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ASSESSMENT

Waste Segregation and Recycling Programme

by Yerevan Municipality, 2020-2022

April 2023

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The EU granted project "Capital Cities Collaborating on Common Challenges in Hazardous Waste Management - Yerevan, Warsaw, Tirana" is referred to in working terms by using the abbreviation "HWM project".

Introduction

The assessment was prepared in April 2023 to provide the key information, observations and recommendations related to the Waste Segregation and Recycling Programme introduced by the Yerevan Municipality in 2020. This assessment report was prepared based on the information obtained from the Yerevan Municipality Greening Company (CNCO) for 2020-2022.

Any observations and recommendations in this report were developed by the HWM Project Team and do not necessarily represent the official views of the Yerevan Municipality or the European Union.

Main Findings

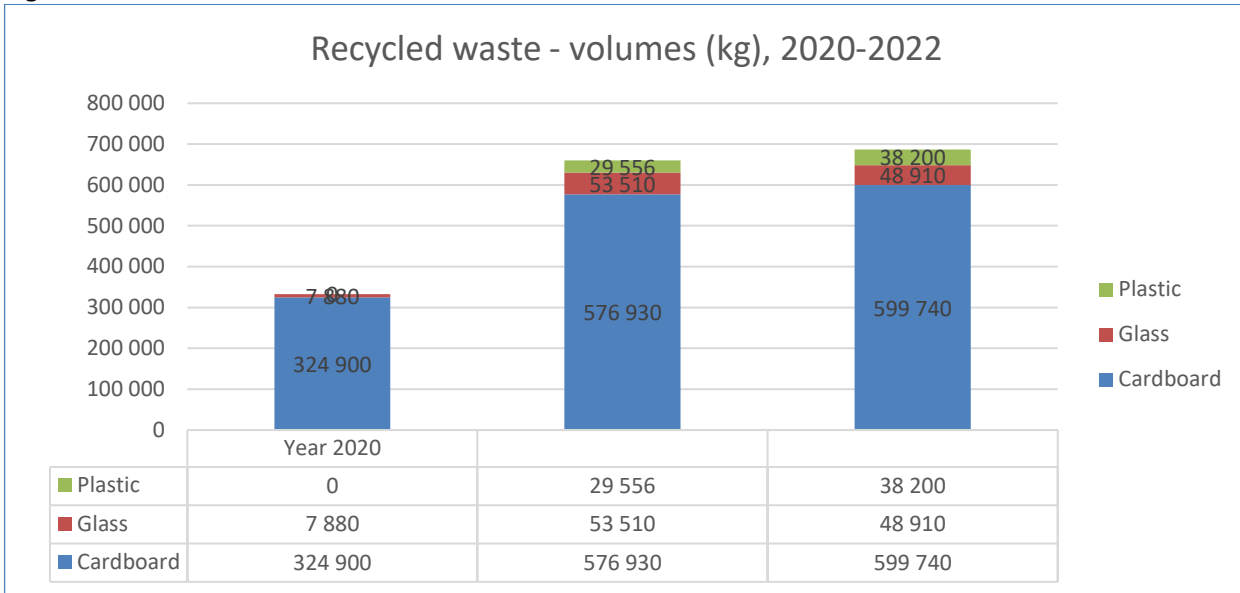
1. Recycled waste volumes and values

The categories of recycled waste were cardboard/paper, glass, and plastic (plastic sold to recyclers since January 2021).

In terms of volumes and values of the recycling waste, the following observations were made:

