# Sid Model Report

February 2024

Project for Capacity Development of Solid Waste Management
in the Republic of Serbia

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# List of Abbreviations

| | |
|---|---|
| A/P | Action Plan |
| AP-V | Autonomous Province of Vojvodina |
| CA | Collection Area |
| C&D | Construction and Demolition |
| C/P | Counterpart |
| CT | Compactor Truck |
| CTTS | Compactor Truck Transfer Station |
| DS | Disposal Site |
| EISP | Environmental Infrastructure Support Program |
| GIS | Geographic Information System |
| GPS | Global Positioning System |
| GS | Generation Source |
| GW | Green waste |
| HH | Houshold |
| HHW | Household waste |
| HMSW | Hazardous municipal solid waste |
| IPA | Instrument for Pre-Accession Assistance |
| JET | JICA Expert Team |
| JICA | Japan International Cooperation Agency |
| LW | Landfilled waste (waste to be landfilled) |
| LWMP | Local Waste Management Plan |
| MEP | Ministry of Environmental Protection |
| MRF | Material Recovery Facility |
| MSW | Municipal Solid Waste |
| NWMP | National Waste Management Program |
| PC | Private Company |
| PET | Polyethylene terephthalate |
| POS | Public Opinion Survey |
| PP | Pilot Project |
| PUC | Public Utility Company Standard Sid |
| PW | Pruning waste |
| RI | Recycle Island |
| RLF | Regional Landfill |

| | |
|---|---|
| RMRF | Regional material recovery facility |
| RSD | Serbian dinar |
| RW | Recycled waste |
| RWMC | Regional Waste Management Center |
| RWMS | Regional Waste Management System |
| RY | Recycling Yard |
| SL | Skip Loader |
| SW | Specific waste |
| SWM | Solid Waste Management |
| T&M | Time and Motion |
| TS | Transfer station |
| TT | Truck-with-Trailer |
| TTTS | Truck-with-Trailer Transfer Station |
| VAT | Value Added Tax |
| WACS | Waste Amount and Composition Survey |
| WB | Weighbridge |
| WEEE | Waste Electrical and Electronic Equipment |

# Preface

This report is compiled for the Sid Model that has been developed under the “Project for Capacity Development of Solid Waste Management” (the Project), to be disseminated by Ministry of Environmental Protection (MEP), the provincial secretariat for environmental protection, Autonomous Province of Vojvodina, Sid Municipality and PUC Standard Sid.
Sid Model is defined as a methodology that represents "lessons learnt from the steps that the Project has taken and that can be utilized to accelerate participation of small- and medium-size municipalities to regional waste management system (RWMS) promoted by MEP.
The report starts with a summary of the Waste Management Program and a report on the current status of RWMS, which were presented at the Project’s Seminar on Sid Model held on 19 February, 2024. Following the brief explanation of the Project, the Sid Model is explained in five sections. Each section is titled as a “Step”, indicating the steps in the process of formulating a master plan of solid waste management for a municipality. In each step, several modules to be used to solve an issue that a municipality would be faced with are explained, based on the experiences gained in Sid Municipality through the implementation of the Project activities
In the section “Definition of Sid Model” (page 21), common issues that municipalities would have are listed (in the “What You’d Like to Do/Know” column) in a table with indication of a module which may be useful. However, it is highly recommended that a municipality would check its own status with reference to the table from Step 1 to see if the issue(s) listed in each Step are already cleared in the municipality. If any issues relevant to the municipality are left unsolved, what the municipality would need to start with will be the modules that are indicated there.

# National waste management program and the current status of the regional waste management system in Serbia

## 1 Waste Management Program in the Republic of Serbia for the Period 2022 –2031

- As part of the EU accession negotiations, the Republic of Serbia, through Chapter 27, has begun the process of establishing a waste management system and adapting it to the goals and acquis of the EU.
- The program was prepared in accordance with the Law on the Planning System of the Republic of Serbia, the Law on Waste Management (Official Gazette of the RS, No. 36/09, 88/10, 14/16 and 95/18 - other laws) and accompanying by-laws
- The program establishes strategic goals for the improvement of the waste management system and the basic principles that should guide all actors in waste management to achieve those goals in the Republic of Serbia for the period 2022-2031.
- The implementation of this program, in addition to reducing the harmful impact on the environment and climate change, should enable the realization of the prerequisites for the use of waste in the circular economy, the development of which goals and measures are determined in a special program.

## 2 Overall goals

- The overall goal is to develop a sustainable waste management system in order to preserve resources and reduce negative impacts on the environment, human health and spatial degradation. This includes: prevention of waste generation, reduction of the amount of recyclable waste disposed of in landfills, reduction of the share of biodegradable waste in disposed municipal waste, reduction of the negative impact of disposed waste on the environment, climate and human health and management of generated waste according to the principles of circular economy.
- The achieved progress in terms of achieving the overall goal of the Program will be monitored through the following indicators :
  1) the degree of municipal waste that is disposed of in unsanitary landfills in relation to the total amount of generated municipal waste (%);
  2) degree of disposal of hazardous waste (%).

## 3 Special objectives

- To achieve the overall goal of the Program, the following special objectives are established :
- Special objective 1: Improved municipal waste management system through increased recycling rate, reduced disposal of biodegradable waste in landfills and reduced disposal of waste in unsanitary landfills
- Special objective 2: Established system of sustainable management of hazardous and industrial waste
- Special objective 3: Increased rate of collection, reuse and recycling of specific waste streams and more efficient use of resources
- Special objective 4. Strengthened capacity of institutions in the field of waste management and harmonized regulation with EU regulations

## 4 Regional approach

- At the strategic and investment level, the Republic of Serbia relies on the option of regional waste management.
- The program provides guidelines for the establishment of these regions, but the choice of which region to join remains the decision of each local self-government;
- The infrastructure required for the establishment of a fully functional regional municipal waste management system in accordance with the mentioned EU directives is divided into three phases.

**Table 1 Infrastructure planned for municipal waste management**

<table>
<tr><td></td><td>High density population, major cities - Belgrade</td><td>Regions with large settlements – Novi Sad, Nis, Kragujevac</td><td>Other regions</td></tr>
<tr><td>Phase 1</td><td colspan="3"><ul><li>Waste collection and transport equipment to ensure 100% service coverage</li><li>Transfer stations (where applicable)</li><li>Primary separation of recycled material (initially two-bin system, with the prospect of further development)</li><li>Secondary separation at the regional level</li><li>Home composting (30%)</li><li>Primary separation of green waste and local composting level</li><li>Waste collection centers (bulky waste, electrical waste electronic equipment, waste oil, hazardous household waste)</li><li>Landfills that fully meet the engineering requirements and technological standards</li><li>Closure of existing landfills (cessation of operation, establishment of controlled entrance and fencing)</li><li>Monitoring and reporting equipment</li></ul></td></tr>
<tr><td>Phase 2</td><td>Converting waste to energy<br>Further development of primary separation<br>Home composting volume increase</td><td>RDF production<br>Home composting volume increase</td><td>Further development of primary separation<br>Home composting volume increasing<br>Separate collection and biological treatment of waste</td></tr>
<tr><td>Phase 3</td><td colspan="3">Further separate collection and biological treatment of biodegradable waste<br>Home composting volume increasing<br>Reclamation of closed unsanitary landfills</td></tr>
</table>

## 4.1 Regions for waste management in the Republic of Serbia

**Table 2 List of 26 Regions**

| In Serbia | Waste Management Region | Municipalities |
|---|---|---|
| Сремска Митровица | Sremska Mitrovica | Bogatic, Ruma, Sremska Mitrovica, Sabac, Sid |
| Панчево | Pancevo | Kovin, Kovacica, Opovo, Pancevo. |
| Инђија | Indjija | Indjija, Irig, Pecinci, Sremski Karlovci, Stara Pazova. |
| Ужице | Uzice | Arilje, Bajina Basta, Cacak, Cajetina, Ivanjica, Kosjeric, Lucani, Pozega, Uzice. |
| Пирот | Pirot | Babusnica, Bela Palanka, Dimitrovgrad, Pirot. |
| Кикинда | Kikinda | Ada, Becej, Kikinda, Nova Crnja, Novi Becej. |
| Лапово | Lapovo | Despotovac, Lapovo, Raca, Svilajnac. |
| Јагодина | Jagodina | Cuprija, Jagodina, Paraćin, Smederevska Palanka, Velika, Plana. |
| Лесковац | Leskovac | Bojnik, Crna Trava, Lebane, Leskovac, Medvedja, Vladicin Han, Vlasotince |
| Суботица | Subotica | Bačka Topola, Čoka, Kanjiža, Mali Iđoš, Novi Kneževac, Senta, Subotica |
| Ваљево | Valjevo | Barajevo, Koceljeva, Lajkovac, Lazarevac, Ljig, Mionica, Obrenovac, Osecina, Ub, Valjevo, Vladimirci, Krupanj, Loznica, Mai Zvornik, Ljubovija. |
| Зрењанин | Zrenjanin | Secanj, Titel, Zitiste, Zrenjanin. |
| Нова Варош | Nova Varos | Nova Varos, Priboj, Prijepolje, Sjenica. |
| Врање | Vranje | Bosilegrad, Bujanovac, Presevo, Surdulica, Trgoviste, Vranje |
| Београд | Belgrade | Cukarica, Grocka, Mladenovac, New Belgrade, Palilula, Rakovica, Savski venac, Sopot, Stari Grad, Surcin, Vozdovac, Vracar, Zemun, Zvezdara. |
| Нови Сад | Novi Sad | Backa Palanka, Backi Petrovac, Beocin, Novi Sad, Srbobran, Temerin, Vrbas, Zabalj |
| Ниш | Nis | Aleksinac, Gadzin Han, Kursumlija, Doljevac, Zitoradja, Merosina, Nis, Prokuplje, Razanj, Sokobanja, Svrljig |
| Сомбор | Sombor | Apatin, Bac, Kula, Odzaci, Sombor. |
| Врсац | Vrsac | Alibunar, Bela Crkva, Plandiste, Vrsac. |
| Зајечар | Zajecar | Boljevac, Bor, Kladovo, Knjaževac, Majdanpek, Negotin, Zaječar. |
| Смедерево | Smederevo | Golubac, Smederevo, Veliko Gradiste. |
| Крагујевац | Kragujevac | Arandjelovac, Batocna, Gornji Milanovac, Knić, Kragujevac, Topola, Rekovac |
| Краљево | Kraljevo | Kraljevo, Vrnjacka Banja, Trstenik |
| Рашка | Raska | Novi Pazar, Raska, Tutin |
| Крушевац | Krusevac | Aleksandrovac, Brus, Ćićevac, Kruševac, Varvarin, Blace |
| Пожаревац | Pozarevac | Kucevo, Malo Crniće, Petrovac, Požarevac, Žabari, Žagubica |

Out of the 26 regions for waste management as foreseen by the measures from the Strategy, regional companies for waste management have been established in 13 regions, and another 12

regions have signed inter-municipal agreements, but no regional companies have been established in them yet.


**Figure 1 Twenty-six (26) Waste Management Regions in Serbia**

## 4.2 Regional Center for Waste Management

| Regional approach | Regional center | Processing/disposal |
|---|---|---|
| ▯ several municipalities dispose of waste in the regional center for waste management<br>▯ for example, the municipalities of the Subotica region are: Bačka Topola, Čoka, Kanjiža, Mali Iđoš, Novi Kneževac, Senta, Subotica | ▯ separation of recyclable material<br>▯ treatment of biodegradable waste<br>▯ treatment of construction and demolition waste<br>▯ wastewater treatment<br>▯ sanitary landfill | ▯ secondary raw materials (metal, plastic, glass, paper and cardboard) are sent for further processing<br>▯ RDF is incinerated<br>▯ the residue is landfilled in a sanitary landfill |

**Figure 2 Role of Regional Center**

**Figure 3 Some Images of Regional Center**

## 5 Program Measures for Achieving Goals

- Special objective 1: Improved municipal waste management system through increased recycling rate, reduced disposal of biodegradable waste in landfills and reduced disposal of waste in unsanitary landfills
    - Measure 1.2. Improvement of the system for separate collection and recycling of municipal waste
    - Measure 1.3. Establishment of separate collection of biodegradable waste in order to reduce its disposal in landfills
    - Measure 1.4. Establishment of new regional centers with sanitary landfills
    - Measure 1.5. Introduction of economic instruments to encourage changes in the municipal waste management sector

- Measure 1.6. Closure and rehabilitation of existing unsanitary municipal waste landfills

## 6 Sanitary landfills

In accordance with EU standards, by the end of 2021 a total of ten regional sanitary landfills and two more that are not of the regional type have been built.

Sanitary landfills in operation are as follows:

1) Regional sanitary landfill "Duboko" Užice;
2) Regional sanitary landfill "Vrbak" Lapovo;
3) Kikinda regional sanitary landfill;
4) Regional sanitary landfill "Gigoš" Jagodina;
5) Regional sanitary landfill "Željkovac - Deponija dva" Leskovac;
6) Regional sanitary landfill "Muntina padina" Pirot;
7) Regional sanitary landfill "Jarak" Sremska Mitrovica;
8) Regional sanitary landfill Pancevo;
9) Regional sanitary landfill Subotica;
10) Regional sanitary landfill "Vinča" Belgrade;
11) Sanitary landfill "Meteris" Vranje;
12) Sanitary landfill "Vujan" Gornji Milanovac.

