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„Holistic approach to waste management in the transition to circular economy “

LIFE22-GIE-BG-LIFE HA2WASTE

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D2.7

PAPER ON ADDED VALUE OF PARMA EXPERIENCE

February 2024



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| Website | www.waste.pomorie.bg |

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Introduction

Project "Holistic approach to waste management in the transition to circular economy" (LIFE HA2WASTE) is a three-year project financed by LIFE Programme Environment (Nature & Circular Economy) of the EU and implemented on the territory of the town of Pomorie, Bulgaria.

The overall goal of the project is to develop, implement and promote a country-innovative holistic approach to waste management in municipality Pomorie in order to achieve the objectives of EC policy and legislation on circular economy and waste through the application of good European practices, particularly the practice of the city of Parma, Italy.

The specific objectives of the project are to:

- Increase the capacity to develop, apply and manage a new integrated waste management system
- Ensure software, technical and institutional infrastructure for collection of municipal waste
- Apply a new scheme for door-to-door collection of household waste and Pay-As-You-Throw (PAYT)
- Increase the knowledge and commitment of residents of municipality Pomorie to practice sustainable consumption, waste prevention and separate collection

The project includes implementation of 5 work packages:

WP1. Project management and coordination

WP2. Preparatory actions

WP3. Introduction of an innovative system for transition to circular waste management

WP4. Awareness raising and participation of local stakeholders

WP5. Sustainability, replication and use of project results

Project partners include:

| <i>Partner</i> | <i>Short name</i> | <i>Country</i> | <i>Role</i> |
|------------------------|-------------------|----------------|-------------|
| Municipality Pomorie | MunPOM | Bulgaria | coordinator |
| Club Ekonomika 2000 | CE2000 | Bulgaria | beneficiary |
| Theoremus AD | Theoremus | Bulgaria | beneficiary |
| Ecobulpack Bulgaria AD | Ecobulpack | Bulgaria | beneficiary |
| Zero Waste Italy | ZWItaly | Italy | beneficiary |

This document represents **Deliverable 2.7. Paper on added value of Parma experience**, produced within *WP2. Preparatory Actions, Task 2.2. Study tour in Parma, Italy*.

The objectives of WP2 are to enhance the capacity of project beneficiaries, obtain a complete and up-to-date information about the current situation of waste management in the Pomorie and to design a new waste management system to be implemented within the project. As the project aims to implement the practice of the city of Parma, Italy, a special task under WP2 is to study on the ground the consistent steps and actions that Parma municipality has taken to introduce door-to-door collection and PAYT, the problems encountered and how they have been overcome, the communication tools to engage the population and how the PAYT is currently running. A group from the Bulgarian project partners visited Parma in late November 2023. A report on the study tour was produced (D.2.4.)

The purpose of Deliverable 2.7 is to assess the added value of the Parma experience compared to other similar experiences and practices of EC municipalities, highlighting the advantages of replication of Parma experience, including in municipality Pomorie, tailored to its specific conditions.

The document has been developed based on quantitative and qualitative data gathered and site visits during the study tour in Parma and a review of good practices of EU municipalities, published on the website of Zero Waste Europe (<https://zerowasteurope.eu>).

The project team reviewed practices on door-to-door waste collection and PAYT of municipalities in EU countries to be compared with the experience of the city of Parma. It has been considered that a comparison between cities cannot be made, due to their different size, population, national regulations and the system, frequency of collection and types of streams of door-to-door collection. Therefore, the paper presents the added value of Parma experience comparing performance with similar cities in the same region Emilia Romagna, Italy.

1. Pre-PAYT Situation

The situation before the introduction of the PAYT

- *High waste generation*

In 2014, Emilia-Romagna, where Parma is located, was Italy's top waste producer, generating a staggering 636 kg per capita.

- *Stagnant recycling*

Separate waste collection stagnated around 45% for several years, indicating a lack of progress.

- *Low packaging recycling incomes*

Plastic, metals and glass were formerly collected together in one single stream. Quality and recyclability of packaging waste were poor and incomes coming from the national consortium of packaging producers CONAI were low.

Challenges

- *High disposal costs*

Traditional waste management methods were expensive, hindering progress on achieving waste targets.

- *Low citizen engagement*

Limited public participation in waste reduction and recycling efforts.

