Parma, Italy

Figure 1. Municipality of Parma. Map data: Google, Landsat / Copernicus.

This summary presents the main conclusions of one of the regional case studies conducted during the COLLECTORS project. The studies included a life cycle assessment, a cost-benefit assessment, and a circularity assessment. Social aspects were analysed on a general level based on information provided by the municipality and using focus group discussions in different European regions. References to original research reports are provided at the end of this document.

Description of the region

Parma is a city located in Northern Italy at the foot of the Apennines with ca. 194.000 inhabitants. On average, Parma has 660.000 tourist overnight stays per year. Well known for their food and quality of life, the region produced significant amounts of waste, 636 kg of waste per capita in 2014. This is roughly 150 kg above the Italian average, and 160 kg above the EU average. By that time, the region recycled 58.2% of the municipal waste, meaning that significant quantities were still sent to disposal, to be landfilled or incinerated. Fortunately, the situation is changing and Parma is leading the transition towards Zero Waste in the region.

PPW collection system

Parma started its zero-waste strategy by improving the separate collection of waste through door-to-door collection, introducing eco-stations and eco-wagons. Currently, the paper and packaging waste (PPW) collection in Parma can be described as PMD (plastic, metal and drink cartons) commingling method, meaning plastic, metal and composite material ("drinks cartons") are collected together. Paper and glass are separated separately. The residual waste, paper, and PMD are collected at the kerb, using home containers and bags. In addition, several bring points (glass) and eight eco-stations (automated CAS where citizens can bring all waste except residual) are available. By providing citizens ample and easy opportunities to separately discard their waste, Parma's performance rates have increased significantly during 2010-2016.

Parma's historical centre, food-scene and mountainous suburbs all pose various challenges regarding to the waste collection. In order to collect the waste as good and efficient as possible, Parma uses different collection zones, with different collection frequencies and pickup times. The map below shows the Parma region, with four different zones. For instance, the waste collection in the historical centre happens mainly in the evening to avoid blockage and nuisance.

Parma implemented a pay-as-you-throw (PAYT) system with a variable fee. Citizens pay the fixed fee (€ 244 for 3-person and 100m^2 household in 2017) and can collect eco-points; a discount on their waste bill for the following year. Eco-points are received for bringing e.g. electronic waste, hazardous waste and medical waste and depend on the quantity and sort waste. Disposing packaging waste is free, but yields no eco-points. Each eco-point is worth a discount of € 0.15, and citizens can receive a maximum discount of € 20.

Actions to improve collection

Until a few years ago, glass was collected co-mingled with lightweight packaging such as plastics and drinking composites; now, glass is collected separately, leading to a higher quality collected material and to lower contamination levels for both collected fractions.

In 2013, Parma started to implement a separate waste collection system focused on the separate collection of paper and cardboard; glass; and 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.

In the new collection system, the residual waste, paper and cardboard, glass, and PMD waste streams are collected at the kerb, using home containers and bags. For glass collection, 1.304 bell containers are available throughout the city. Parma has four civic amenity sites and thirteen automatic eco-stations where citizens can bring their (PPW) waste (ca. one bring point per 11.557

inhabitants). An important part of the new collection system are the new eco-stations bring points, implemented between 2015 and 2018.

The investments on the eco-stations were done by the municipality of Parma. In addition, Parma invested in large information campaigns in the period of 2012 – 2015. Apart from the eco-stations, a sub-contractor in charge of the waste management owns the waste management equipment, meaning operational costs and potential investments in equipment are directly made by the sub-contractor. The sub-contractor charges municipalities based on the quantities of waste collected. Revenues from material streams and incineration are collected by Iren Ambiente, and partly transferred to the municipality. Revenues from the EPR scheme are collected by the municipality. Lastly, the municipality collects the waste fee from the citizens.

Material flows in the region

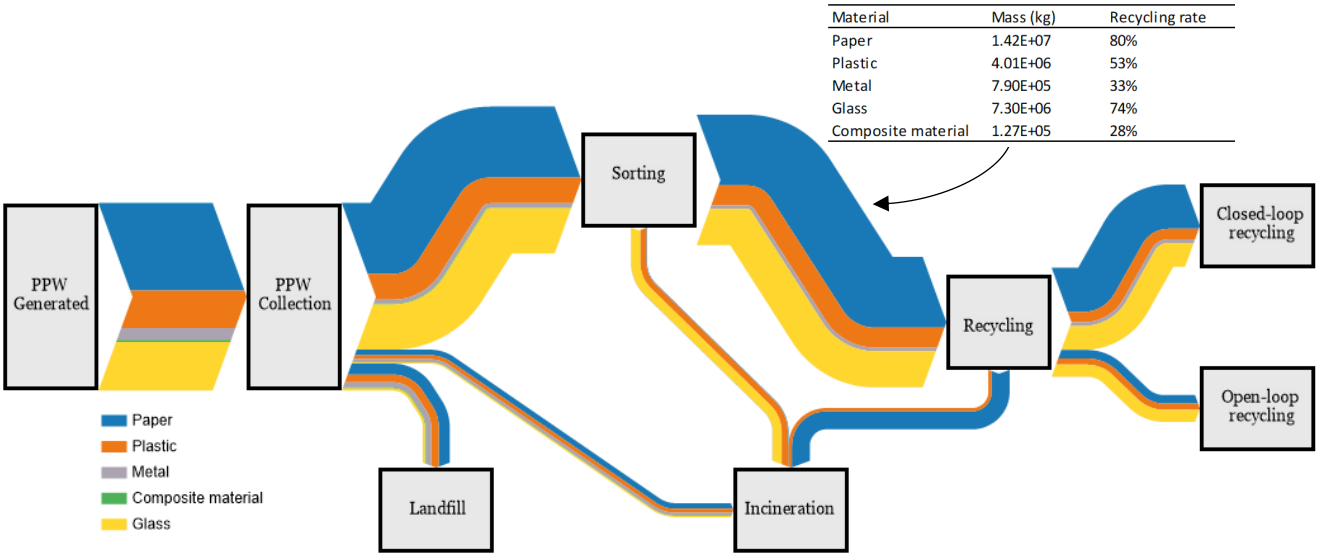

Figure 2 Material flows in the municipality of Parma (Source COLLECTORS D3.3)