## 7 Ongoing activities and built centers

- Completion of the plant in the Belgrade-Vinca region
- Realization of construction projects of Regional Centers Kalenić, Nova Varoš, Sombor, Pirot, Sremska Mitrovica - EBRD
- Construction projects of Regional Centers Kraljevo, Pančevo, Niš and Kragujevac - MGSI
- The center of Subotica is completed;

## Table 3 Infrastructure for Regional Municipal Waste Management

| No | Region | Cities and municipalities of the region | Sanitary landfill (includes waste transfer station if no landfill is provided) | Primary and secondary (bins/containers and vehicles) separation of recycling material (secondary separation line) | Household composting (composters or bags) primary separation (vehicles) of green waste and local composting (machines) | RECYCLING YARDS / waste collection centers (bulky waste, WEE, waste oil, HMW) | Production of RDF / separate collection and biological treatment of biodegradable waste / Conversion of waste into energy | Recultivation of closed unsanitary landfills (required in all municipalities of the regions) | C&D waste treatment |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Subotica | Bačka Topola, Čoka, Kanjiža, Mali Iđoš, Novi Kneževac, Senta, Subotica | IPA2012 | IPA2012 | IPA2012 | IPA2012 | IPA2012 | Partial | In preparation |
| 2 | Sombor | Apatin, Bač, Kula, Odžaci, Sombor | EBRD/AfD | Partial, EBRD/AfD | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | EBRD/AfD | |
| 3 | Kikinda | Ada, Bečej, Kikinda, Nova Crnja, Novi Bečej | JPP | POTENTIAL INVESTMENT (in cooperation with municipalities) | POTENTIAL INVESTMENT (in cooperation with municipalities) | POTENTIAL INVESTMENT (in cooperation with municipalities) | POTENTIAL INVESTMENT (in cooperation with municipalities and JPP) | | |
| 4 | Zrenjanin | Sečanj, Titel, Žitište, Zrenjanin | Landfill is not planned. Prepared documentation for TS. Potential founding trough GEF8, proposal submitted. | Prepared documentation. Potential founding trough GEF8, proposal submitted. | Prepared documentation for composting on local level. Potential founding trough GEF8, proposal submitted. | Prepared documentation. Potential founding trough GEF8, proposal submitted. | JPP | | |
| 5 | Novi Sad | Bačka Topola, Bački Petrovac, Beočin, Novi Sad, Srbobran, Temerin, Vrbas, Žabalj | IPA2021 | Partial, IPA2021 | Partial, IPA2021, composters, planed in second phase | Partial, planed in second phase | IPA2021 | Planed in second phase | In progress |
| 6 | Pančevo | Pančevo, Kovin, Kovačica, Opovo | CRBC second sanitary cell | IPA2017, MEP | IPA2022 | Partial | CRBC | | In preparation |
| 7 | Vršac | Alibunar, Bela Crkva, Plandište, Vršac | KfW | KfW | KfW | KfW | KfW | | |
| 8 | Inđija | Inđija, Irig, Pećinci, Sremski Karlovci, Stara Pazova | Landfill is partially finished | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | | |
| 9 | Sremska Mitrovica | Bogatić, Ruma, Sremska Mitrovica, Šabac, Šid | IPA2008, EBRD/AfD | IPA2008, MEP and IPA2017 | Partial, IPA2022 | IPA2008, partial | | | In preparation |
| 10 | Beograd | Čukarica, Grocka, Mladenovac, Novi Beograd, Palilula, Rakovica, Savski Venac, Sopot, Stari Grad, Surčin, Voždovac, Vračar, Zemun, Zvezdara | JPP | In preparation for OP/WBIF | In preparation for OP/WBIF | In preparation for OP/WBIF | JPP | JPP | Partial, in preparation for OP/WBIF |
| 11 | Smederevo | Golubac, Smederevo, Veliko Gradište | TS to Pančevo sanitary landfill | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | | | |
| 12 | Požarevac | Kučevo, Malo Crniće, Petrovac, Požarevac, Žabari, Žagubica | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | | |

| No | Region | Cities and municipalities of the region | Sanitary landfill (includes waste transfer station if no landfill is provided) | Primary and secondary (bins/containers and vehicles) separation of recycling material (secondary separation line) | Household composting (composters or bags) primary separation (vehicles) of green waste and local composting (machines) | RECYCLING YARDS / waste collection centers (bulky waste, WEE, waste oil, HMW) | Production of RDF / separate collection and biological treatment of biodegradable waste / Conversion of waste into energy | Recultivation of closed unsanitary landfills (required in all municipalities of the regions) | C&D waste treatment |
|---|---|---|---|---|---|---|---|---|---|
| 13 | Lapovo | Despotovac, Lapovo, Rača, Svilajnac | JPP | POTENTIAL INVESTMENT (in cooperation with municipalities) | POTENTIAL INVESTMENT (in cooperation with municipalities) | POTENTIAL INVESTMENT (in cooperation with municipalities) | POTENTIAL INVESTMENT (in cooperation with municipalities) | | |
| 14 | Jagodina | Ćuprija, Jagodina, Paraćin, Smederevska Palanka, Velika Palanka | JPP | POTENTIAL INVESTMENT (in cooperation with municipalities) | POTENTIAL INVESTMENT (in cooperation with municipalities) | POTENTIAL INVESTMENT (in cooperation with municipalities) | Separation line exists | | |
| 15 | Valjevo | Barajevo, Koceljeva, Lajkovac, Lazarevac, Ljig, Mionica, Obrenovac, Osečina, Ub, Valjevo, Vladimirci, Krupanj, Loznica, Mali Zvornik, Ljubovija | EBRD/AfD, TS Koceljeva – finished | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | EBRD/AfD | EBRD/AfD | | |
| 15x | Loznica | | Landfill not planed | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | | |
| 16 | Kragujevac | Aranđelovac, Batočina, Gornji Milanovac, Knić, Kragujevac, Topola, Rekovac | CRBC<br>thermal valorization | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | CRBC | CRBC | CRBC |
| 17 | Kraljevo | Kraljevo, Vrnjačka Banja, Trstenik | CRBC | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | CRBC | | |
| 18 | Raška | Novi Pazar, Raška, Tutin | Potentially EBRD/AfD | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | | |
| 19 | Kruševac | Aleksandrovac, Brus, Ćićevac, Kruševac, Varvarin, Blace | KfW | KfW | KfW | KfW | KfW | KfW | |
| 20 | Užice | Arilje, Bajina Bašta, Čačak, Čajetina, Ivanjica, Kosjerić, Lučani, Požega, Užice | Different sources, EBRD expansion | IPA2017 | IPA2022 | EBRD | EBRD/AfD | | in preparation |
| 21 | Nova Varoš | Noav Varoš, Priboj, Prijepolje, Sjenica | EBRD/AfD | EBRD/AfD | POTENTIAL INVESTMENT | Partial | | | |
| 22 | Zaječar | Boljevac, Bor, Kladovo, Knjaževac, Majdanpek, Negozin, Zaječar | JPP in process according to Coordination committee | JPP in process according to Coordination committee | JPP in process according to Coordination committee | JPP in process according to Coordination committee | JPP in process according to Coordination committee | | |

| No | Region | Cities and municipalities of the region | Sanitary landfill (includes waste transfer station if no landfill is provided) | Primary and secondary (bins/containers and vehicles) separation of recycling material (secondary separation line) | Household composting (composters or bags) primary separation (vehicles) of green waste and local composting (machines) | RECYCLING YARDS / waste collection centers (bulky waste, WEE, waste oil, HMW) | Production of RDF / separate collection and biological treatment of biodegradable waste / Conversion of waste into energy | Recultivation of closed unsanitary landfills (required in all municipalities of the regions) | C&D waste treatment |
|---|---|---|---|---|---|---|---|---|---|
| 23 | Niš | Aleksinac, Gadžin Han, Kuršumlisa, Doljevac, Žitorađa, Merošina, Niš, Prokuplje, Pažanj, Sokobanja, Svrljig | CRBC thermal valorization | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | CRBC | CRBC | CRBC |
| 24 | Pirot | Babušnica, Bela Palanka, Dimitrovgrad, Pirot | EBRD/AfD<br>Second sanitary cell | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | POTENTIAL INVESTMENT | | Partial | in preparation |
| 25 | Leskovac | Bojnik, Crna Trava, Lebane, Leskovac, Medveđa, Vladičin Han, Vlasotince | JPP | Partial, POTENTIAL INVESTMENT in primary separation | POTENTIAL INVESTMENT (in cooperation with municipalities) | POTENTIAL INVESTMENT (in cooperation with municipalities) | Separation line exsist | | |
| 26 | Vranje | Bosilegrad, Bujanovac, Preševo, Surdulica, Trgovište, Vranje | KfW | KfW | KfW | KfW | KfW | KfW | |

**Table 4 Total investment costs for the implementation of the Program**

| Waste Streams | 2022-2049 | 2022-2031 |
|---|---|---|
| Communal waste management | 1.127.044.257 | 866.024.587 |
| Hazardous waste management | 33.000.000 | 25.384.615 |
| Management of specific waste flows | 68.612.700 | 48.195.941 |
| TOTAL | 1.228.656.957 | 939.605.144 |

# Project Overview

Project for Capacity Development of Solid Waste Management
in the Republic of Serbia

## 1 Background of the Project

- The government of Serbia has developed the National Waste Management Program (NWMP), and envisions to realize a **sound material-cycle society** by promoting efficient and sustainable waste management and recycling **with the RWMS at its core**.
- However, small and medium-sized local governments are hesitant to join the system because participation in the RWMS is expected to increase the burden of transportation and treatment & disposal costs on them.
- Therefore, there is an urgent need to build a feasible model for improving the efficiency of collection and transportation of waste to economize waste management costs and for promoting separation and recycling.
- The Government of Serbia has requested Japan International Cooperation Agency (hereafter refer to as "JICA") for implementation of the Project for Capacity Development of Solid Waste Management in the Republic of Serbia (hereafter refer to as "the Project") in order to tackle with the above-mentioned issue.
- The implementation agencies of the Project on the Serbian side were Ministry of Environmental Protection, Sid Municipality, PUC "Standard" Sid, as well as Provincial Secretariat of Environmental Protection – Autonomous Province of Vojvodina.
- The Project activities in Serbia were implemented from May 2021 until February 2024.
- **Sid Municipality,** in order to join the Srem-Macva RWMS, has faced with the drastic increase of waste transportation and treatment & disposal cost. Thus, the Municipality and PUC Standard of Sid, in cooperation with JICA Expert Team (JET), have carried out activities of the Project, discussing and implementing various countermeasures.

### 1.1 Introduction of Sid Municipality

- Population: 27,894*[1]
  - 45.2% reside in Sid Commune.
  - Other 54.8% is distributed to 18 communes.
- Area: 687 sq. km [*2]

[1] National Census in 2022, Statistical Office of Serbia.
[2] "Municipalities of Serbia, 2006", Statistical Office of Serbia and "Strategic development plan of the Municipality of ŠID for the period 2016-2021", Sid City

- Farm land: 60%
- Forestry: 32%

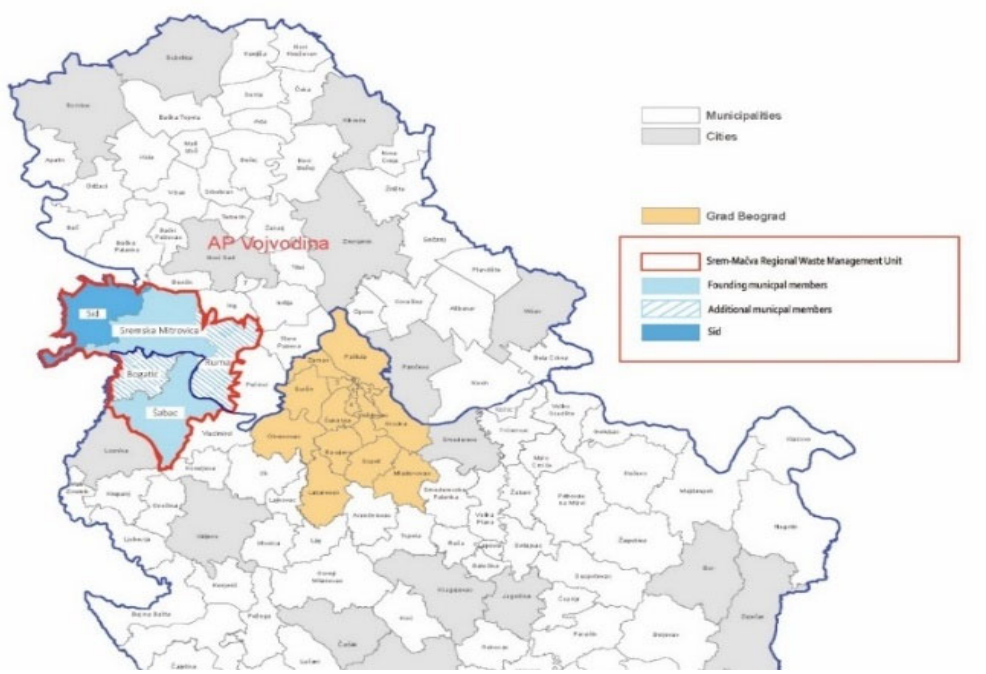



**Figure 4 Locatoin of Sremska-Mitrovica RMWS**

## 1.2 Solid Waste Management of Sid Municipality before the Project

- Waste Discharge and Collection
  - Collection by PUC "Standard" using 5 compactors and one skip loader (SL).
  - No waste separation practiced.
  - Collection service for most city area except for Molovin Commune and some limited areas.
- Waste Disposal
  - 8-ha land for final disposal, located at the North-eastern end of Sid Commune.
  - 42 ton/day
  - No weighbridge (WB). One wheel loader to spread and flatten waste.

