ZERO WASTE EUROPE LIVE!

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IGNASI PUIG VENTOSA

PAY AS YOU THROW: THE ULTIMATE SYSTEM TO REDUCE WASTE AND INCREASE RECYCLING
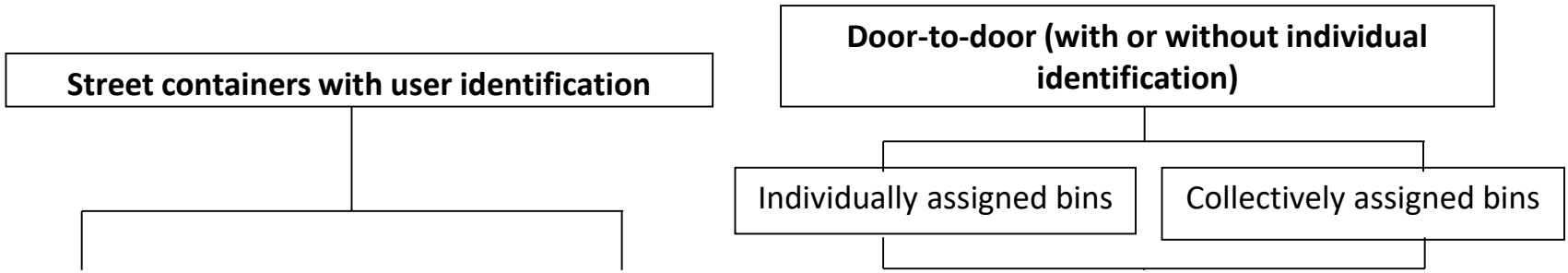
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- **Main types of PAYT schemes**

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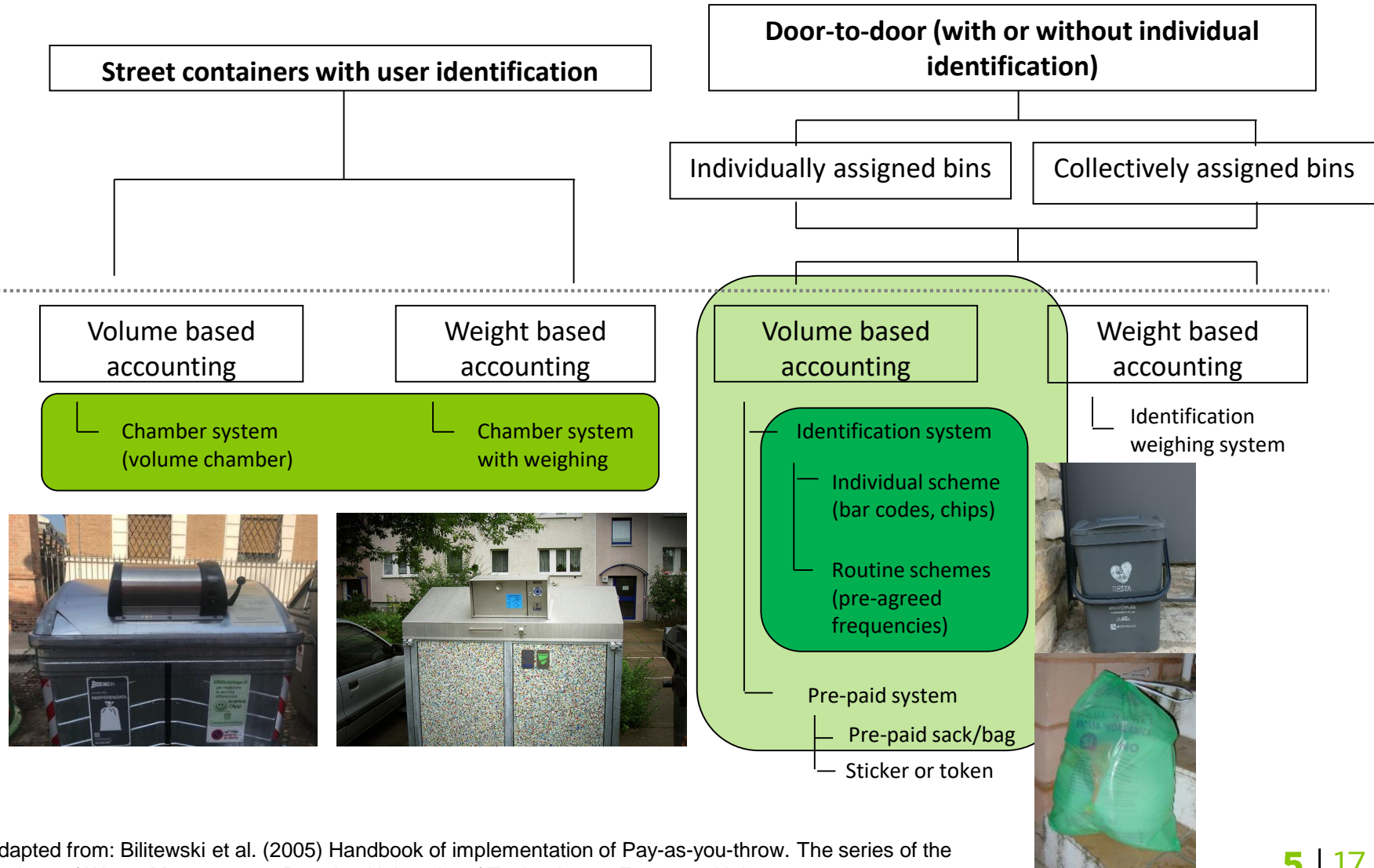# MAIN TYPES OF PAY-AS-YOU-THROW

