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Practical comparison of alternatives for unit-based pricing of municipal waste. The experience of LIFE PAYT project.

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Introduction

- ▶ **Unit-based pricing** or *Pay-as-you-throw* (PAYT) has been successfully applied in Central and Northern Europe as a useful tool to reduce municipal waste (MW) generation.
- ▶ In Southern Europe, this method is not so extended: **LIFE PAYT** project has been testing for 5 years PAYT implementation in form of pilot experiences, developed in 5 five municipalities of Cyprus, Greece and Portugal.
- ▶ An overview of results and comparison of the alternatives applied will be here presented.

Project scope



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Location	Geographical profile	Population
Aveiro (Portugal)	Medium sized city	78450
Condeixa-a-Nova (Portugal)	Town (rural)	17078
Λάρνακα / Lárnaka (Cyprus)	Medium sized city	51468
Lisboa (Portugal)	Large city	552700
Βριλήσσια / Vriliissia (Greece)	Town (inserted in a large urban area)	30741

Project scope: Aveiro



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Residential area:
multi-storey
apartment buildings
+ single detached
houses.

- PAYT based on fixed volume (30L)/frequency
- Street containers with access controlled by electronic cards.



▶ 1200 inhabitants and 440 households in the pilot area.

Project scope: Vrilíssia

Residential area:
multi-storey
apartment
buildings.

- Weight-based
- Street containers equipped with a weighing device; access controlled by electronic cards

▶ 1500 inhabitants and 625 households in the pilot area.



Project scope: Lárnaka



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Residential area:
multi-storey
apartment buildings
+ single detached
houses.

- PAYT based on pre-paid marked bags.
- DtD collection.

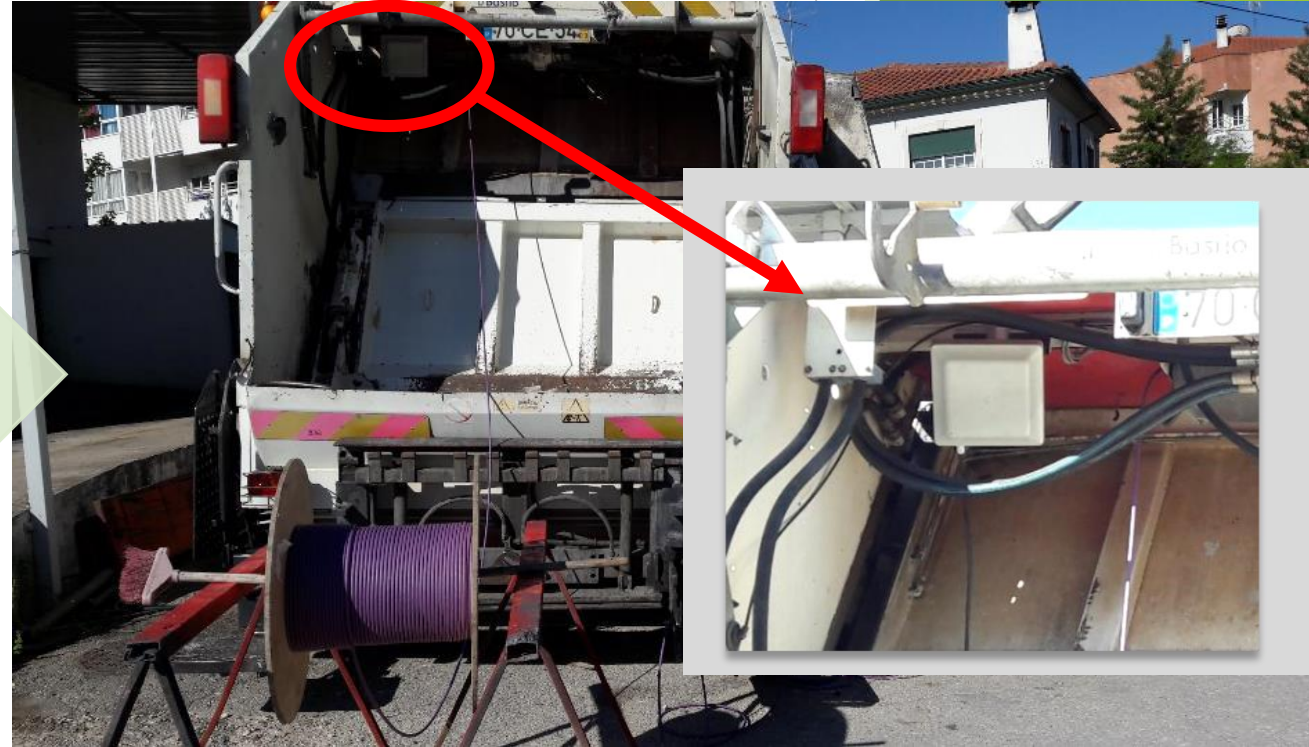


- ▶ 1500 inhabitants and 350 households in the pilot area.

Project scope: Condeixa

Non-domestic establishments.

- Based on frequency.
- Door-to-door (DtD) collection with individually identified bins.



► 400 establishments included.

Project scope: Lisboa



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Large non-domestic establishments.