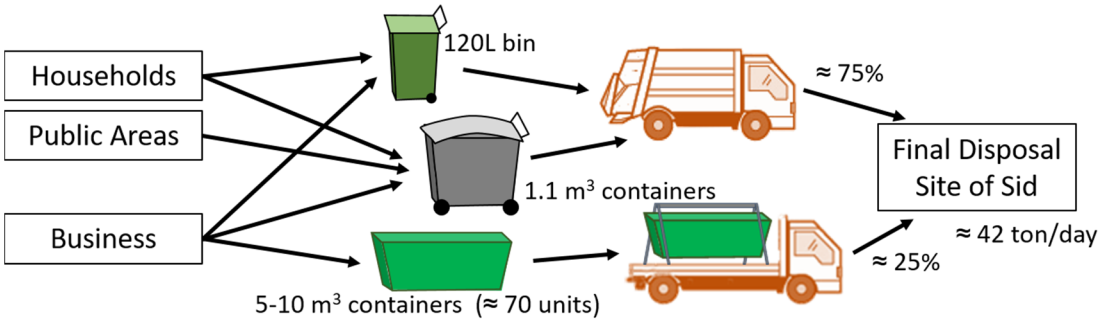



**Figure 5 Waste Collection Flow before the Project**

## 1.3 Sremska Mitrovica Regional Waste Management System

| Name of Cities | Population (2022 census) |
|---|---|
| Sremska Mitrovica | 72,580 |
| Sabac | 105,432 |
| Bogatic | 27,894 |
| Ruma | 48,621 |
| Sid | 27,894 |
| Total | 282,421 |

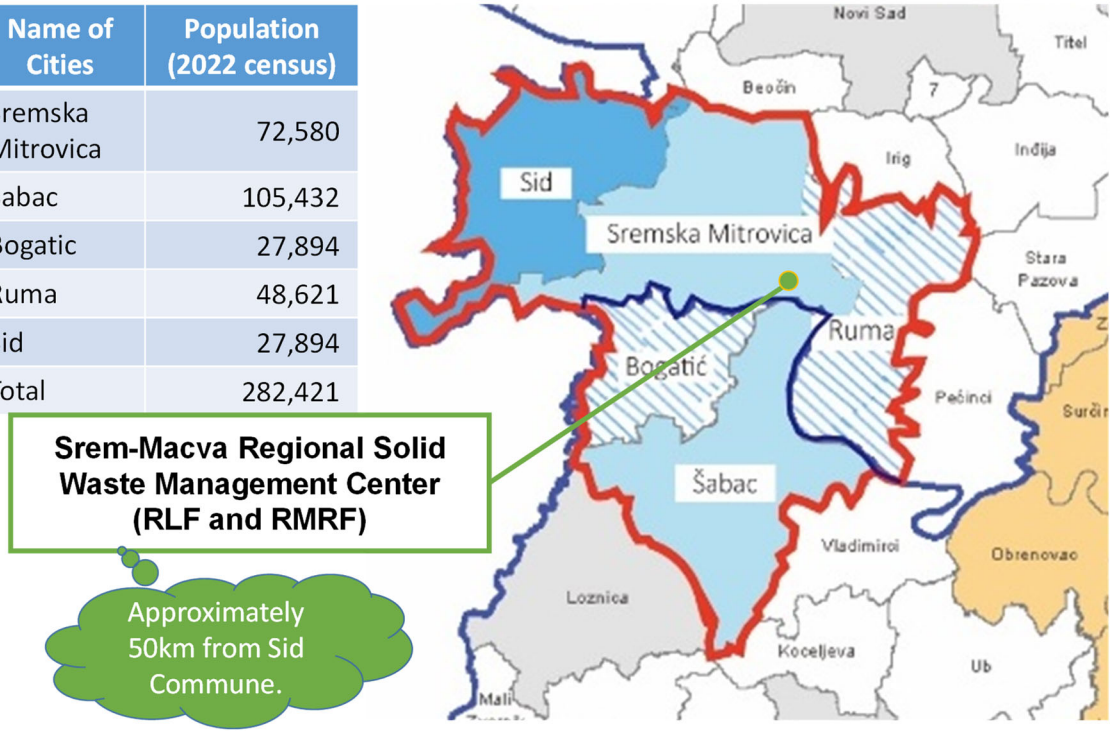



**Figure 6 Map of Sremska Mitrovica Waste Management Region**

## 1.4 Conditions that Sid faced

- ☐ Recyclable waste (specified by IPA) should be separated at 90% quality and delivered to regional material recovery facility (RMRF).
- ☐ The other waste should be delivered to RLF, excluding the following.
  - Hazardous, toxic, radioactive, pathological or biomedical
  - Glass waste
  - Construction and demolition waste (C&D)
  - WEEE (Waste of electric and electronic equipment)

- Green waste (GW; bulky branches)

- Disposal fee (€20/ton was then expected), which was much higher than the disposal cost that Sid used to spend, should be paid for final disposal.

### 1.5 Intervention by IPA

- The recyclable waste separation rule was set and printed on leaflets.
  ➔ JICA project followed this rule.
- The following was procured.
  - One waste compactor truck (CT; 20 m3)
  - 240L blue bins (3,601 units) for recyclable waste
  - 1.1 m3 blue containers (42 units) for recyclable waste
  - 1.1 m3 yellow containers (52 units) equipment) for glass waste

  ➔ JICA project utilized the equipment above and procured additional equipment as explained later.

## 2 Overall Goal, Objectives of the Project

### 1) Overall Goal

The Sid Model is disseminated to other small and medium-sized municipalities to promote Regional Waste Management System (RWMS).

### 2) Objectives

Efficient and sustainable municipal solid waste management (MSWM) is established in Sid Municipality as a model for small and medium-sized municipalities.

### 3) Project Purpose

This Project (June, 2021- May, 2024):

- aims to support advancing the implementation of the RWMS throughout the county by;
  - building an efficient and sustainable waste management system in Sid Municipality, and
  - sharing their lessons learnt as a “Sid Model” for small and medium-sized municipalities:

and

- envisages that “the Sid Model be disseminated to other small and medium-sized municipalities to promote RWMS,” as its overall goal (which is to be achieved after the Project completion).

## 3 Expected Outputs of the Project

**Output 1:** Capacity for analyzing current issues and challenges of MSWM In Sid Municipality is enhanced in line with guidance and standards of RWMS.

**Output 2:** Capacity for waste collection and transportation with source separation being improved.

**Output 3:** Methodologies for minimizing waste generation and promotion of 3Rs are established.

**Output 4:** Capacity for waste minimization and source separation with 3R principles is enhanced among various stakeholders such as residents and business entities.

**Output 5:** Financial, organizational and institutional capacities regarding MSWM are enhanced.

**Output 6:** Experience of establishing sustainable MSWM in Sid municipality

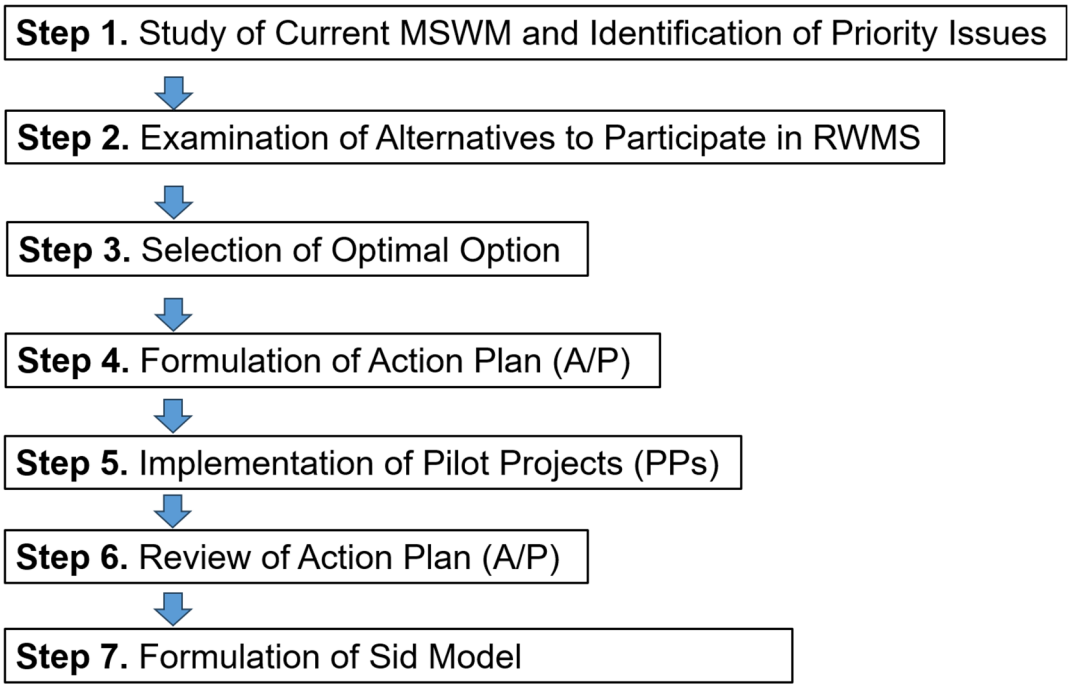



**Figure 7 Flow of the Project Implementation**

## Definition of Sid Model

"Sid Model" is developed as a summary of the outcomes, lessons learnt, and the process that the Municipality and Public Utility Company (PUC) Standard of Sid have taken under the Project, for accelerating participation of small- and medium-sized municipalities to regional waste management system (RWMS) promoted by MEP.

On the other hand, the issues that each municipality faces with vary widely, thus, it is essential for each municipality to understand clearly its current status of solid waste management (SWM) in order to identify the most essential issue to be solved with its financial capacity, before jumping to copying what has been implemented in Sid.

Sid Model will assist a municipality to find out what the municipality would need to do, according to the step in the planning process that the municipality is at now.

| STEP | WHAT YOU'D LIKE TO DO/KNOW | MODULE |
|---|---|---|
| **Step 1.** Study of Current Municipal Solid Waste Management | To understand your waste specifically (depending on specific purpose) | Waste Amount and Composition Survey |
| | | Time & Motion Survey |
| | | Survey of the Current Status of Existing Disposal Sites |
| | | Survey of Current Condition of Collection and Transportation |
| | | Survey on Recycling |
| | | Public Opinion Survey |
| | To have an overall picture of your waste quantitatively | Waste Flow |
| **Step 2.** Identification of Priority Issues | To understand the current status in comparison with national targets | National Program and Priority Issues |
| **Step 3.** Examination of Alternatives to Participate in Regional Waste Management System | To determine what to do with waste targeted by RWMS | Analysis of Alternatives |

| STEP | WHAT YOU'D LIKE TO DO/KNOW | MODULE |
|---|---|---|
| **Step 4.** Development of Technical Plan | To design how to discharge, collect and transport to where for all types of waste | Waste discharge rules and collection & transportation system |
| **Step 5.** Implementation of Technical Plan | To raise public awareness | PP1 Awareness raising |
| | To reduce biodegradable waste through home composting | PP2 Home composting |
| | To convert skip-loader collection to compactor-truck collection and to extend waste collection service | PP3 Collection improvement |
| | To reduce biodegradable waste through green waste management | PP4 Proper management of green waste |
| | To manage waste which has to be dealt with by the municipality | PP5 Recycling Yard (waste management center in municipality) |

# STEP 1

# STEP 1 Study of Current Municipal Solid Waste Management

## A Understanding Your Waste

Baseline Surveys shown in the table below were conducted. Based on the results of the surveys, MSWM Flow of Sid Municipality was developed.