Inspiration from other European cities

Parma looked at successful PAYT implementations in other European cities to improve their system. Considering that the best performances in the introduction of door-to-door waste collection and PAYT were in Italy, namely Treviso, Trento and Capannori, those were taken as an inspiration model. These cities likely demonstrated:

- Increased recycling rates due to financial incentives
- Reduced waste generation due to citizens awareness

To name one as example, in 2007, Capannori became the first municipality in Italy to join the "Zero Waste" strategy and adopt zero waste goals at formal level by the city council. Since then, it has become a point of reference for waste management and the implementation of good environmental practices. For 10 years, Capannori reached 40%

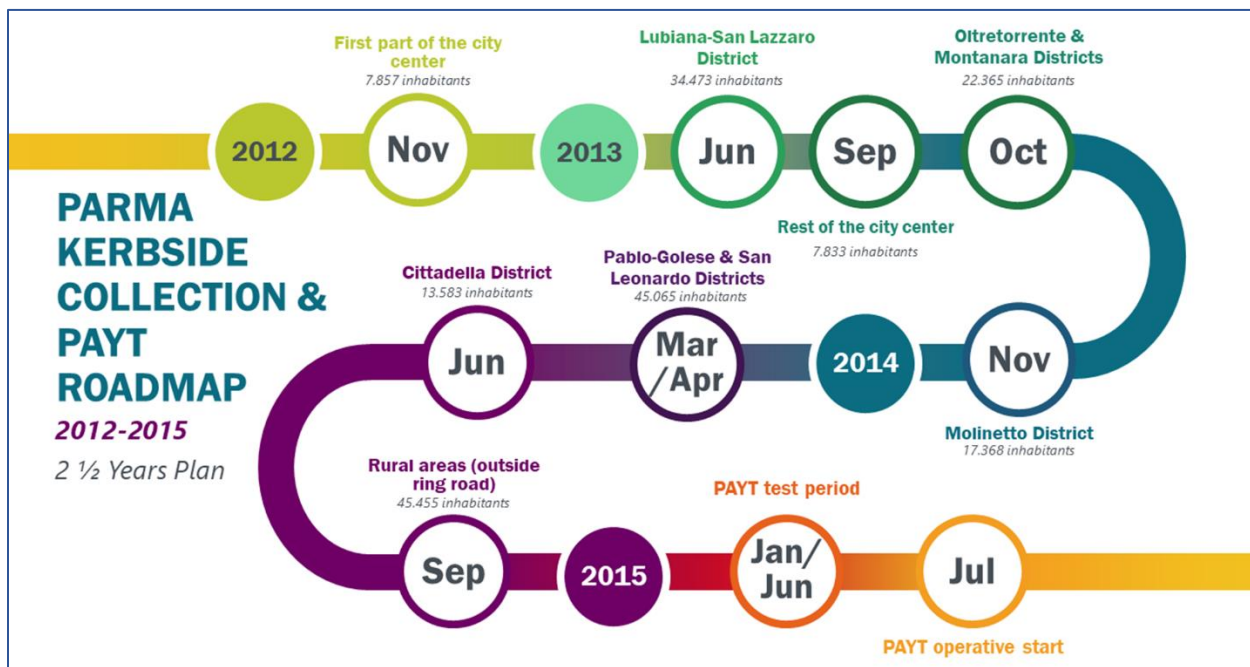
reduction of waste. The municipality achieved the highest separate collection rate of 86,50% by introducing the "door-to-door" collection and PAYT fee and taking numerous measures and initiatives to foster strong engagement of the residents.

2. PAYT Implementation

Door-to-door collection

Parma started to implement a separate waste collection system in 2013, focused on the separate collection of paper and cardboard, glass, plastic, metals and composites. The new collection system was implemented in various phases between June 2013 and September 2014. The Pay-As-You-Throw element was only implemented in July 2015.

Figure 1. Roadmap of Parma door-to-door collection and PAYT



In 2012, most households and businesses disposed of their mixed waste and recycling using road containers.

In 2013, the new system was launched and changes in the infrastructure for waste collection were made. This was done slowly, one city area at a time.

- Roadside containers were replaced with kerbside collections across the whole city.
- Roadside containers were kept for people to drop off only their glass and green waste.

- Each family received:
 - o a kitchen caddy and a free supply of compostable bags to separately sort food waste in their kitchen
 - o special bags for plastic, metals and tetrapack
 - o a paper and cardboard box (to be emptied into a building container)
 - o residual waste bin – residents were able to select the size of the residual bin (from 40 litres up to 240 litres)
- Buildings were given a bio-waste bin where residents could dispose of their separated food waste.
- Eco-Stations were installed in the city. They supplemented door-to-door collection, offering more flexibility for residents.
- Waste Collection Centres were organized where residents can bring separately collected waste free of charge.
- Large Public Awareness Campaigns were implemented to educate residents on proper waste sorting and the benefits of PAYT.