- Fixed collection volume (number of bins contracted).
- DtD collection.








▶ 135 establishments included.

Evaluation methodologies

- ▶ The pilot experiences lasted several months, during which the project team collected as much information as possible regarding the performance of the different alternatives.
- ▶ An evaluation framework was built, considering the three key sustainability aspects:
 - ▶ Environmental: waste characterisation, Life Cycle Assessment (LCA)
 - ▶ Economic: monitoring municipal budget
 - ▶ Social: surveys to the population








Results: technical overview

Location	Technical performance	
Aveiro	 Fair	The lack of experience caused technical troubles (bin opening), which were eventually solved.
Condeixa	 Poor	The lack of experience caused technical troubles (data transmission to vehicles).
Lárnaka	 Good	The system is technologically simple.
Lisboa	 Good	The system is technologically simple.
Vrilíssia	 Fair	The lack of experience caused technical troubles (batteries, hardware), which were eventually solved.



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Results: economic overview

Location	Economic performance	
Aveiro	 Poor	The equipment price was rather high, since no market exists yet. However, it may improve after prototypes were successfully tested.
Condeixa	 Fair	The collection vehicles need a complex adaptation, but affordable.
Lárnaka	 Fair	The cost of bags is low, but constant on time.
Lisboa	 Good	There is no complex equipment, therefore it is not expensive.
Vrilíssia	 Fair	The price was affordable.



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Results: environmental overview

Location	Environmental performance	
Aveiro	 Fair	Decrease in mixed MW, increase in separate collection.
Condeixa	 Poor	The technical troubles hampered the participation.
Lárnaka	 Good	Decrease in global MW generation.
Lisboa	 Fair	There was an increase of separate collection, but MW generation grew anyway.
Vrilíssia	 Fair	Increase in separate collection.



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Results: social overview

Location	Social acceptance	
Aveiro	 Fair	Many residents collaborated, but others took their waste away.
Condeixa	 Good	The technical troubles hampered the participation.
Lárnaka	 Good	DtD collection enabled a high participation.
Lisboa	 Fair	In commercial sector, waste generation is still linked to economic activity.
Vrilíssia	 Fair	The PAYT idea was welcomed, but technical problems made some residents to desist.