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IDENTIFICATION

Street containers with user identification

Door-to-door (with or without individual identification)

Individually assigned bins	Collectively assigned bins

TYPES OF PAY-AS-YOU-THROW

IDENTIFICATION

| Street containers with user identification | | Door-to-door (with or without individual identification) |

| Individually assigned bins | Collectively assigned bins |

MEASUREMENT OF THE GENERATION OR SERVICES PROVIDED

| Volume based accounting | Weight based accounting | Volume based accounting | Weight based accounting |

- Chamber system (volume chamber)
- Chamber system with weighing
- Identification system
  - Individual scheme (bar codes, chips)
  - Routine schemes (pre-agreed frequencies)
- Pre-paid system
  - Pre-paid sack/bag
  - Sticker or token
- Identification weighing system

Adapted from: Bilitewski et al. (2005) Handbook of implementation of Pay-as-you-throw. The series of the Institute of Waste Management. Dresden University of Technology – European Union.

WEIGHT-BASED VS VOLUME-BASED SCHEMES

WEIGHT-BASED VS VOLUME-BASED SCHEMES

- **Volume-based**
  - Traditional approach.
  - The vast majority of experiences are volume-based.
  - It induces compaction.
  - **Bins/receptacles tend to be handed in full for collection – in door-to-door collection this makes collection faster.**
  - Volume more related to collection costs.
  - Some schemes have no technological requirements (e.g. routine based) -> lower costs.
  - In any case, less technological requirements, compared to weight-based.