The municipality of Parma (inhabitants and similar waste producers such as small commercial activities and public organisations) reported to have generated 17,679 tonnes of paper, 7,560 tonnes of plastic, 2,394 tonnes of metal, 9,807 tonnes of glass and 445 tonnes of composite material. Parma achieved a capture rate of 81%, 69%, 33% 93% and 36% for these materials respectively. 34% of the material that enters the residual waste is incinerated in Italy. Parma is currently meeting 2025 recycling targets of the European Union for paper, plastic and glass.

Findings from environmental assessment

The environmental impacts associated with the collection and sorting of the PPW accounted for only a small portion of the overall impact for each impact category. For instance, the global warming

potential (GWP) associated with collection and sorting for each material ranged from 0.5% (for paper in Rennes) to 4.0% (for the plastic in Parma).

In Parma, reducing capture losses had the largest effect on the environmental performance of the system compared to reducing sorting or recycling losses. All materials followed this trend, except for plastic, where it is shown that greater environmental impact reductions can be achieved by reducing losses at the sorting and recycling stages.

Reduced losses of paper at the recycling stage are associated with increased fossil resource depletion potential (FDP) and GWP. This is due to the fact paper is a renewable resource. Since less paper is incinerated if more is recycled, less conventional energy production is avoided (an effect that will become smaller as the energy system becomes more renewable).

The gross total shows how systemic improvements to the waste management, at all three stages (collection, sorting and recycling) can lead to relatively large improvements in Parma. For instance, a 10% improvement in each stage of management for each material will lead to an 8.7% improvement in the associated GWP of the system.

Findings from economic assessment

Since the beginning of the assessed period in 2012, Parma managed to improve their separate collection system by eventually even lowering the costs for its citizens. The total investment Parma made was in total € 2.4 million over the course of 2012-2018, which comes down to € 12.30 per inhabitant. During the implementation, the costs went up for a period of two years, only to come back down again in 2015. Comparing the waste fee in 2012 and 2016, we see a drop of 1.6%. Two possible explanations for the reduction in the waste fee are the foreseen producer fees that have been increasing from 2013 onwards; and the municipalities experience in the sharp decreasing in residual waste and the accompanied costs. Regarding how the PPW collection is funded in Parma, the most significant contribution (54%) is coming from the citizen waste fee; 24% comes from recovered materials; and 11% comes from the EPR fees. The rest is covered by incineration revenues and eco-tax benefits.

In order to present a quick overview of the projected shifting of incomes, the items below are listed as a percentage of the total revenues (% of the total revenues);

- the waste fee is decreasing from 56% in 2012 to 49% in 2021;
- the revenues form incineration decrease from 16% in 2012 to 6% in 2021;
- the recovered materials are increasing from 18% in 2012 to 26% in 2021;
- the EPR fee contribution increases from 8% in 2012 to 12% in 2021;
- and the eco-tax is increasing from 2% in 2012 to 7% in 2021.

Parma realised a drop in collected residual waste quantities of 62%, going from 52 kilotonnes in 2012 to 20 kilotonnes in 2017. A corresponding increase of 53% in collected recyclable PPW waste

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

Initiatives for citizen participation and social acceptance

In Parma, measures to involve citizens in the recycling system are mostly based on a strong communication. It especially revolved around the change of the system happening in 2012 and implementation of a pay-as-you-throw system. A strong communication campaign in public spaces, but also specifically targeting households affected by the change, was implemented. The system also takes into consideration the different needs considering the type of area in which citizens live or different organisations, such as schools, companies or retailers.

There has been a wide communication campaign launched when revamping the system. It did not consist only of public communication in streets but also of reaching citizens in their home to make sure they get the required information. Other initiatives included:

- Information about the sorting process is not only available through the hotline but also through email or a mobile application;
- A three years long contest between schools to reduce their waste;
- Mobile eco-points available for citizens in case the door-to-door system is not sufficient;
- Collection is adapted to different types of areas, organisations and family size.

For more information, please see

D2.4 Report on solutions for tackling systemic and technical boundary conditions. Available at: https://www.collectors2020.eu/results/analysis-of-boundary-condition/

D2.5 Report on implemented solutions and key elements in selected cases for societal acceptance. Available at: https://www.collectors2020.eu/wp-content/uploads/2020/06/Collectors-Deliverable2.5.pdf

D3.2 Report on the economic and financial performance of waste collection systems. Available at: https://www.collectors2020.eu/wp-content/uploads/2020/04/Deliverable3.2_COLLECTORS-project-1.pdf

D3.3 Report of recommendations for improvement of single systems and optimum operation conditions. Available at: https://www.collectors2020.eu/results/environmental-impact/

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