**Table 5 Baseline Surveys Conducted**

| Survey Items | Targets | Content |
|---|---|---|
| Waste Amount and Composition Survey (WACS) | Residents & Businesses Entities | Waste generation amount per capita and per day<br>Preparation of physical composition by source |
| Time and Motion (T&M) Survey | PUC | Collection routes<br>Operation indicators (moving time, collection time, trip length, distances traveled inside/outside collection areas (CAs), moving speed, collection efficiency) |
| Survey of the Current Status of Existing Disposal Sites (DS) | PUC | Survey of the amount of LW<br>Survey of the operation of the final DS<br>Survey of the activities of the informal sector at the final DS |
| Survey of Current Condition of Collection and Transportation | PUC | Survey of volume of waste collected, scope of service, and materials collected<br>Survey of the number and condition of collection vehicles, and income and expenditure related to collection and transportation |
| Survey on Recycling | Waste Pickers<br>Buyers of recyclables | Quantity handled for each recyclable<br>Purchase price, sale value<br>Distribution system & Potential demand |
| Public Opinion Survey (POS) | Residents & Businesses Entities | Survey on the current status of waste management at generation sources (GS)<br>Opinion survey on current MSWM |

### 1 Waste Amount and Composition Survey

**Table 6 Methods of WACS**

| | 1st WACS | 2nd WACS |
|---|---|---|
| Period | November 15 -25, 2021 | (June 28 - ) July 5, 2022 |

| | | |
|---|---|---|
| | (The waste was collected daily from the targeted GSs) | (The waste accumulated for the past 1 week was collected at once) |
| Area | Entire Sid Municipality | The south-western quarter* of Sid Commune |
| Samples | Waste was collected using plastic bags distributed to:<br>66 households (HH),<br>7 schools,<br>17 shops,<br>5 hotels & restaurants and<br>5 factories | Waste collected from 806 HHs by CTs |
| Implementers | Local sub-contractor of JET | By PUC Standard with JET |

Note: *The south-western quarter of Sid Commune was chosen as the survey area since it was the target area of several pilot projects (PP; to be explained in Step 5).

- The results of the 1st WACS showed little GW included, apparently differed from the results of the past WACS conducted by PUC Standard. In order to verify, the 2nd WACS was conducted using a different sampling method.

**Table 7 Results of WACS**

| Result | 1st WACS | | 2nd WACS | |
|---|---|---|---|---|
| Type of GSs | Generation rate (g/unit/day) | | Generation rate (g/unit/day) | |
| HHs | 469 | g/person/day | 1,019 | g/person/day |
| Shops | 505 | g/shop/day | | |
| Restaurants | 3,707 | g/restaurant/day | | |
| Schools | 41.9 | g/student/day | | |
| Factories | 3,897 | g/factory/day | | |

- In the 2nd WACS, the generation rate (1,019 g/person/day) turned out to be more than twice as large as the 1st WACS. The Project decided to use 1,019 g/person/day as the generation rate of household waste in Sid municipality.
- The main reason was GW that the 1st WACS had failed to collect when collecting waste from GSs. GW consists of 36% (Table 8).

**Table 8 Composition of Household Waste (HHW) Collected by the 2nd WACS**

| No | Types | Recorded weights (kg) | Physical Composition (%) |
|---|---|---|---|
| 1 | Paper and cardboard | 107.6 | 3.82% |
| 2 | PET | 60.7 | 2.15% |
| 3 | Plastic bags | 108.8 | 3.86% |
| 4 | Other plastics | 76.6 | 2.72% |
| 5 | Aluminum cans | 10.0 | 0.35% |
| 6 | Metal ferrous packaging | 14.1 | 0.50% |
| 7 | Other metals | 0.4 | 0.01% |
| 8 | Glass | 46.7 | 1.66% |
| 9 | Textile | 110.4 | 3.91% |
| 10 | Composite materials | 19.6 | 0.70% |
| 11 | Other packaging waste | 13.2 | 0.47% |
| 12 | Rubber | 6.2 | 0.22% |
| 13 | Fine particles | 318.3 | 11.29% |
| 14 | Kitchen waste | 772.4 | 27.39% |
| 15 | GW | 1,037.0 | 36.77% |
| 16 | Other | 79.9 | 2.83% |
| 17 | Hazardous waste | 3.1 | 0.11% |
| 18 | WEEE | 5.9 | 0.21% |
| 19 | Bulky waste | 29.1 | 1.03% |
| | Total | 2,820.0 | 100.00% |

**Table 9 Composition of MSW Estimated from Results of 1st and 2nd WACS**

| No | Types | Generation (kg) | Physical Composition (%) |
|---|---|---|---|
| 1 | Paper and cardboard | 4,931 | 11.09% |
| 2 | PET | 1,310 | 2.95% |
| 3 | Plastic bags | 2,352 | 5.29% |
| 4 | Other plastics | 1,657 | 3.73% |
| 5 | Aluminum cans | 499 | 1.12% |
| 6 | Metal ferrous packaging | 714 | 1.60% |
| 7 | Other metals | 14 | 0.03% |
| 8 | Glass | 2,968 | 6.67% |
| 9 | Textile | 1,198 | 2.69% |
| 10 | Composite materials | 333 | 0.75% |
| 11 | Other packaging waste | 224 | 0.50% |
| 12 | Rubber | 189 | 0.42% |
| 13 | Fine particles | 3,616 | 8.13% |
| 14 | Kitchen waste | 11,360 | 25.54% |
| 15 | GW | 11,041 | 24.83% |
| 16 | Other | 1,347 | 3.03% |

| | | | |
|---|---|---|---|
| 17 | Hazardous waste | 723 | 1.62% |
| 18 | WEEE | | |
| 19 | Bulky waste | | |
| | Total | 44,475 | 100.00% |

## 2 Time & Motion (T&M) Survey

- Objectives:

  Obtaining the operation indicators necessary for developing a new waste collection & transportation plan, considering the expansion of collection service to non-serviced area, implementation of separate collection of recyclables, and extension of transportation distance to Srem-Macva RWMC

- Survey methods:
  - At the time of the survey (November, 2011), PUC mobilized 4 CTs, and 1 SL for waste collection services.
  - Data related to each vehicle was recorded **with a Global Positioning System (GPS) logger**, which was loaded on each collection vehicle for every trip.
  - **Limitation of the raw data given by the GPS logger**
  - In case of CT, stoppage time, moving time and moving speed given by the GPS logger cannot be used as they are.
- Operation Indicators

**Table 10 Operation Indicators Determined**

| No | Indicators | Definition |
|---|---|---|
| 1 | Moving speed outside CA | Truck's speed of movement between the CA and the DS or PUC.<br>• Unlike CTs, an SL collects waste only from one container (5 to 10m$^3$) per trip. According to the GPS records, the average moving speed of the SL is **31 km/hr.** |
| The indicators of CT are determined as follows based on the assumption of [CT's moving speed] = [SL's moving speed]. | | |
| 2 | Distance traveled outside CA | The total length of the travels from PUC to CA, CA to DS, and DS to PUC.<br>• Identified from the GPS records |
| 3 | Moving time (outside CA) | The time spent for movements between the CA and the DS/PUC.<br>[Moving time] = [Distance traveled outside CA] / [Moving speed] |

| | | |
|---|---|---|
| 4 | Collection time (inside CA) | Time spent on waste collection in the CA.<br>[Collection time] = [Total time] - [Moving time]<br>• Total time: Identified from the GPS records. |
| 5 | Collection efficiency (inside CA) | Amount of waste collected for 1 hour of the collection time<br>[Collection efficiency] = [Collected Waste] / [Collection time] |

- Findings

**Table 11 Operation Indicators of Container Collection**

| Trucks | Trips | Waste (kg) | Lengths (km) | | | Time (hr) | | | Trip indicators | | Collection efficiency (kg/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Distance traveled outside CA | Distance traveled inside CA | Total length | Moving time | Collection time | Total time | Trip length (km) | Trip time (hr) | |
| CT1 (8 $m^3$) | 4 | 14,328 | 18 | 46 | 65 | 00:35 | 05:23 | 05:59 | 16 | 01:29 | 2,660 |
| CT2 (12 $m^3$) | 1 | 5,834 | 5 | 9 | 14 | 00:08 | 01:15 | 01:24 | 14 | 01:24 | 4,664 |
| CT3 (12 $m^3$) | 4 | 23,336 | 18 | 63 | 81 | 00:35 | 07:50 | 08:26 | 20 | 02:06 | 2,978 |
| CT4 (16 $m^3$) | 1 | 6,335 | 5 | 7 | 12 | 00:08 | 01:29 | 01:38 | 12 | 01:38 | 4,268 |
| Averages | | | | | | | | | 16 | 01:39 | 3,643 |

**Table 12 Operation Inicators of Door-to-Door Collection**

| Trucks | Trips | Waste (kg) | Lengths (km) | | | Time | | | Trip indicators | | Collection efficiency (kg/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Distance traveled outside CA | Distance traveled inside CA | Total length | Moving time | Collection time | Total time | Trip length (km) | Trip time | |
| CT1 (8 m3) | 15 | 53,730 | 69 | 84 | 153 | 02:14 | 20:27 | 22:42 | 10 | 01:30 | 2,626 |
| CT2 (12 m3) | 10 | 58,340 | 46 | 90 | 136 | 01:29 | 21:52 | 23:22 | 14 | 02:20 | 2,667 |
| CT3 (12 m3) | 10 | 50,280 | 193 | 123 | 316 | 06:14 | 27:02 | 33:17 | 32 | 03:19 | 1,859 |
| CT4 (16 m3) | 6 | 38,010 | 319 | 141 | 460 | 10:17 | 22:45 | 33:03 | 77 | 05:30 | 1,670 |
| Averages | | | | | | | | | 33 | 03:10 | 2,206 |

## 3 Survey of the Current Status of Existing Disposal Sites

- **Disposal amount**: The collection amount (42.5 ton/day) – the collection amount of recyclable waste (0.2 ton/day) = 42.3 ton/day
- **Operation**: At the stage when a certain amount of accumulated waste is discharged, leveling is carried out using a wheel loader. The wheel loader is designed for the purpose of moving the target material and, being tire-based, it cannot compact the waste after leveling. Covering is performed approximately once a year with a thickness of 50cm.➔ outbreaks of fire
- **Operational Cost**: In the PUC financial report, expenditures for the landfill are not indicated. Based on operations, the disposal cost is estimated to be below 2€ per ton. However, the disposal fee for RLF is 10 times higher, at 20€ per ton.
- **Rights of the land**: The Sid Municipality does not hold either the land use rights or ownership for the initially planned site for the construction of TS (Transfer Station) and MRF (the adjacent land to the current DS). Despite attempts by the Sid Municipality to alter the land use rights, it was not realized. ➔Cancellation of the construction plans for TS and MRF

## 4 Survey of the Current Condition of Collection and Transportation

- Waste Collection Services: Collection services included mixed-waste collection and bulky waste collection (conducted once a month). The collection of recyclable waste started in Sid Commune in the end of December 2022, and is conducted once a month.
- Collection Vehicles: At the time of survey, the PUC had the following waste collection vehicles: CT 8$m^3$ x1, CT 12$m^3$ x2, CT 16$m^3$ x1, SL x 1, Tractor x 2; in total 7 vehicles.
- **Issues:** When participating in RWMS and use RLF and RMRF, it is anticipated that the transportation by SL, which currently accounts for 20% of the waste collection amount in Sid municipality, will be a burden. As of September 2023**,** large containers used for collection by a SL in the municipality of Sid include 64 containers of 5$m^3$, 5 containers of 7$m^3$, and 1 container of 10$m^3$; in total 70 containers. Out of those, 27 containers are owned by PUC. The average volume of a container is 5.21 $m^3$/unit.
- **Collection Efficiency of a SL:** Based on the records by PUC in 2020, the table below illustrates the waste amount carried by each collection vehicle in one trip. According to this table, the collection capacity per trip for a SL is 1/4 of the smallest CT (8 $m^3$).
- Using a SL to transport waste to RLF, especially when it is more than 50 km away, is highly inefficient.

➔ Having a TS is essential.

**Table 13 Current Collection**

| Vehicle Type | Body ($m^3$) | Num of trips surveyed | | Total waste (kg) | Average Amount | | Density or compaction rate (kg/m3) |
|---|---|---|---|---|---|---|---|
| CT | 8 | 45 | Trips | 161,210 | 3,582 | kg/trip | 448 |
| CT | 16 | 25 | Trips | 158,386 | 6,335 | kg/trip | 396 |
| CT | 12 | 40 | Trips | 201,120 | 5,028 | kg/trip | 419 |
| CT | 12 | 36 | Trips | 210,020 | 5,834 | kg/trip | 486 |
| SL | 5 | 316 | Trips | 283,265 | 896 | kg/trip | 179 (for 5 $m^3$ container) |

## 5 Survey on Recycling

- **Purpose:** To know if any recipients of sorted valuable materials are present in case MRF and RY are installed in the municipality of Sid. → By processing at the source of generation, it becomes possible to reduce the transportation volume to RMRF, resulting in cost reduction.
- **Results:** "The companies marked as 3) and 4) in the table have been collecting valuable materials from the municipality of Sid. Company 3) has a direct contract with major supermarkets in Sid for the collection of cardboard, etc., while Company 4) collects Polyethylene terephthalate (PET) bottles gathered by waste pickers at the Sid DS. It has been confirmed that both companies, 3) and 4), can continue to collect valuable materials such as PET bottles, paper, glass, etc., from the municipality of Sid."