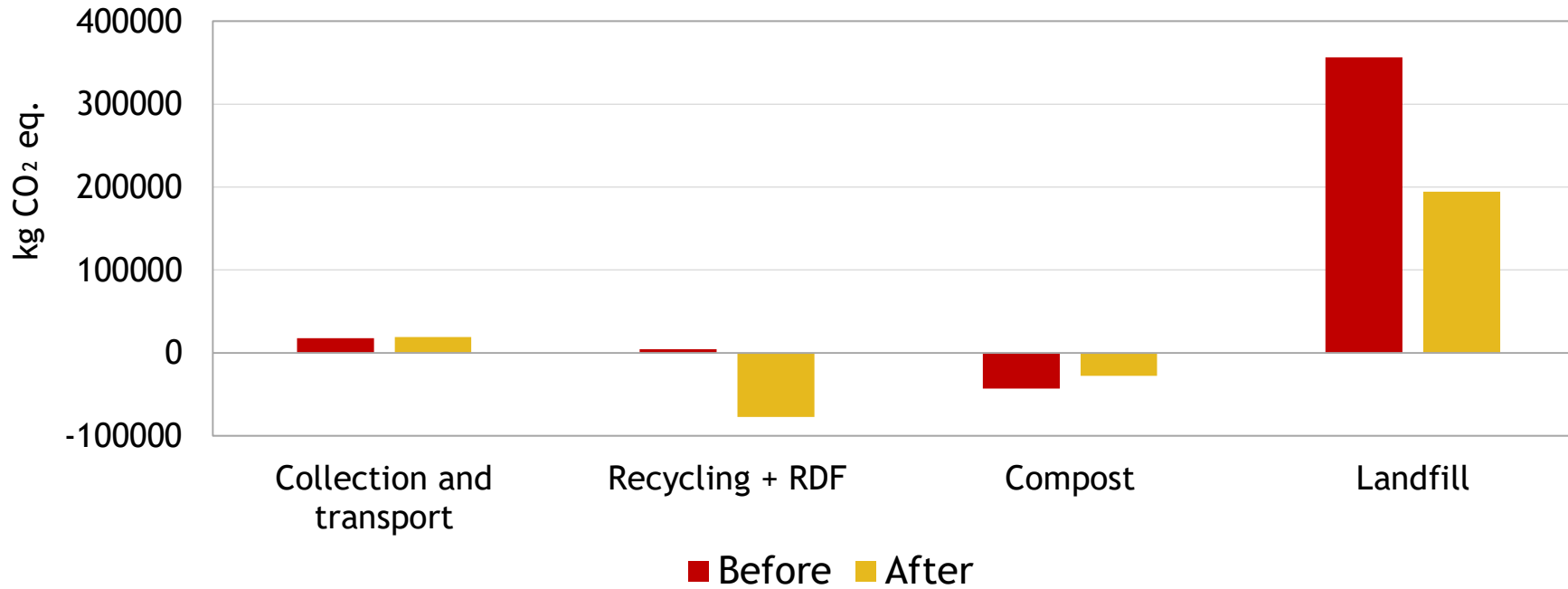


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Results: political overview

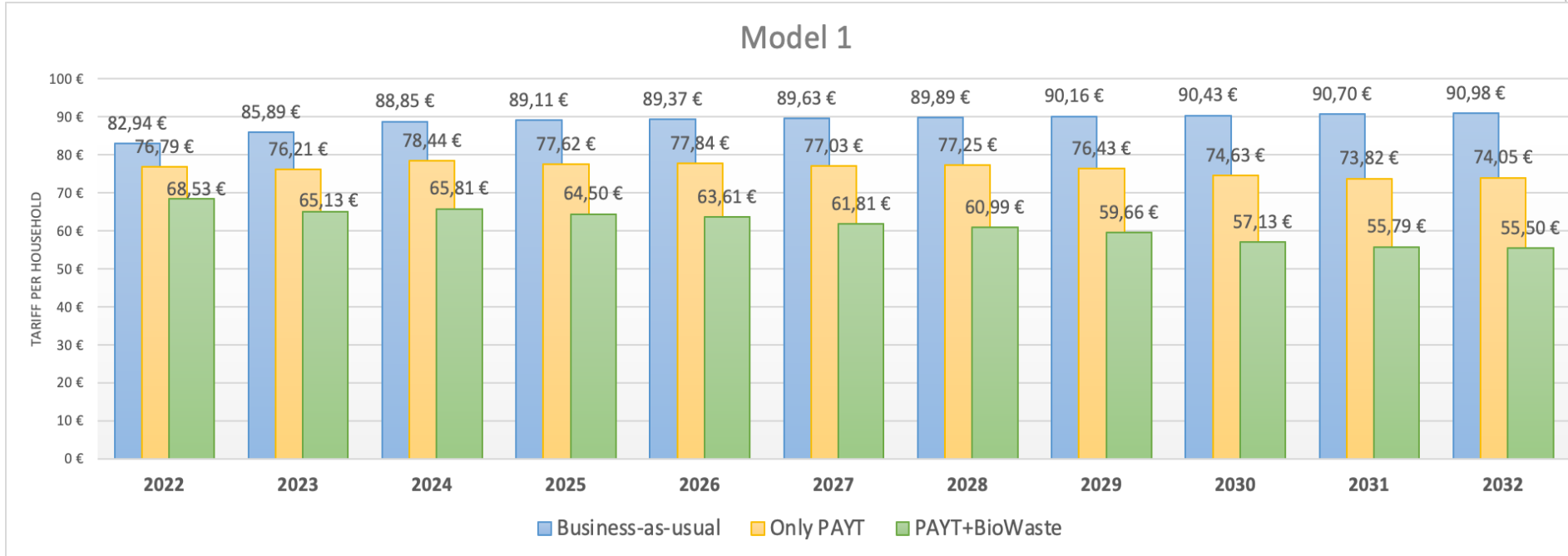
Location	Political acceptance	
Aveiro	 Fair	There is political interest for UBP waste tariffs, but the legal framework is still being developed.
Condeixa	 Good	The municipality developed a legal framework for UBP waste tariffs.
Lárnaka	 Fair	Political interest, but no legal support for UBP waste tariffs.
Lisboa	 Poor	There is no political interest in UBP waste tariffs, although legal support exists.
Vrilíssia	 Fair	There is still not a defined municipal tariff specific for waste management, but the municipality will provide discounts.

Results: carbon footprint



- ▶ Reduction in mixed municipal waste generation results in less environmental impacts: less pollutant emissions and less natural resources consumed.

Results: cost & benefits assessment



- ▶ Future regulatory implications: increased taxes, biowaste policy, makes PAYT more attractive than business-as-usual.
- ▶ Despite increased costs, the decrease in MW generated makes PAYT economically sustainable: the initial investment is recovered in 10 years.



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Conclusions and lessons learnt

- ▶ The **lack of legal support** for changing the tariff framework constitutes an important political barrier which surpasses the municipal scope. An effort for raising awareness at higher governance levels is recommended.
- ▶ All technically complex systems based on prototypes were prone to malfunctions and failures.
- ▶ A mature market for PAYT equipment does not exist yet within the countries involved. Equipment producers contacted lacked know-how, so they were required to develop prototypes which showed expectable flaws when tested on real conditions.
- ▶ On the other hand, this allowed the companies involved to gain a valuable experience for future initiatives.



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Conclusions and lessons learnt

- ▶ The most negative consequence with troublesome equipment was the demoralisation of the participant population in view of the problems: **political commitment** is necessary.
- ▶ Notwithstanding, the idea of PAYT was welcomed by population, since it is perceived as a fairer way to pay for waste management.
- ▶ A relative increase of the amounts of recyclable materials for separate collection was observed in almost all of the locations.
- ▶ There was a reduction in mixed MW and hence, in overall municipal waste generation, especially if DtD collection was put in place for households.
- ▶ This confirms the ability of PAYT schemes in diverting resources for recycling, with the subsequent environmental benefits associated to it.