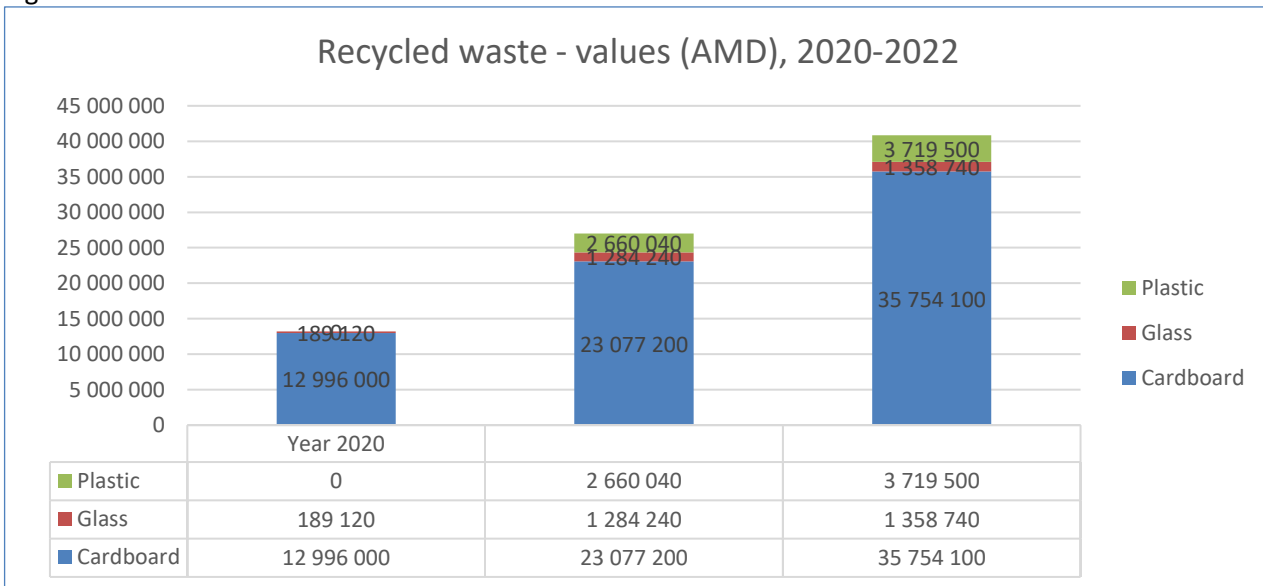
- In 2020, some 333 tonnes were given to recycling, increasing to 660 tonnes in 2021 and to 687 tonnes in 2022, with 87% of the total volume made up of cardboard, 7% glass, and 6% plastic (2022).
- The overall increase of volumes in 2020-2021 (100% in 2020) was by 98% and in 2020-2022 it was by 106%, with high dynamics for all types of recyclables. As the waste plastic was collected only starting from 2021, the increase noted in 2021-2022 was by 27%.
- The volumes of recycled cardboard increased gradually during the period and high levels were maintained throughout the second half of 2021, followed by further moderate growth in 2022. The volumes of recycled glass increased until March 2021 and then unevenly decreased until the end of 2021 with the main reason behind this trend being the missing containers, possibly stolen for private use (the containers were small size, convenient for home or small commercial use) with this somewhat negative trend continued in 2022 (in 2022 the volumes of recycled glass were some 8% smaller compared to 2021). The volumes of recycled plastic were gradually but unevenly growing throughout 2021 and the positive trend continued in 2022.
- Similarly, the incomes from selling recyclable waste increased significantly when comparing 2020 (100%) and 2021: for cardboard – 178%, glass – 679%, and in total 205%. In 2021, the total income reached 27 million AMD. In 2022, further growth of incomes was noted – compared to 2021 (100%) it was: for cardboard – 155%, for glass – 106%, for plastic – 140%, and in total – 151%. In 2022, the total income was almost 41 million AMD.

Figure 1



Source: Own elaboration based on data from the YM Greening Company

Figure 2



Source: Own elaboration based on data from the YM Greening Company

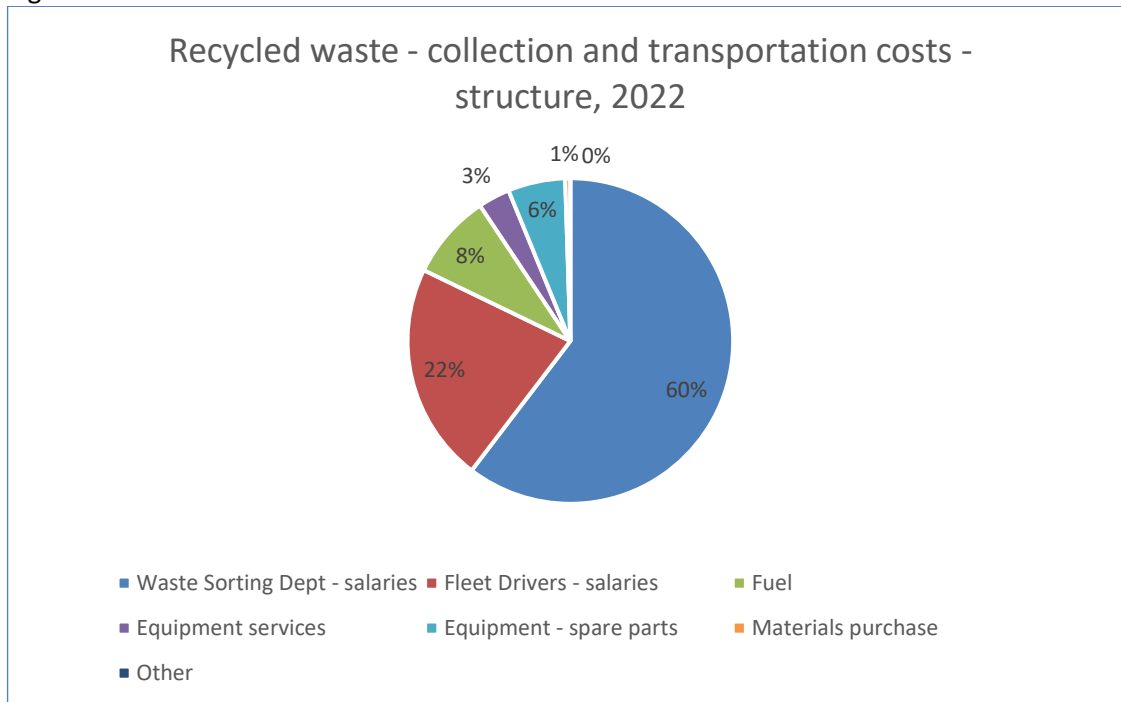
2. Recycled waste collection and transportation costs