**Table 14 Current Recycling**

| Company | Name of Company | Location (direct distance from the Sid Municipality building) | Valuable materials received |
|---|---|---|---|
| 1) | Metalopromet | Within Sid (1km) | metal, car battery |
| 2) | Dumitrovic otac i sin | Within Sid (1km) | metal, |
| 3) | Kappa Star Recycling | Sabac (56km) | Paper, soft plastics, PET bottles, wood, glass, metal, |
| 4) | BENTA | Backa Palanka (21km) | Paper, soft plastics, PET bottles, wood, glass, metal, |

## 6 Public Opinion Survey (POS)

- Purpose:

To understand the level of awareness about waste management among the citizens and the business holders. The following items were asked:

1. Current practice of waste discharging
2. Level of awareness and satisfaction regarding current waste management services
3. Opinion toward implementation of separate collection of waste
4. Willingness to pay the waste collection fee and agreeable amount
5. Opinions about discharging and collecting methods and manners
6. Practice of on-site treatment and selling of the recyclables

- Survey period:

  November 8 to 26, 2021

- Survey area:

  The entire municipality of Sid (400 HHs, 101 business entities)

- Survey method:

  Face-to-face interview based on a questionnaire

  Separate sets of questionnaires for HHs and business entities (including some same questions.)

  Sample number per commune base on the population distribution

  Interview conducted by a third party (not PUC or the municipality staffs)

- Survey Results and their utilization

1. For development of Waste Flow: From the POS results, based on the responses about self-disposal and selling of the recyclable, the rates of self-disposal, improper disposal, and composting, and the recycling rate of recyclable were calculated for the Waste Flow.

**Table 15 Current Recycling Rate Estimated**

| No | Category | HHs | Non-HHs | Remark |
|---|---|---|---|---|
| A | Recycle rate by recyclable waste: | | | |
| | 1. Paper | 1.25% | 8.91% | |
| | 2. Cardboard box | 1.00% | 11.88% | |
| | 3. Glass bottles | 3.25% | 0.99% | |
| | 4. Aluminum cans | 0.75% | 3.96% | |
| | 5. Metal cans | 0.25% | 1.98% | |
| | 6. Plastic bottles | 1.50% | 6.93% | |

| | | | | |
|---|---|---|---|---|
| | 7. Soft plastics | 1.75% | 2.97% | |
| | 8. Hard plastics | 0.75% | 2.97% | |
| | 9. Clothes/textile | 7.25% | 0.99% | |
| | 10. Metal items other than cans | 4.50% | 2.97% | |
| B | Composting rate (GW) | 14.50% | 1.98% | |
| C | Self-disposal rate | 1.00% | 0.00% | |
| D | Improper disposal rate | (See Remark) | 0.00% | (For HHs): Waste discharged by the HHs residing in Molovin commune, where collection service is unavailable. |

2. The rate of self-disposed waste (For HHW, 1.0%), and the rate of recycled waste (RW) at the time of the survey (For HHW, 1.25% of paper, 3.25% of glass bottles, etc.) were identified.
3. The following two points were found out, indicating that the citizens of Sid municipality has already taken a certain range of actions within their capacity toward "waste reduction"
    - At least 78% of HHs carry out a certain type of waste minimization activities (such as use of their own bags (72%), home composting (14%), etc.);
    - Almost all of the business institutions, whenever possible, try to minimize the use of packages/bags or office paper.

    ➔ Based on this result, it was decided that the measure for waste reduction in Sid Municipality was narrowed down to promotion of home composting.
4. The areas where the HHs practicing home composting were present were found out (with in Sid commune, 18 HHs (17%) answered they were conducting home composting) and indicated the possibility of home composting without a bin.

## B Drawing the Waste Flow

### 1 Purpose of Waste Flow:

- To show the current status of waste management to the stakeholders in a visible and quantitative way.

### 2 Basic chart

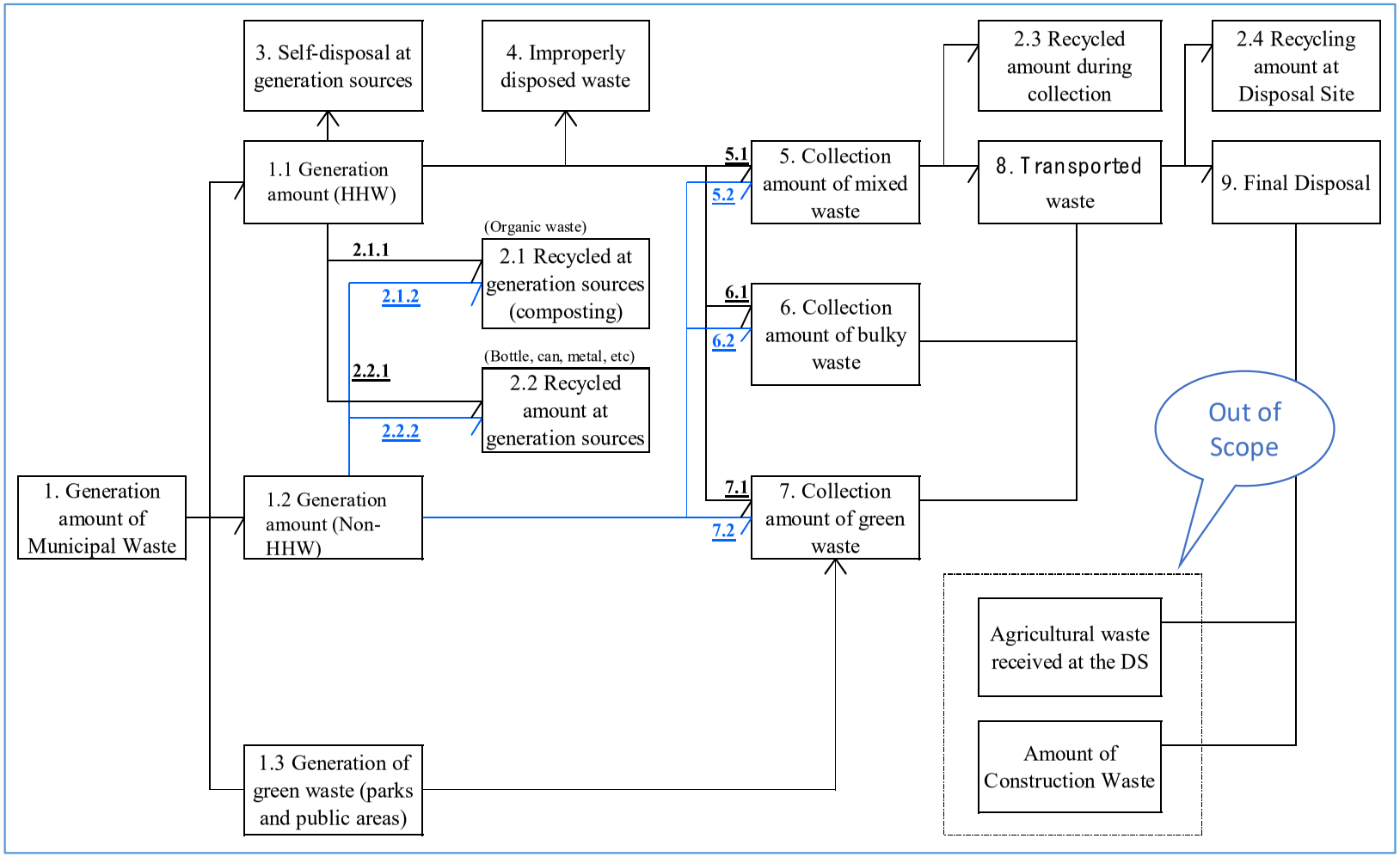



**Figure 8 Basic Chart of Waste Flow**

## 3 Development of Waste Flow: Methods

**Table 16 Methods of Waste Flow**

| Number | Type | Equation | Source | Amount (kg/day) |
|---|---|---|---|---|
| 1 | Generation Amount of MW | 1.1 + 1.2 + 1.3 | | 44,475 |
| 1.1 | Generation Amount of HHW | $GR_{HHW}$ (1.022) x Population (28,404) | $GR_{HHW}$: Generation Rate of HHW (1,019 g/psn/day) obtained from WACS done in July 2022, with the rate of separately collected bulky waste (2.8=>3 g/psn/day) added (=>The rate of bulky waste was estimated from the data of the PUC's separate collection of bulky waste).<br>* Population in 2021 | 29,024 |
| 1.2 | Generation Amount Non-HHW: | (Amount of mixed collection – Collection amount of HHW) +2.1.2 + 2.2.2 | | 15,185 |
| 1.3 | Generation Amount of GW from Public Area | | Survey of the Current Status of Existing DS | 266 |
| 2.1 | Recycled at GSs (Composting): | 2.1.1 + 2.1.2 | | 795 |
| 2.1.1 | Composting of HHW | | | 792 |
| 2.1.2 | Composting of Non-HHW | | * (Home composting rate of HH & Non-HH [percentage]) x Compostable Waste Amount | 3 |
| 2.2 | Recycled Amount at GSs | 2.2.1 + 2.2.2 | | 763 |
| 2.2.1 | Recycled HHW | | | 146 |
| 2.2.2 | Recycled Non-HHW | | * (On-site recycling rate of HH & Non-HH [percentage]) x Recyclable Waste Amount | 617 |
| 2.4 | Recycling Amount at DS | | *An estimate based on the results of the interviews with waste pickers and recycling companies | 196 |
| 3 | Self-disposal at GSs | | * Self-disposal rate x HHW Generation Amount | 280 |
| 4 | Improperly Disposal Waste | | * HHW discharged in Molovin Commune where collection service was not provided. | 150 |

| Number | Type | Equation | Source | Amount (kg/day) |
|---|---|---|---|---|
| 5 | Collection Amount of Mixed Waste: | 8 -6 -7 | | 31,676 |
| 6 | Collection Amount of Bulky Waste: | | * Separately Collected Bulky Waste + (Rate of Bulky Waste x Mixed Waste Collection Amount). | 717 |
| 7 | Collection Amount of GW: | * Separately Collected GW + (Rate of GW x Mixed Waste Collection Amount). | | 10,094 |
| 8 | Transported Waste to DS | 42,142 (Collection of Communal Waste) + 80 (Separately collected Bulky Waste) + 266 (GW from public areas) | | 42,487 |
| 9 | Final Disposal: | 42,487 (Transported Waste) - 196 (Recycling Amount at DS) | | 42,291 |

## 4 Summary

1. The percentage of waste transported to the landfill site is **95.1%**, i.e. Generation - Recycling rate (3.9 %) – Share of self-disposal (0.6 %) – Share of improper disposal (0.3 %). => It should be decreased.
2. Recycling rate (3.9 %) should be increased.
3. The share of Self-disposal (0.6 %) should become “0” by expanding the coverage of the MW collection service.
4. The share of improper disposal (0.3 %) should become “0” by providing MSW collection service to all population of Sid Municipality.

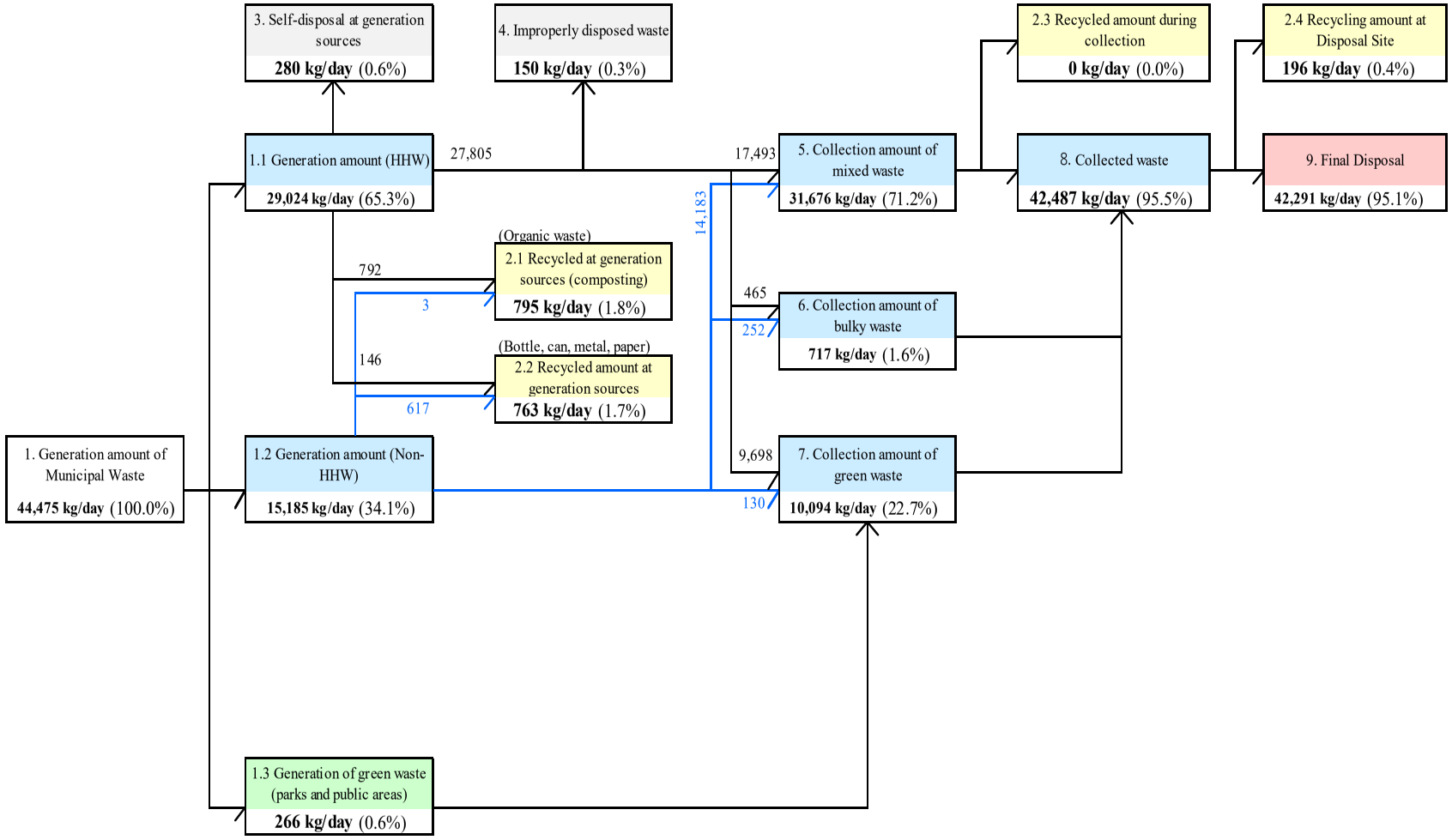



**Figure 9 Waste Flow in 2022**

## LESSONS LEARNT

✓ Conducting various surveys about waste management provides the understanding of the current status in depth and helps in identifying your municipality's own priority issues.