PAYT System

Following full roll-out of the door-to-door collection system, a PAYT scheme for residual waste has been introduced.

- *How does it work*

The “Meter” of the measurement is the bin for residual waste, which is assigned to each family. This is the actual measurement element. The container is equipped with a microchip that the operator reads at each emptying. The microchip works as a counter combined with its own identification barcode and records the number of times the container is emptied, or the bag collected.

- *How is calculated*

The waste fee (TARI) consists of a fixed part and a variable part. The fixed part is calculated based on the surface of the property. The variable part is calculated partly based on the number of household members and partly based on the number of emptyings/number of containers, provided for a minimum value determined by the normatively accepted tariffs of the municipality. The user is charged a set minimum number of emptyings of the residual waste fraction.

In summary, the user will be charged a minimum number of emptyings of the residual waste fraction. If the user does not exceed it, s/he will have obtained the maximum savings, otherwise the additional emptying will be charged in the first bill of the following year.

Costs

The investments for the eco-stations and waste collection centres were done by the municipality of Parma. In addition, the municipality invested in large information campaigns in the period of 2012–2015. Apart from those, the sub-contractor (Iren Ambiente) in charge of the waste management owns the waste management equipment, meaning operational costs and potential investments in equipment are directly made by the subcontractor. The sub-contractor charges the municipality based on the quantities of waste collected.

| | |
|--|------------|
| Capital costs for the collection infrastructure (bins, bags) | €375 000 |
| Capital costs for transportation (vans) | €125 000 |
| Annual operational costs for the collection handling (staff wages) | €8 600 000 |
| Annual operational costs for transport (fuel) | €1 100 000 |
| Additional costs (vans provided by cooperatives) | €3 100 000 |

Source: Zero Waste Europe

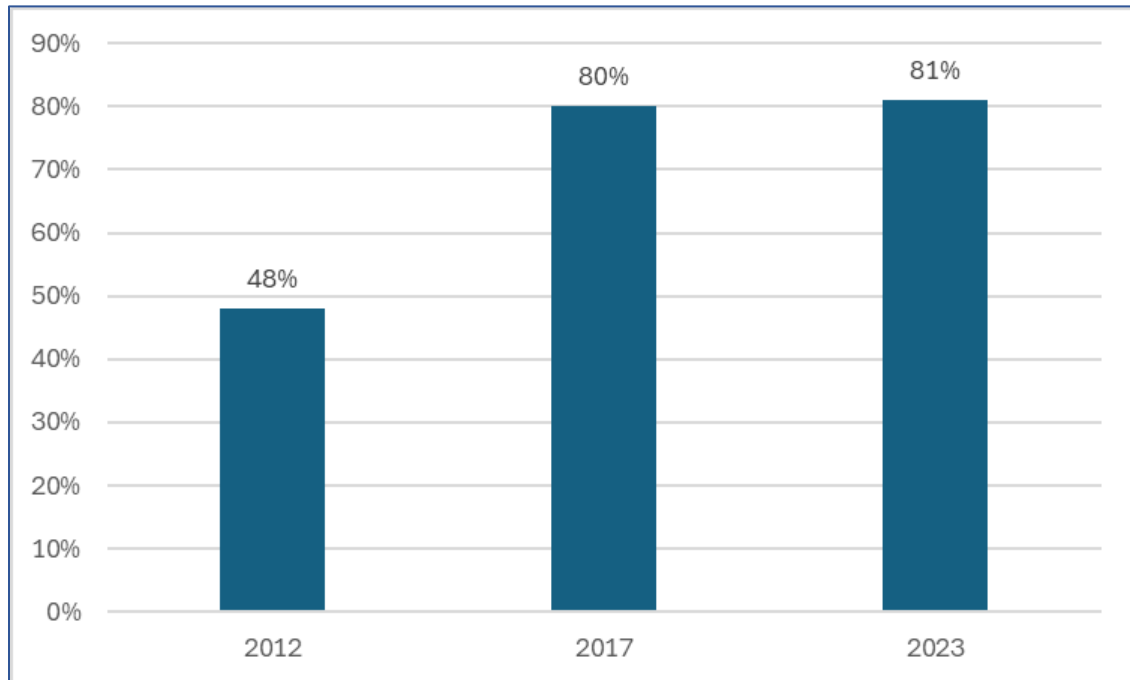
Revenues from material streams and incineration of residual waste are collected by Iren Ambiente, and partly transferred to the municipality. Revenues from the Extended Producer Responsibility scheme are collected by the municipality. The municipality collects the waste fee from residents.