The Waste Segregation and Recycling Programme required certain operational costs and investments. The latter ones were not the subject of this assessment.

As regards the operational costs, the main element was the salaries of the technical staff of the Waste Sorting Department of the Yerevan Municipality Greening Company and of the fleet drivers, followed by fuel costs, services, spare parts and other materials. The following observations were made in relation to the operational costs of the Programme:

- The costs increased in 2020-2022 as a result of the expansion of the Waste Segregation and Recycling Programme (more types of waste, greater volumes), totalling some 116 million AMD in 2022, with a monthly average of some 9.7 million AMD. In 2022, the total costs stood at 109% of the 2021 figure. A relatively high increase in nominal terms and percentage-wise was noted for the cost of salaries of the fleet drivers which doubled between 2020 and 2021, then stabilised in 2022. There was a significant increase of the costs of spare parts against a drop in the costs of equipment services in 2022.
- In 2022, the cost structure was comparable to that of 2021 (in 2022: costs of Waste Sorting Dept staff - 60% of the total, fleet drivers - 22%, and fuel – 8%).

Figure 3



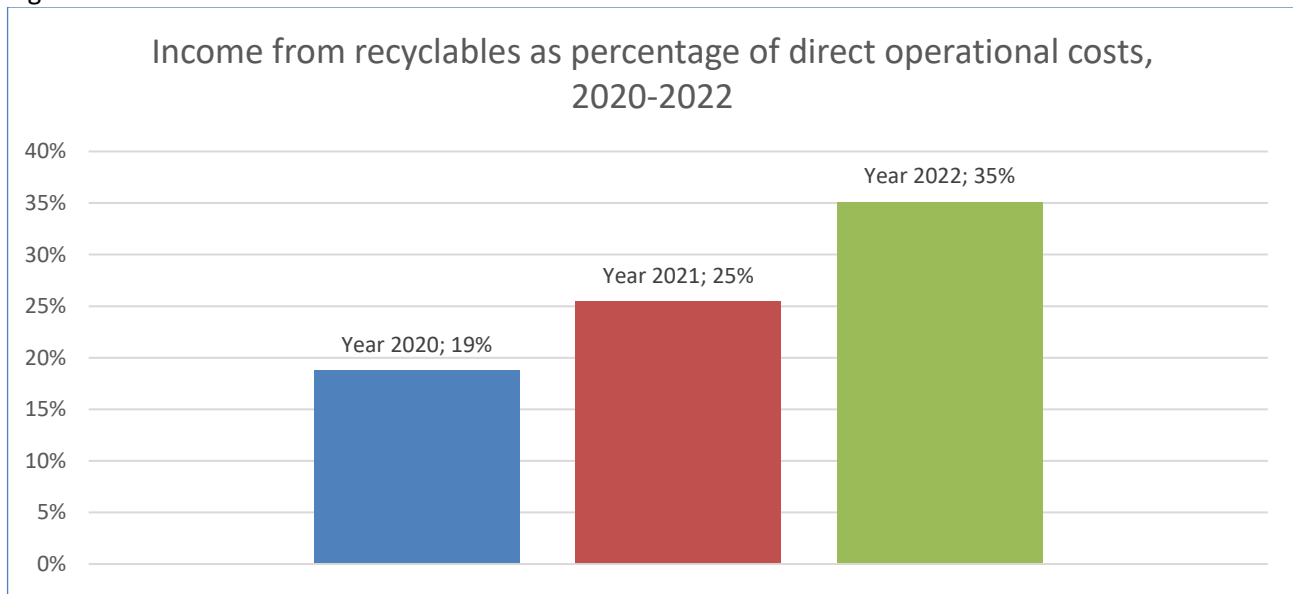
Source: Own elaboration based on data from the YM Greening Company

3. Operational sustainability

In terms of operational financial results, the incomes generated by the Waste Segregation and Recycling Programme compared to operating costs stood at 19% in 2020, 25% in 2021, and 35% in 2022, showing a remarkable and steady increase because of the significant increases of recycled volumes and unit income per kilo of recycled waste combined with a moderate increase of the operational costs.