- **Weight-based**
  - **More direct relation with generation.**
  - Weight more related to treatment costs.
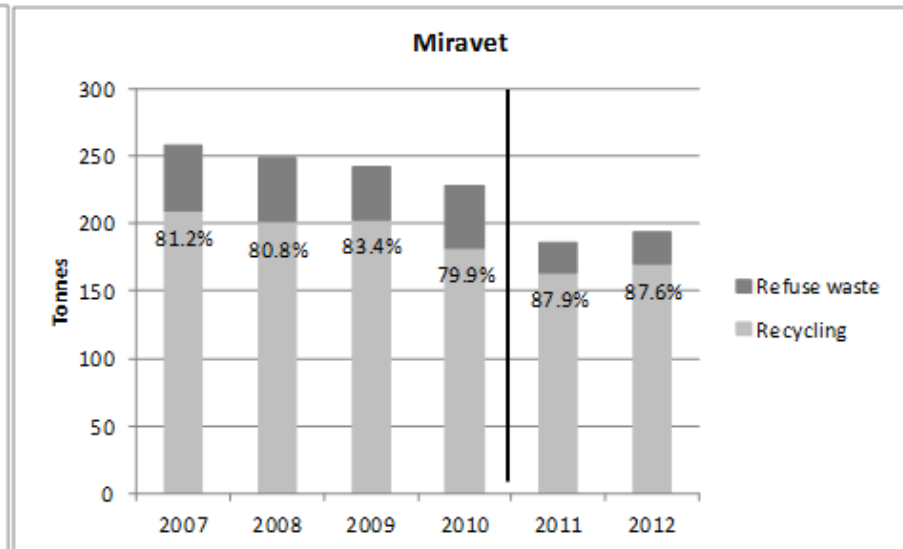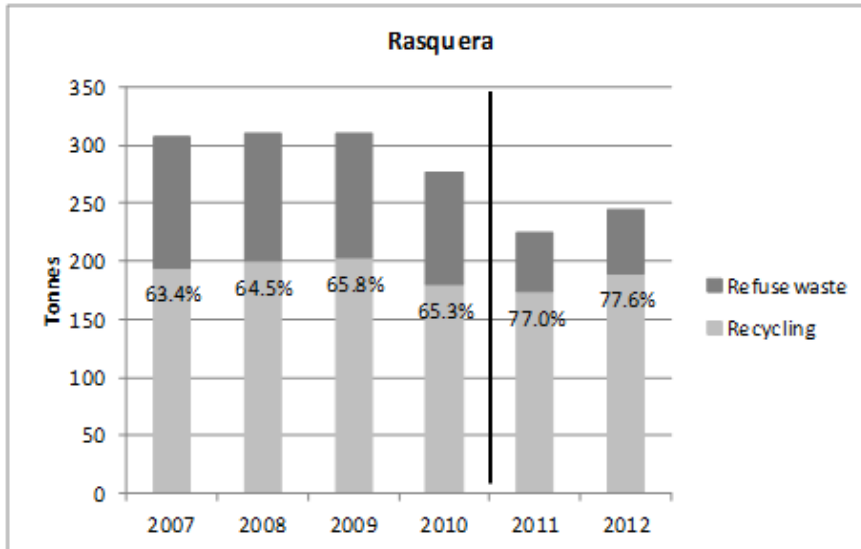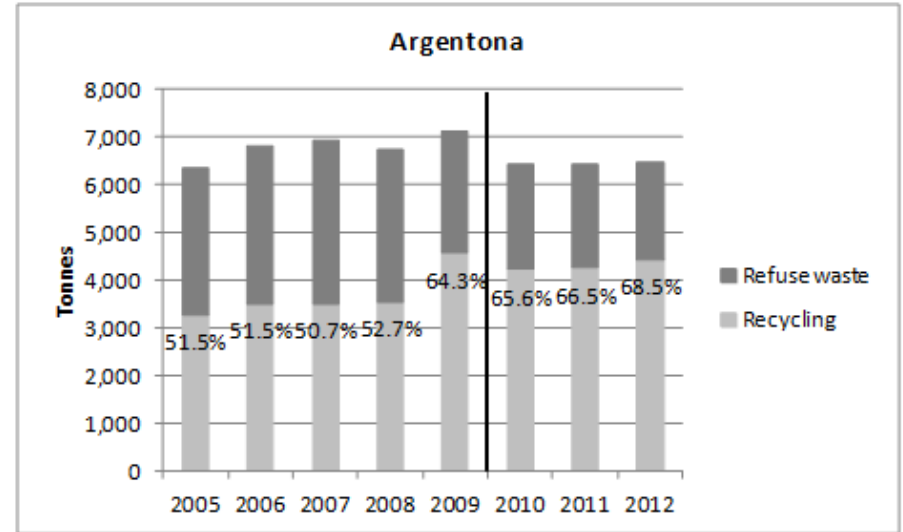 - Less experience.
  - More technological requirements.