3. Results and benefits

Significant Improvement

- Significant increase in the share of separately collected waste after the implementation of the new scheme - within four years, separate collection rates jumped from 48.5% to almost 80%.

Figure 2. Share of separately collected waste



- Reduction of the share of contaminated recyclable waste from **9% to 3%**
- Total waste generation decreased by **15%**, showing a positive shift in waste prevention habits.
- Residual waste requiring incineration dropped down by **59%**.

Economic benefits for the municipality

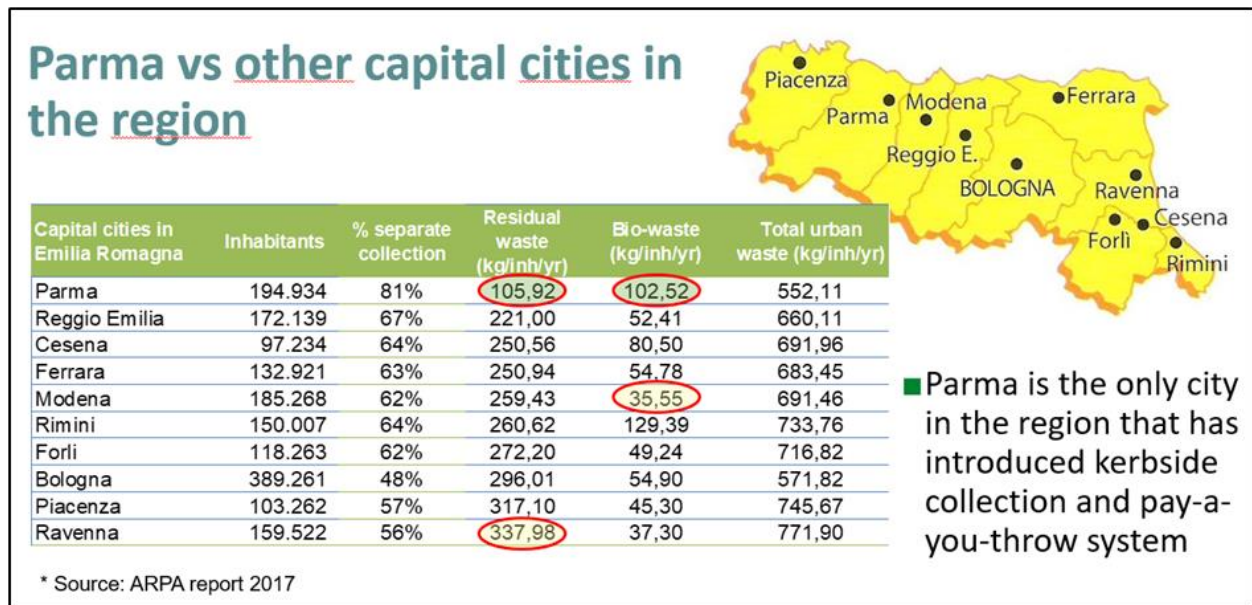
Due to less generated residual waste quantities and more separately collected recyclable waste, Parma has been able to decrease the operational costs per capita for both residual and recyclable waste.

Table 1. Revenues from recycled waste

| | | 2012 | | 2013 | | 2014 | |
|----------|-------------------------|--------|---------------------|------|---------------------|------|---------------------|
| euro/ton | | t/y | Total income (euro) | t/y | Total income (euro) | t/y | Total income (euro) |
| 16.91 | glass, plastics, metals | 12 563 | 212 488 | 4759 | 80486 | | |
| 32.71 | glass | | | 5953 | 195 021 | 8808 | 288 547 |
| 105.71 | plastics, metals | | | 4614 | 487 785 | 6912 | 730 669 |
| | | | 212 488 | | 763 292 | | 1 019 216 |

The comparison of Parma with other capital cities in region Emilia Romagna demonstrates the leading performance in Parma and the advantages of the applied kerbside collection and PAYT system.