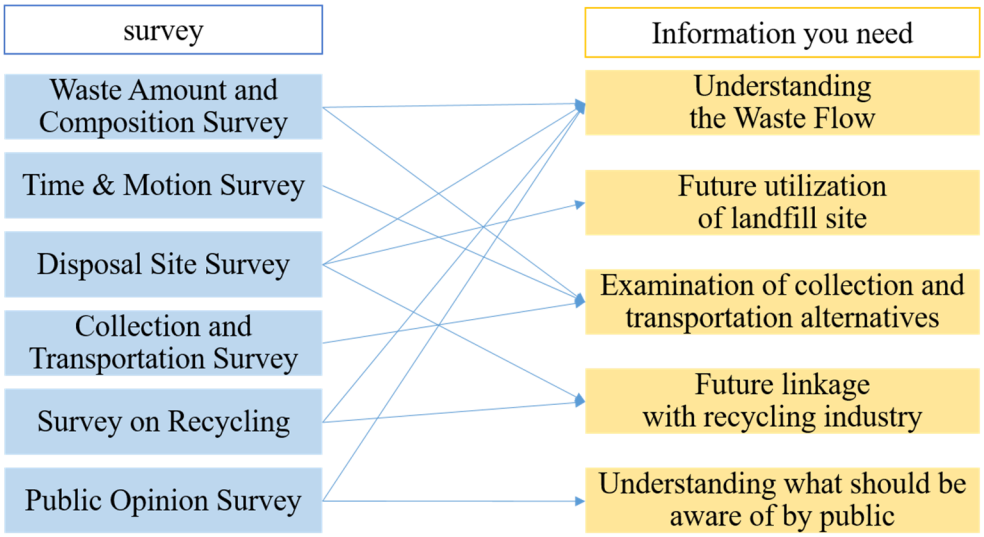



**Figure 10 Information Collected from Various Surveys**

✓ WACS provides quantitative base for planning collection and transportation plan.

✓ Waste categorization should be carefully determined and survey method should also be carefully designed.

- In Sid, GW accounts for a large proportion of municipal waste, thus it should have been designed to allow such waste to be discharge for the survey. Collecting sample from the waste discharged to regular collection service (as in the 2nd WACS) will be a good way.
- If it is already known what types of waste will be accepted by the RMRF, those should be taken into account to determine waste categorization of the survey. For example, if the RMRF accepts not the all metal waste but only drink and food cans and metal caps and lids, the survey should have one category for drink and food cans and metal caps and lids and the other category of any other metal waste.

✓ For POS,

- Designing the questionnaire that matches with the purpose is necessary, such as including questions about waste treatment at GSs (which allowed us to use the data for developing waste flow, and to know existence of non-formal

recycling activities and conventional composting method, etc.). (See Reference No. 1 for the questionnaire by JET as a sample.)

- Conducting interviews by third party will allow the interviewees to freely express such practices.

✓ When planning a facility, it may be good to compare your plan and the cadastral to make sure the sufficient land can be secured.

✓ For T&M Survey, it is efficient to use a GPS logger, but data should be used carefully as some data cannot be used as they are.

If a GPS logger is not available, the necessary data (time and distance) can be collected by following (or getting on) collection vehicles with your mobile phone, while recording the time and points on Google Map at the following timing:

- When starting from PUC
- When arriving the first collection point
- When leaving from the final collection point
- When arriving at DS

✓ The development of the waste flow is an important process to integrate the data obtained in the series of baseline surveys presented earlier.

✓ The waste flow thus developed gives an overall picture of the current waste management status and helps us identify issues to address (see Step 2).

**Reference No. 1**

# Questionnaire of POS conducted by JET in 2021

**Istraživanje javnog mnjenja (za domaćinstva)**

| v | Br. pitanja | Pitanje | Odgovor |
|---|---|---|---|
| | | Broj uzorka | |
| | | Ime anketara | |
| | | Datum ankete | |
| | | Vreme početka: | (Auto-upisivanje) |

**<podaci o ispitaniku>**

| | | |
|---|---|---|
| ~~2a.~~ 1a. | Adresa (Molimo odaberite svoju komunu.) | 1 Sid / 2 Erdevik/ 3 Kukujevci / 4 Adasevci /5 Morovic /6 Visnjicevo /7 Vasica /8 Bačinci / 9 Berkasovo/ 10 Gibarac /11 Jamena / 12 Bingula /13 Ilinci /14 Sot /15 Ljuba /16 Bikić Dol /17 Batrovci /18 Molovin /19 Privina Glava |
| ~~5~~ 2 | Uzrast | |
| ~~6~~ 3 | Pol | 1. Muško<br>2. Žensko<br>3. Drugo |
| ~~7~~ 4 | Veza sa glavom domaćinstva | 1. On/Ona<br>2. Supružnik<br>3. Brat/Sestra<br>4. Ja sam njegovo/njeno dete.<br>5. Ostalo (Molim navedite.) |

**I. Opšta pitanja**

Pre nego što pričamo o otpadu, kažite nam o opštim problemima u vašem gradu.

| | | |
|---|---|---|
| 1-1. | Molim vas izaberite bilo koje od pitanja koje smatrate problematičnim u vašem gradu. | 1. Neadekvatno snabdevanje vodom za piće<br>2. Nestabilno snabdevanje električnom energijom<br>3. Visoka stopa kriminala<br>4. Siromaštvo<br>5. Ekonomska pitanja poput inflacije<br>6. Socijalni nemiri<br>7. Politička nestabilnost<br>8. Zagađenje (uključujući vazduh, vodu, buku i otpad)<br>9. Poplave<br>10. Problemi sa lekovima<br>11. Nezaposlenost<br>12. Zemljišni sporovi<br>13. Ne znam<br>14. Drugo (Molim navedite.) |
| 1-2. | Molim vas procenite u kojoj meri vam svaka od navedenih javnih usluga predstavlja problem u svakodnevnom životu.<br>Nema nikakvih problema<br>Retko pronalazim problem<br>Podnošljivo<br>Problematično<br>Potrebno je hitno obratiti pažnju | 1. Snabdevanje vodom:<br>2. Kanalizaciona mreža<br>3. Atmosferska kanalizacija<br>4. Pražnjenje vode iz septičkih jama<br>5. Snabdevanje električnom energijom<br>6. Pristupni putevi do kuća<br>7. Telefon<br>8. Drugo (Molim navedite: |
| 1-3. | Da li ste zainteresovani za pitanja životne sredine? | 1. Da, veoma.<br>2. Da, ali malo.<br>3. Ne. |
| | | |
| 1-4. | Koji je ekološki problem po vašem mišljenju najozbiljniji u vašem gradu? Molimo izaberite jedan. | 1. Zagađenje vode<br>2. Zagađenje vazduha<br>3. Problemi sa bukom<br>4. Problemi sa čvrstim otpadom (đubre)<br>5. Poplave<br>6. Krčenje šuma<br>7. Drugo (Molim navedite: |

| | | |
|---|---|---|
| 1-5. | Koliko osećate da degradacija životne sredine utiče na vaš život? | 1. Ne utiče uopšte.<br>2. Utiče do izvesnog stepena.<br>3. Izaziva ozbiljne probleme.<br>4. Ne znam.<br>5. Drugo (Molim navedite:<br>6. Bez odgovora. |
| 1-6. | Da li u vašem susedstvu postoje problemi uzrokovani nekontroliranim bacanjem otpada? | 1. Da<br>2. Ne<br>3. Ne znam. |
| 1-7. | Koje probleme u vašem gradu primećujete kao posledice nekontrolisanog otpada?<br>(Označite sve odgovore koje uočite.) | 1. Razbacivanje velike količine otpada po ulicama.<br>2. Životinje dolaze da jedu otpad po ulicama.<br>3. Neprijatan miris od otpada ostavljenog na ulicama.<br>4. Pacove i muve privlači otpad ostavljen na ulici.<br>5. Kanalizacioni sistem je blokiran bačenim otpadom u kanalima i poplave nastaju u kišnoj sezoni.<br>6. Voda je zagađena bačenim otpadom, što izaziva kožne bolesti i dijareju .<br>7. Požari na deponiji izazivaju emisiju štetnih gasova.<br>8. Podzemne vode su zagađene otpadom na deponiji.<br>9. Sadašnja deponija je skoro puna.<br>10. Ostalo (Molim navedite: |
| 1-8. | Da li znate gde se odlaže otpad iz vašeg domaćinstva? | 1. Ne<br>2. Da (Ime lokacije, ako znate: ) |

**Deo 2. O vašem otpadu i upravljanju njime**

| | | |
|---|---|---|
| 2-1. | Kako držite otpad u svojoj kući? | 1. U vrećama koje se mogu zatvoriti.<br>2. U kanti za otpad sa poklopcem.<br>3. U posudi za bacanje (posuda za hranu, itd.) sa poklopcem.<br>4. U korpi za otpatke ili kanti za otpad bez poklopca.<br>5. Drugo (Molim navedite: |
| | Molimo pogledajte sliku i odgovorite na pitanje 2-2. | (Napomena: Priloženo manje od 1MB. ) |
| 2-2. | Kako bacate svoj kućni otpad?<br>  | 1. U vrećama, vezano.<br>2. U kantu za otpad sa poklopcem (koja se vraća nakon pražnjenja otpada).<br>3. U korpu za otpatke ili kantu za otpad bez poklopca (koja se vrać a nakon pražnjenja otpada).<br>4. U posudi za bacanje (posuda za hranu, kartonska kutija, itd.) sa poklopcem, koju bacate sa smećem.<br>5. U ručnim kolicima (koja se vraćaju nakon pražnjenja otpada).<br>6. Drugo (Molim navedite: |

| | |
|---|---|
| 2-3. Da li trenutno koristite uslugu sakupljanja otpada? | 1. Da |
| | 2. Ne, usluga sakupljanja nije dostupna u mom komšiluku. |
| | 3. Ne, odlučio sam da ne koristim uslugu sakupljanja. |
| | 4. Ne znam |

| | |
|---|---|
| 2-4. Kakve usluge sakupljanja se pružaju u vašem komš iluku? | 1. **Sakupljanje komunalnih kontejnera**, gde stanovnici donose svoj otpad na određeno mesto ili u komunalni kontejner za skladiš tenje |
| | 2. **Sakupljanje na trotoaru**, gde stanovnici odlažu svoj otpad duž ulice ili na trotoaru radi sakupljanja. |
| | 3. Ne znam. |
| | 4. Drugo (Molim navedite:) |

**(1) Komunalno sakupljanje**

| | |
|---|---|
| (CC) 3-1. Koliko često bacate svoj otpad? | 1. Svaki dan osim vikendom i praznicima |
| | 2. Jednom nedeljno |
| | 3. Svaki drugi dan |
| | 4. Dvaput nedeljno |
| | 5. Bez pravila |

| | |
|---|---|
| (CC) 3-2 Koliko često se sakuplja otpad u vašem kraju? | 1. Svaki dan osim vikendom i praznicima |
| | 2. Jednom nedeljno |
| | 3. Svaki drugi dan |
| | 4. Dvaput nedeljno |
| | 5. Bez pravila |
| | 6. Ne znam |

| | |
|---|---|
| (CC) 3-3 Kako bacate svoj kućni otpad? | 1. Na zemlju u naznačenom uglu u mom komšiluku |
| | 2. Na zemlju negde duž ulice, gde nađem gomile otpada |
| | 3. Na predviđenom mestu za kontejner u svom komšiluku |
| | 4. U kontejneru koji nađem na putu |
| | 5. Drugo (Molim navedite: |

Molimo kliknite da nastavite na pitanje 4-1.

