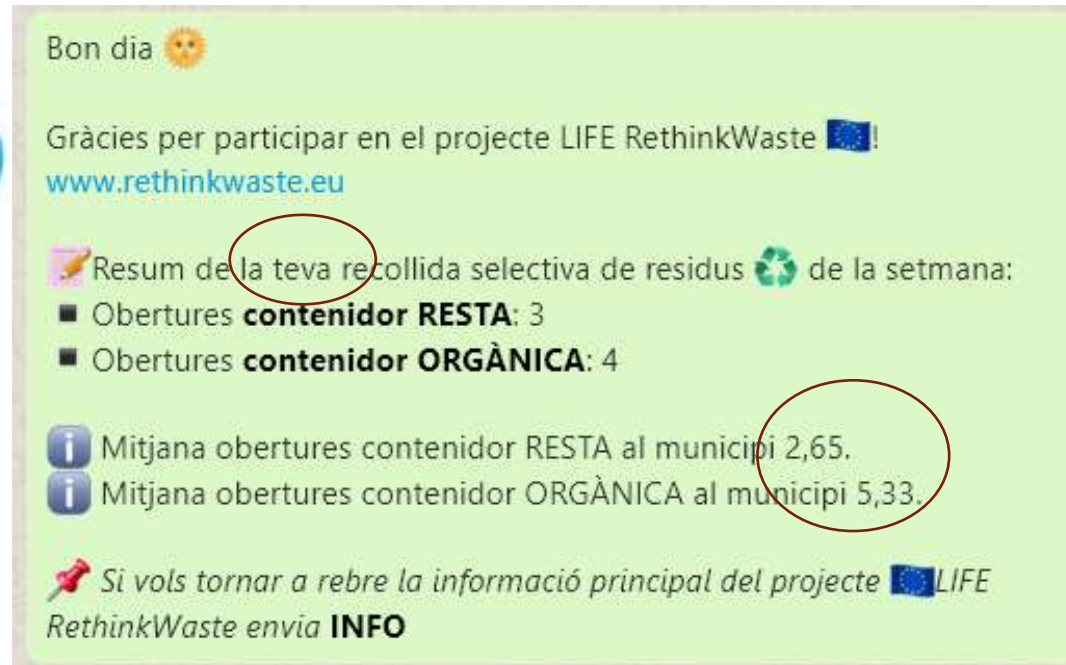


- The introduction of a «Know As You Throw» element strongly reduces the variability of behaviours between the «good recyclers» and «bad guys»



Whatsapp messaging platform as a nudging tool

St Just Desvern, Catalonia: locked containers with card access



KAYT controls in buildings



Chiesa28

15:14 ✓

Hai caricato un'immagine per il palazzo Chiesa28, ora hai un minuto di tempo per caricare tutte le immagini collegate al palazzo

15:14



Un **eco-coach** 🌱 ha visitato il vostro palazzo e ha verificato la raccolta differenziata dell'organico. ♻️ Vuoi sapere come è andata? rispondi **UMIDO** e guadagni 2 punti!

20:42 ✓

Umido

20:45 ✓



👍 Nel vostro edificio state facendo bene la raccolta dell'organico. Ma, Attenzione! !! !! Abbiamo visto che ci sono dei **sacchetti non compostabili**, in polietilene. Sono vietati! 🚫 Utilizza solo quelli compostabili! 🌱

20:51 ✓



USERS INTERACTION



Bon dia ☺️! 🌱 **EL REpte DE LA SETMANA.** Saps quins són els plàstics d'un sol ús dels quals s'ha prohibit la venda? 📧 Escriu la paraula **FOTO** i t'enviarem una fotografia amb alguns d'aquests objectes, a veure si els identifies! #SantJustcanviaelxip #apuntatalrepte #reciclamésimillor 📌 Si vols tornar a rebre informació general del projecte LIFE RethinkWaste, envia INFO El teu codi d'usuari és dmx7h5

📌 Si vols tornar a rebre la informació general del projecte LIFE RethinkWaste envia INFO

15:29



Conclusions

Some takeaways

- The use of **nudging in environmental behaviour improvement** have been used extensively in some fields (mobility, water and energy saving) but not much in waste recycling habits
- Recently there's a lot of focus across the EU variable charging tariffs (PAYT = economic leverage to change habits) but **the use of solely economic incentives may lead to some adverse effects and a not good perception**
- The use of **big data** and customized informative campaigns can be very effective by **leveraging the social norm effect**, and maybe cheaper than other traditional campaigns
- Citizen can **maintain** their improved habits if they **feel surrounded** by good performers



Thanks

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