PAYT IN SPAIN

PAYT IN SPAIN

Municipality	Region	Year of introduction	Type of scheme	Waste fractions being charged
Torrelles de Llobregat	Catalonia	2003	Pay-per-bag	Inorganics (Refuse + Packaging)
Esporles	Balearic Islands	2009	Pay-per-bag	Refuse
Argentona	Catalonia	2010	Pay-per-bag	Refuse, Packaging
Miravet	Catalonia	2011	Pay-per-bag	Refuse, Packaging
Rasquera	Catalonia	2011	Pay-per-bag	Refuse, Packaging
Maria de la Salut	Balearic Islands	2014	Pay-per-bag	Refuse
Binissalem	Balearic Islands	2014	Pay-per-bag	Refuse
Usurbil	Basque Country	2014	Pay-per-can with identification	Refuse
Porreres	Balearic Islands	2016	Pay-per-bag	Refuse
Mancomunitat es Raiguer (5 municipalities)	Balearic Islands	2017	Pay-per-bag	Refuse
Vilablareix	Catalonia	2018	"Pay-per-participation" with cans and identification	Biowaste, Packaging
Riudecanyes	Catalonia	2018	"Pay-per-participation" with cans and identification	Refuse, Biowaste, Packaging
Verdú	Catalonia	2018	Pay-per-can with identification	Refuse

PAYT WASTE CHARGES

- **16 experiences**

- **Net reduction of MSW generation, with possible slight rebound.**

- **Increased % of separate collection, but slight variations on absolute values.**

- **Quite significant reduction of refuse.**

Note: The vertical lines indicate the introduction of the unit-pricing schemes.

INDIRECT PAY-AS-YOU-THROW

INDIRECT PAY-AS-YOU-THROW

| When PAYT seems difficult, and intermediate step could be 'indirect pay-as-you-throw'.

| There are two main options:

- When a municipality pays to a supramunicipal waste authority which provides treatment (and maybe also collection) services, a fee-rebate scheme or a bonus-malus coefficient could be applied. Then an incentive would apply at the municipal level.

- When a municipality collects waste charges and has sufficient information on waste performance at a certain level of disaggregation (district, routes, etc.), a bonus-malus coefficient could be applied to a basic charges, thereby creating an incentive.

FEE-REBATE SCHEMES (1)

Municipalities tend to group themselves to provide services jointly, and optimize costs.

A feebate (fee + rebate) system is an economic tool whereby an association of municipalities fosters its members to advance towards recycling and prevention, by means of creating a set of fees and rebates.

Municipalities with poor results would pay an extra fee, whereas best performers would receive a rebate.

Fees and rebates would add up to zero, thus being neutral for the association of municipalities, but not for the municipalities themselves.

FEE-REBATE SCHEMES (2)

For each municipality and each waste fraction, fees and rebates would be defined as:

$$fb_{ij} = n_j * \left(\frac{t_{ij}}{pop_i} - \frac{\sum\limits_{i=1}^{p} t_{ij}}{\sum\limits_{i=1}^{p} pop_i} \right) * pop_i$$

p municipalities (i)
q treatments (j)

t_{ij} *tonnes from the municipality i of fraction j*
pop_i *population of municipality i*
n_j *constant defined for each treatment*

These *feebate* would add to the amount that municipalities would otherwise have paid. Some would pay more, some would pay less, but the proposed system would be neutral for the association.

BONUS-MALUS COEFFICIENTS

| The same idea could be articulated in the form of a coefficient.

| Citizens living in a municipality or district or... with results better than he average would be applied a coefficient <1, thus paying less than the average, and *vice versa*.

| This could be applied at the desired level of disaggregation: routes or even smaller areas, now that On-Board Vehicle Weighting is becoming more common.