**(2) Sakupljanje na trotoaru**

| | | |
|---|---|---|
| (CS) 3-1 | Gde bacate svoj kućni otpad? | 1. Ispred svoje kuće.<br>2. Na predviđenom uglu u mom kvartu.<br>3. Na uglu gde nađem gomilu otpada usput.<br>4. Ne znam<br>5. Drugo (Molim navedite: |
| (CS) 3-2 | Koliko često sakupljaju otpad u vašem komšiluku? | 1. Svaki dan osim vikendom i praznicima<br>2. Jednom nedeljno<br>3. Svaki drugi dan<br>4. Dvaput nedeljno<br>5. Bez pravila<br>6. Ne znam |
| (CS) 3-3 | Kako odlažete svoj kućni otpad na dan kada usluga sakupljanja otpada nije dostupna u vašem komšiluku? | 1. Mogu da ga čuvam do sledećeg dana sakupljanja.<br>2. Bacam ga gde nađem gomilu otpada usput.<br>3. Bacam ga u kontejner koji pronađem usput.<br>4. Zakopavam ga u svom dvorištu.<br>5. Spaljujem ga u svom dvorištu.<br>6. Drugo (Molim navedite:<br>7. Drugo (Molim navedite: |
| (CS) 3-4 | Da li mislite da otpad koji bacate izaziva probleme kao su hranjenje životinja i loši mirisi? | 1. Da.<br>2. Ne.<br>3. Bez odgovora |

**(3) Za sve one koji koriste uslugu sakupljanja**

| | | |
|---|---|---|
| 4-1. | Da li ste zadovoljni uslugom sakupljanja otpada? | 1. Da, potpuno zadovoljan.<br>2. Da, donekle.<br>3. Ne mnogo.<br>4. Uopšte ne.<br>5. Ne znam. |
| 4-2. | U kom aspektu biste voleli da vidite poboljšanje? Molim vas izaberite najadekvatniji odgovor. | 1. Naknada za uslugu je skupa.<br>2. Raspored sakupljanja nije pouzdan.<br>3. Učestalost prikupljanja otpada nije dovoljna.<br>4. Ponašanje sakupljača nije lepo.<br>5. Udaljenost od mesta sakupljanja do moje kuće.<br>6. Veličina ili broj komunalnih kontejnera nije dovoljna.<br>7. Prljavo okruženje oko mesta sakupljanja.<br>8. Drugo (Molim navedite: |

(NC) 5-1 Da li vam je potrebna usluga sakupljanja otpada?

1. Da, veoma mnogo.
2. Da donekle.
3. Ne treba mi mnogo.
4. Uopšte mi ne treba.
5. Ne znam

(NC) 5-2 Da li ste voljni da platite da biste dobili uslugu sakupljanja otpada?

1. Veoma voljan
2. Voljan u određenoj meri
3. Nisam baš voljan
4. Uopšte nisam voljan

(NC) 5-3 Koliko sebi možete priuštiti da plaćate mesečno za uslugu sakupljanja? RSD.

(NC) 6. Da li ste voljni da učestvujete u aktivnostima prikupljanja otpada, kao što je dovoženje otpada na određeno mesto u određeno vreme?

1. Veoma voljan
2. Voljan u određenoj meri
3. Nisam baš voljan
4. Uopšte ne

(NC) 7. Kako se odlaže vaš otpad? Molimo vas da izaberete kako se to čini na dnevnom niovu. (MA)

1. Baca se na ulice, u kanal ili na otvoreno zemljište.
2. Spaljuje se na mom imanju.
3. Zakopava se na mom imanju.
4. Kompostira se na mom imanju.
5. Prevozi se do sabirnog mesta u drugim oblastima gde se usluga pruža.
6. Ne znam.
7. Drugo:

**4. Pitanja ponovne upotrebe/recikliranja**

| | | |
|---|---|---|
| 8 | Da li nekome dajete ili prodajete bilo koji deo svog otpada?<br>**(Odaberite odgovarajuće.)** | 1. Da, nešto dajem besplatno.<br>2. Da, prodajem neke stvari.<br>3. Da, i poklanjam i prodajem.<br>4. Ne, ne prodajem, niti dajem. |

Ako ste na pitanje 8 odgovorili 1), 2) ili 3)

| | | |
|---|---|---|
| 9 | Molimo vas da odaberete sve stvari koje poklanjate | 0. Ne poklanjam ništa.<br>1. papir<br>2. kartonske kutije<br>3. staklene boce<br>4. aluminijumske konzerve<br>5. metalne konzerve<br>6. plastične boce<br>7. meku plastiku (Primer: kese za kupovinu, plastične folije za pakovanje.)<br>8. tvrdu plastiku (Primer: plastične igračke, plastičan nameštaj…)<br>9. odeću/tekstil<br>10. metalne predmete osim konzervi<br>11. Drugo (Molim navedite: _____) |

| | | |
|---|---|---|
| 10 | Molimo vas da odaberete sve stvari koje nekome prodajete. | 0. Ne prodajem nikakve stvari.<br>1. papir<br>2. kartonske kutije<br>3. staklene boce<br>4. aluminijumske konzerve<br>5. metalne konzerve<br>6. plastične boce<br>7. meku plastiku (Primer: kese za kupovinu, plastične folije za pakovanje.)<br>8. tvrdu plastiku (Primer: plastične igračke, plastičan nameštaj…)<br>9. odeću/tekstil<br>10. metalne predmete osim konzervi<br>11. Drugo (Molim navedite: _____) |

| | | |
|---|---|---|
| 11 | Da li smatrate da je recikliranje bezopasnog otpada kao što su papir, plastika, staklo i metal neophodno? | 1. Da<br>2. Ne |

Ako ste na pitanje 11 odgovorili sa 1) da

| | | |
|---|---|---|
| 12 | Zašto mislite da je neophodno? | 1. Recikliranje pomaže smanjivanju otpada koji se odlaže.<br>2. Recikliranje će smanjiti količinu otpada na deponiji<br>3. Recikliranje će pomoći u zaštiti životne sredine<br>4. Recikliranjem će se zaraditi dodatni novac<br>5. Drugo (Molim navedite: |

| | | |
|---|---|---|
| 13 | Da li trenutno praktikujete bilo koji od sledećih metoda? | 1. Nosim sopstvenu torbu (ili kesu za kupovinu) kada idem u kupovinu.<br>2. Ponovo koristim staklene boce ili tegle kod kuće.<br>3. Donosim sopstveni šolju za pića za poneti.<br>4. Vraćam prazne boce od pića u prodavnice.<br>5. Drugi načini za smanjenje otpada (Molim navedite.) |

| | | |
|---|---|---|
| 14 | Ukoliko bi škole ili bilo koje grupe iz zajednice u vašem kraju prikupljale sredstva kroz prodaju materijala za ponovno korišćenje ili recikliranje, da li biste sarađivali doniranjem ovih materijala ili učestvovali u sakupljanju? | 1. Da, učestvovao bih<br>2. Ne, ne bih učestvovao<br>3. Ne znam |

**4. Pitanja zelenog otpada**

| | | |
|---|---|---|
| 15 | Da li imate zeleni otpad (baštenski otpad i/ili otpad sa va še farme)? | 1. Da<br>2. Ne<br>3. Ne znam |

Ako ste na pitanje 15 odgovorili sa 1) da

| | | |
|---|---|---|
| 16. | Kako upravljate zelenim otpadom? | 1. Kada je neophodno, zovem službu za sakupljanje zelenog otpada i plaćam dodatnu naknadu za uslugu.<br>2. Bacam zeleni otpad sa ostalim otpadom.<br>3. Bacam ga u reku, na otvoreno zemljište ili kraj ulice.<br>4. Spaljujem ga u zadnjem dvorištu.<br>5. Zakopavam ga u zadnjem dvorištu sa ostalim otpadom<br>6. Kompostiram ga (tj. pravim đubrivo od njega) u svom dvorištu<br>7. Ne znam. |

| | | |
|---|---|---|
| 17. | Koliko plaćate za ovu uslugu? | RSD |

**5. Javna saradnja**

| | | |
|---|---|---|
| 18. | Da li ste ikada od bilo koga dobili bilo kakva uputstva o tome kako da odlažete otpad? | 1. Da<br>2. Ne<br>3. Ne znam |

Ako ste na pitanje 18 odgovorili sa 1) da

| | | |
|---|---|---|
| 19. | Ko vam je dao uputstva? | 1. Članovi porodice<br>2. Učitelj u školi<br>3. Član zajednice<br>4. Član nevladine organizacije<br>5. Opština<br>6. Firma za sakupljanje otpada<br>7. Drugo: _____ |

| | | |
|---|---|---|
| 20. | Da li ste promenili način odlaganja otpada nakon dobijanja uputstava? | 1. Da<br>2. Ne |

| | | |
|---|---|---|
| 21. | Da li bilo ko ko živi u vašoj kući ili vaša kućna pomoćnica čisti trotoar ili javne površine oko vaše kuće? | 1. Da, ponekad<br>2. Da, gotovo svakodnevno<br>3. Ne. |

| | | |
|---|---|---|
| 22. | Da bi se rešili problemi bacanja smeća na ulicama i bacanja u reke, koje mere mislite da bi bilo najefektnije sprovesti? | 1. Usvojiti propise protiv bacanja smeća kako bi se strogo kontrolisalo.<br>2. Broj vozila za sakupljanje i radnika treba povećati.<br>3. Uputiti ljude kako da odlažu otpad da bi se stekle bolje navike.<br>4. Treba postaviti više uličnih kontejnera.<br>5. Ne znam<br>6. Drugo (Molim navedite: |

| | | |
|---|---|---|
| 23 | Da li bi ste pristali da odlažete svoj otpad u određeno vreme i na određeno mesto, ukoliko to postane pravilo? | 1. Dobro je uspostaviti pravila i ja poštujem pravila.<br>2. Ukoliko vozilo/radnici za sakupljanje otpada dolaze na vreme, onda bih i ja sledio pravila.<br>3. Ne očekujem da će to funkcionisati, jer drugi neće to poštovati. |

| | | |
|---|---|---|
| 24 | Da li imate iskustva sa bilo kakvim ekološkim aktivnostima (čišćenje, posteri ili medijska kampanja, itd. ...) s ciljem da vaš grad bude čistiji, tokom proteklih 10 godina? | 1. Da.<br>2. Ne, ali mnogo ranije sam imao iskustva.<br>3. Ne, nikada nisam imao nikakva iskustva. |

Ako ste na pitanje 24 odgovorili sa 1) da

| | | |
|---|---|---|
| 25 | Sa kakvim aktivnostima ste imali iskustva? | 1. Čišćenje<br>2. Takmičenja u govorništvu ili umetnosti na temu životne sredine<br>3. Medijska kampanja uz postere, banere, u masovnim medijima<br>4. Drugo (Molim navedite.) |

| | | |
|---|---|---|
| 26 | Ko je bio domaćin ili organizator aktivnosti? | 1. Škola za decu<br>2. Opština ili JKP<br>3. Privatna kompanija<br>4. Nevladine organizacije<br>5. Ne znam |

| | | |
|---|---|---|
| 27 | Molimo vas navedite ime domaćina/organizatora, ukoliko se sećate. | 1. Ne sećam se.<br>2. Ime: |

| | | |
|---|---|---|
| 28 | Tokom pandemije COVID-19, da li se dnevna količina otpada nastala u vašem domaćinstvu povećala ili smanjila? | 1. Da_povećala se_<br>2. Bez_ promene.<br>3. Ne_smanjila se_ |

| | | |
|---|---|---|
| Q 29. | Za koju od sledećih vrsta otpada mislite da se povećala ili smanjila?<br><br>1) Veoma se povećala<br>2) Donekle sepovećala<br>3) Bez promene<br>4) Donekle se smanjila<br>5) Veoma se smanjila | 1. plastični kontejneri (kutije, kese, omoti)<br>2. papir (kutije, kese, omoti)<br>3. kartonske kutije<br>4. plastične boce<br>5. staklene boce (boce od pića i tegle)<br>6. otpaci od hrane<br>7. metalne konzerve<br>8. higijenska sredstva (maske, maramice, rukavice) |

**6. Mediji**

| | | |
|---|---|---|
| 30 | Preko kog sredstva javnog informisanja se najčešće informišete? | 1) Vesti na radiju.<br>2) Vesti na TV-u.<br>3) Dnevne novine<br>4) Vesti sa interneta.<br>5) Društvene mreže (Facebook, Twitter, Instagram, itd....) |

**7. O vama i vašoj porodici**

| | | |
|---|---|---|
| 31. | Koliko ljudi stalno živi u vašoj kući? Molim vas urač unajte sebe, druge odrasle, decu i bebe. | |

(broj)

| | | |
|---|---|---|
| 32. | Ko u vašoj kući iznosi smeće iz kuće? | 1. bilo koja odrasla ženska osoba<br>2. bilo koja muška odrasla osoba<br>3. deca<br>4. bilo ko ko ostaje u kući na dan sakupljanja<br>5. bilo ko ko izlazi napolje na dan sakupljanja<br>6. bilo ko ko izlazi napolje kada je kontejner za smeće napunjen. |

jedan odgovor

| | | |
|---|---|---|
| 33. | U kojoj vrsti domaćinstva živite sada? (Zapažanje anketara + pitanje o vlasništvu) | 1. U našoj samostalnoj kući<br>2. Iznajmljenoj samostalnoj kući<br>3. Jednoj od kuća izgrađenih na porodičnom imanju u vlasništvu moje porodice<br>4. Iznajmljena kuća među nekoliko kuća izgrađenih na jednim imanju.<br>5. Stan (apartman) u vašem ili vlasništvu vaše porodice u blokovskoj zgradi<br>6. Iznajmljeni stan u blokovskoj zgradi<br>7. Drugo (molim navedite : _____) |

jedan odgovor

| | | |
|---|---|---|
| 34. | Molim vas označite redovni mesečni prihod vašeg doma ćinstva (ukoliko neki članovi vaše porodice imaju prihod, molim vas naznačite ukupnu sumu.) | 1. manje od 25,000 RDS mesečno<br>2. 25,000 do 49,999<br>3. 50,000 do 74,999<br>4. 75,000 do 99,999<br>5. 100,000 do 149,999<br>6. 150,000 do 199,999<br>7. 200,000 i više<br>8. Odbija da odgovori |

Slično

| | | |
|---|---|---|
| 35. | Da li primate bilo kakav dodatni prihod od članova porodice koji žive u inostranstvu? | 1. Ne.<br>2. Da. (prosečan godišnji iznos u evrima ) |

36 Imate li nešto da dodate što vas nismo pitali?

ZAPAŽANJA: _____

Take 1 ~ 4 photos of the site and upload please.