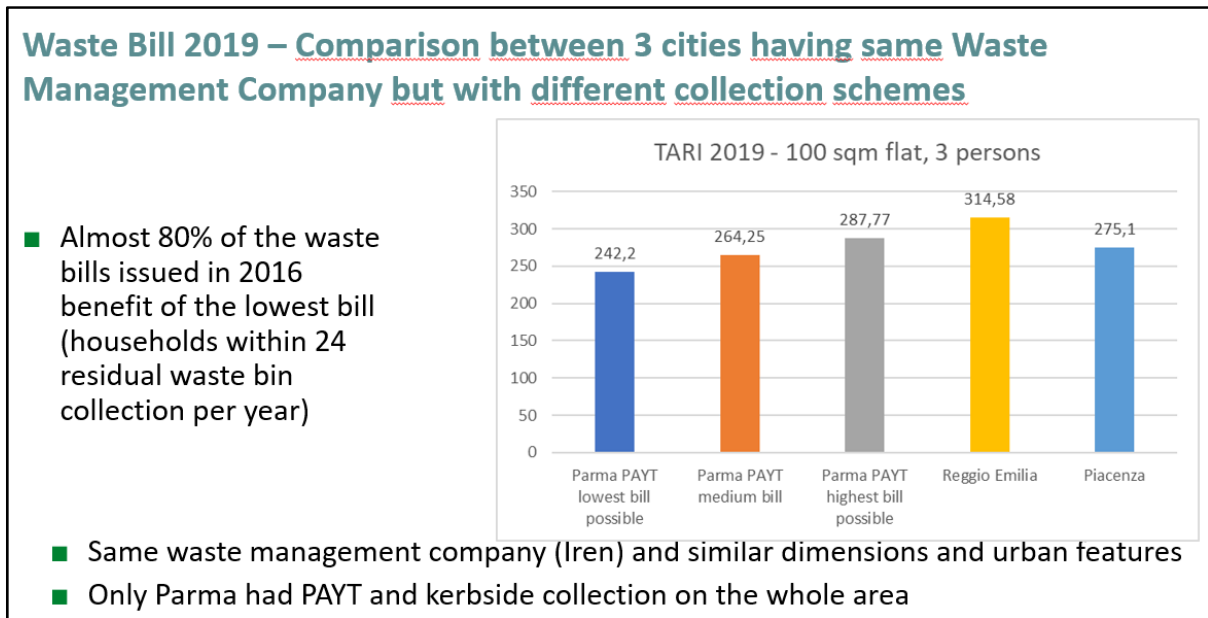
Figure 3. Comparison of performance of cities in Emilia Romagna, Italy



Economic benefits for residents

In the first three years the cost of waste and recycling services increased. This was due to additional costs for communication campaigns and equipment associated with rolling out the new system. Over time the cost has come down. In 2016 it returned to 2010 levels.

Figure 4. Waste bill – comparison between 3 cities



The Pay-As-You-Throw system has also several important environmental benefits. Less waste and greater recycling mean fewer waste goes to landfill, fewer natural resources are used, less energy is consumed, and less pollution is created, leading to saving GHG emissions.

4. Key conclusions of Parma experience

Parma's waste management system serves as a model for cities transitioning to a more sustainable future. The PAYT system, combined with additional measures, has improved recycling rates, reduced waste generation, and yielded significant cost savings.

Key conclusions of the practice of Parma and the achieved added value include:

- **Strong information system:** A strong information system to support the PAYT scheme should be put in place, including RFIDs on bins/bags and truck readers integrated with billing systems.
- **Trialling:** Start by testing the technology for the PAYT scheme well in advance. Parma spent 6 months checking that the RFID reading system worked before starting billing.
- **Strong investments in communications:** Parma invested heavily in providing information to residents about the new system, including why the system is introduced, how it works and what are the benefits, as well as educating them on proper sorting of waste.

- **Political will:** People will always complain at the beginning when services change. It's important to listen to them and to be accommodating where practical, but at the end it's important to stick with the decision to introduce envisaged changes.
- **Data management:** City officials should invest time in data management. Outlining the key performance indicators of the system, knowing who will have this data and requiring these actors to provide it on at least yearly basis should all be compulsory for cities serious about improving their waste management.
- **The amount of a municipality's waste budget does not immediately correlate with the performance of the system.** A city can have all the money needed, but without policies being properly designed and tailored to the local context and keeping flexibility in the system for future changes, then even a large budget is not guaranteed to deliver results. An excellent example for delivering outstanding results with a moderate budget is the small municipality Capannori in Italy.

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