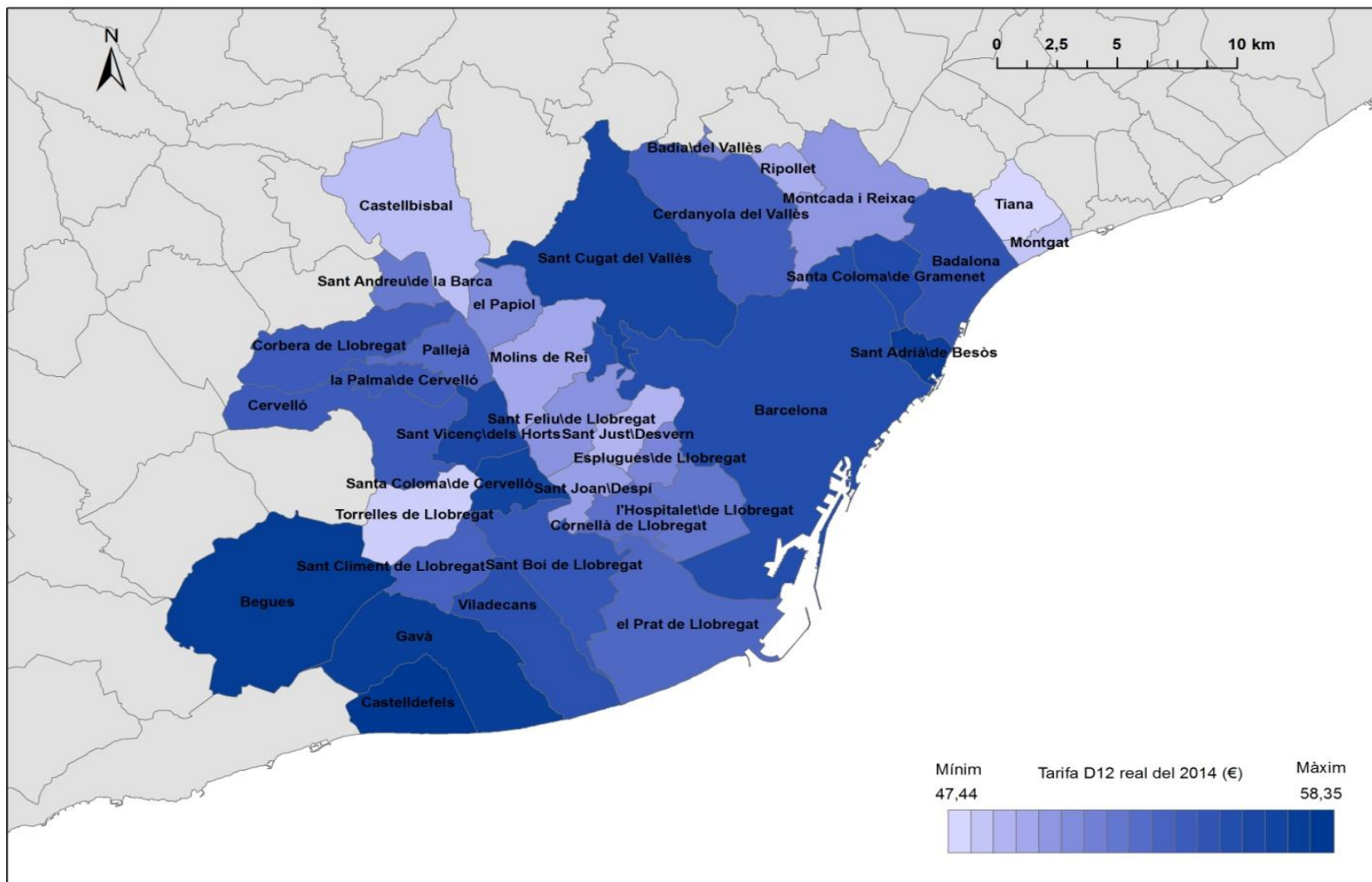# THE CASE OF THE METROPOLITAN AREA OF BARCELONA

Brief explanation of the Metropolitan Tax on Waste Treatment (TMTR)

- On basic tariffs defined for households and commercial activities, a municipal coefficient is applied, which depends on the per capita generation of unsorted waste.

- Calculation of the coefficient:

	2009-2013	2014-2017
Formula to calculate the municipal coefficient (Cfm_i)	$(1-n) + n \times \left(\dfrac{\frac{T_i}{hab_i}}{\frac{T_t}{hab_t}} \right)$	$(1-n) + n \times \left(\dfrac{\frac{\sum_{a=2010}^{2012} T_{i\,a}}{3 \cdot hab_{i\,2011}}}{\frac{\sum_{a=2010}^{2012} T_{t\,a}}{3 \cdot hab_{t\,2011}}} \right)$
Years of reference for the calculation of the generation index per capita of refuse	Last available year	Average of the previous three available years
n	15%	20%

- Changes in *n* affect the standard deviation of the coefficient.

The application of a bonus-malus coefficient in the Metropolitan Area of Barcelona

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Thanks for your attention!