At this point, the Programme is not considered financially sustainable yet, however, the situation showed a significant improvement with the increase in volumes and values of recycled waste between 2020 and 2022.

Figure 4



Source: Own elaboration based on data from the YM Greening Company

Recommendations

The following recommendations are made for the Waste Segregation and Recycling Programme by the Yerevan Municipality, both of strategic and operational relevance:

Operations:

1. **By increasing the volumes and thus the values of recycled waste, the Waste Segregation and Recycling Programme can become operationally sustainable.** With the investment funded by the EU under the "Capital Cities Collaborating on Common Challenges in Hazardous Waste Management - Yerevan, Warsaw, Tirana" Project, the Programme will have 3 times more selective waste collection points (paper, plastic, glass, and aluminium) before the end of this year, with at least 300 points in operation. This will mean a significant increase in the volumes and values of recyclables managed. The initial estimate is that some 2,374 tonnes of recyclables will be sold in 2024 (687 in 2022), with income in constant prices (2022) reaching some 149 million AMD (41 million AMD in 2022). The costs of operations are expected to increase to some 150 million AMD in 2024, also in constant prices. It is thus expected,

that the full operational sustainability can be reached in 2024. And it can further improve in the following years, especially with future investments.

2. The collection of some 2734 tonnes of recyclables in 2024 will correspond to over 6% of total municipal waste generated (in 2021 it was approximately 373 kg per capita and 413,100 tonnes in total). This is consistent with the earlier estimations (2022) that **recycling more than 5% of municipal waste was expected to make the operations of the Waste Segregation and Recycling Programme in Yerevan financially sustainable with incomes exceeding the operating costs. Currently, only some 0.17% of municipal waste is directly recycled under the Programme (2021-2022).**
3. Further economies of scale are expected in relation to the efficiency and costs of operations of the Programme when it is expanded further in the coming years, as reorganisation and larger scales of logistics (routes, schedules, frequency of collection, 'fuller' bins, etc.) and other organisational issues (work organisation, specialisation, etc.) will allow more efficient use of resources of the Programme.
4. **A careful examination and coordination between the operations of the two municipal companies engaged by the Yerevan Municipality in waste management (Greening Company and Public Utilities Company) are required to adjust the locations, numbers and capacities of containers used for the collection of recyclable waste and mixed (general) waste.** Such analyses should be conducted continuously as the Waste Segregation and Recycling Programme is expanded.

Strategic considerations:

1. As stated before, currently, only 0.17% of municipal waste in Yerevan is recycled under the Waste Segregation and Recycling Programme. Additionally, some more waste is recycled by other entities as well as informally, however, any such actions do not generate significant amounts of waste for recycling. In practical terms, there are no limitations to increasing the volumes of recycled waste in Yerevan apart from the need to finance the relevant investments and to provide wider opportunities and awareness to citizens and local businesses to participate in waste segregation.
2. Considering the possibility of having more than 50% of all municipal waste recycled (the current EU objectives are to recycle at least 65% of municipal waste by 2035), **the Programme expansion in Yerevan is both guaranteed and necessary.**
3. This assessment is limited to the direct operational aspects and the financial side of the Waste Segregation and Recycling Programme. However, considering the negative economic, environmental and social costs of landfilling mixed municipal waste, especially the related Green House Gas emissions, and water and soil contamination, as well as the necessity of building climate change resilience and preventing degradation of the natural environment, **Yerevan Municipality should elaborate and implement a vigorous, long-term strategy to rapidly expand its Waste Segregation and Recycling Programme and seek the necessary finance.**
4. The expansion of the Waste Segregation and Recycling Programme will find broad support and attract funding from the national budget as well as from donors and international financial institutions. Some relevant considerations are expected to be made in relation to the current Yerevan landfill construction project by the EU and EBRD (under revision now).

5. Considering the fact that the population's perceptions gradually shift towards environment- and climate-friendly behaviours and policies, the Waste Segregation and Recycling Programme expansion shall meet with popular social and political support.

The above findings and recommendations are consistent with investment recommendations provided to the Yerevan Municipality by the HWM project earlier in 2022 and the subsequent investment into waste collection trucks and containers carried out this year.

Annex

Operational data for 2020-2022 (separate file).