**HVALA VAM NA SARADNJI.**

# STEP 2

# STEP 2 Identification of Priority Issues

## 1 National Waste Management Program

**Table 17 National Waste Management Program**

| Goal , Objective , Measure | Description |
|---|---|
| General goal: | Development of a sustainable waste management system in order to reduce environmental pollution and degradation of space in accordance with EU regulations |
| Specific objective 1: | Improved municipal waste management system through increased recycling rate, reduced disposal of biodegradable waste in landfills and reduced disposal of waste in unsanitary landfills |
| Measure 1.1. | Extension of collection coverage to 100% |
| Measure 1.2. | Improvement of the system for separate collection and recycling of municipal waste |
| Measure 1.3. | Establishment of separate collection of biodegradable waste to reduce its disposal in landfills |
| Measure 1.4. | Establishment of new regional centers with sanitary landfills |
| Measure 1.5. | Introduction of economic instruments to encourage changes in the municipal waste management sector |
| Measure 1.6. | Closure and rehabilitation of existing non-sanitary landfills for municipal waste |
| Measure 1.7. | Conducting an information campaign on the municipal waste management system intended for citizens |
| Specific objective 2: | Established network of hazardous and industrial waste collection and treatment |
| Measure 2.1. | Establishment of a network for the collection of hazardous waste from HHs |
| Measure 2.2. | Capacity building for storage, treatment, and disposal of hazardous waste |
| Measure 2.3. | Identification, remediation and rehabilitation of contaminated sites |
| Specific objective 3: | Increased recycling rate of special waste streams and more efficient use of resources |
| Measure 3.1. | Establishment of collective operators for special waste streams (for waste from electrical and electronic equipment, used batteries and accumulators and waste |

| | |
|---|---|
| | vehicles, etc.) according to the principle of extended producer responsibility for the entire product life cycle |
| Measure 3.2. | Improving the network for collecting special waste streams |
| Measure 3.3. | Capacity building for treatment and disposal of special waste streams |
| Specific objective 4: | Strengthened capacities of institutions in the field of waste management and harmonized regulations with EU regulations |
| Measure 4.1. | Continue to align the legal framework with the EU acquis |
| Measure 4.2. | Strengthening administrative and institutional capacities for waste management |
| Measure 4.3. | Strengthening the capacity of the environmental inspection |
| Measure 4.4. | Improving monitoring and reporting in the field of waste management and further development of the information system |

## 2 Analysis of Current Status and Possible Measures of Sid Municipality in Relation to NWMP Targets

**Table 18 Extracts from the Analysis (1)**

| General goal: Development of a sustainable waste management system | | | | |
|---|---|---|---|---|
| Indicator | Sid Current Status 2021 | National Target 2031 | Current Status and Possible Measures of Sid Municipality | Priority |
| 1) Level of municipal waste disposed of in non-sanitary landfills | 96.6 % | 17.8% | The current landfill in Sid Municipality is not sanitary landfill (SLF), and improving it to SLF would be difficult. Therefore, in order to achieve this goal, it is essential to transport and dispose the waste that needs to be landfilled to the Srem- Macva Regional Landfill (RLF), which is SLF. The transition from the current landfill to the RLF will require a large investment in the development of a collection and transportation system, and will also significantly increase operational costs. Therefore, it is necessary to consider phasing the transition. In order to set the applicable target for Sid Mun., it is essential to select (a) target areas to be focused by 2024. | High |

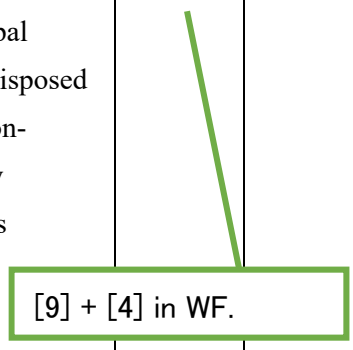


**Table 19 Extracts from the Analysis (2)**

| Indicator | Sid Current Status 2021 | National Target 2031 | Current Status and Possible Measures of Sid Municipality | Priority |
|---|---|---|---|---|
| Specific objective 1:<br>Improved municipal waste management system | | | | |
| 1) Rate of preparation for reuse and recycling of municipal waste (%) | 3.9 | 60 | The current reuse and recycling rate is very low compared to the national target of 60% by 2031. Efforts to improve the reuse and recycling rate (e.g., introduction of separate collection) should be initiated as soon as possible. | High |
| 2) Municipal waste recycling rate (%)<br>[2.1] + [2.2] + [2.3] + [2.4] in WF. | 3.9 | 35 | The current Recycling rate is very low compared to the national target of 35% for 2031.<br>Efforts to improve the recycling rate (e.g., introduction of separate collection) need to be initiated as soon as possible. | High |

How to know the current status of a municipality is shown in Reference No. 2 inserted at the end of STEP 2.

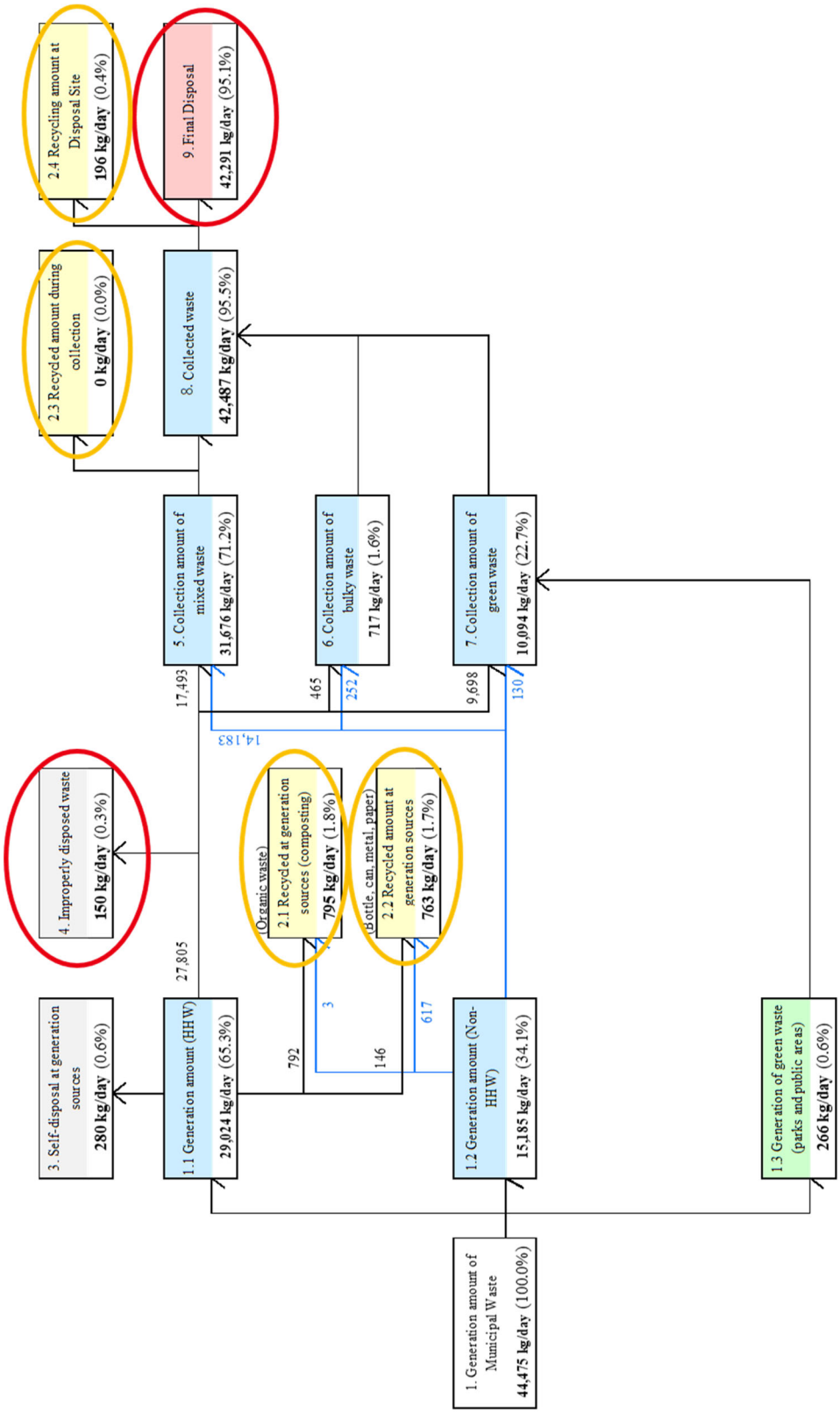



**Figure 11 Waste Flow to Analyse Possible Measures**

## 3 Priority Issues of Sid Municipality

As the result of the analysis, seven prioritized issues were identified.

**Table 20 Overview of Seven Priority Issues and Measures**

| No. | Priority issues | Possible measures |
|---|---|---|
| 1 | Final Disposal at Sanitary Landfill (SLFs) | Use of RLF |
| 2 | Participation in RWMS | Execution of contract to participate in regional waste management |
| 3 | Providing collection service for the whole municipality area | Expansion of collection service to Molovin Commune |
| 4 | Implementing separate waste collection system | |
| 5 | Reducing waste generation and promoting recycling at GS | Promotion of Home Composting, etc. |
| 6 | Reducing disposal of Biodegradable Waste | Promotion of Pruning GW Recycling |
| 7 | Securing proper locations for discharging and sorting hazardous municipal waste (HMW) and C&D Waste | Establishment of RY; same as “Waste Collection Center” in NWMP.) |

## Table 21 Priority Issues in Relation to NWMP

| Goals, Objectives, Measures in NWP | | Indicator | ty Issues of Sid Municipality | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **General goal:** | Development of a sustainable waste management system | Level of municipal waste disposed of in non-sanitary landfills | X | X | X | | | | |
| | | Level of disposed hazardous waste (%) | | | | X | | | |
| **Specific objective 1:** | Improved municipal waste management system | Rate of preparation for reuse and recycling of municipal waste (%) | | | | X | X | | |
| | | Municipal waste recycling rate (%) | | | | X | X | | |
| **Measure 1.1.** | EXtension of collection coverage to 100% | Average coverage of waste collection (%) | | | X | | | | |
| **Measure 1.2.** | Improvement of the system for separate collection and recycling of municipal waste | Degree of separately collected municipal waste (%) | | | | X | | | |
| | | Paper and cardboard recycling rate (%) | | | | X | X | | |
| **Measure 1.3.** | Establishment of separate collection of biodegradable waste to reduce its disposal in landfills | Biowaste recycling rate (%) | | | | | X | X | |
| **Measure 1.4.** | Establishment of new regional centers with sanitary landfills | Rate of biodegradable waste landfilled (%) of the total amount of biodegradable waste generated in 2008 | | | | | X | X | |
| **Measure 1.5.** | Introduction of economic instruments to encourage changes in the municipal waste management sector | *A pay-as-you-throw* tariff system has been established | | | | | X | | |
| **Measure 1.6.** | Closure and rehabilitation of eXisting non-sanitary landfills for municipal waste | Degree of closed unsanitary landfills (%) | X | X | X | | | | |
| **Measure 1.7.** | Conducting an information campaign on the municipal waste management system | Number of conducted information campaigns on the municipal waste management system | | | | | X | | |

| Goals, Objectives, Measures in NWP | | Indicator | Priority Issues of Sid Municipality | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Specific objective 2:** | Established network of hazardous and industrial waste collection and treatment | Constructed infrastructure for collection and treatment of hazardous and industrial waste | | | | X | | | X |
| **Measure 2.1.** | Establishment of a network for the collection of hazardous waste from households | Number of constructed centers for collection of hazardous waste from households | | | | X | | | X |
| **Specific objective 3:** | Increased recycling rate of special waste streams and more efficient use of resources | Degree of recycling of packaging waste (%) | | | | X | | | |
| | | Degree of recycling of construction and demolition waste (%) | | | | X | | | X |
| **Measure 3.2.** | Improving the network for collecting special waste streams | Degree of collection of waste batteries and accumulators (%) | | | | X | | | X |
| | | Degree of collection of waste from electrical and electronic equipment from households (%) | | | | X | | | X |
| **Measure 3.3.** | Capacity building for treatment and disposal of special waste streams | Degree of separately collected packaging waste (%) | | | | | | | X |
| **Specific objective 4:** | Strengthened capacities of institutions in the field of waste management and harmonized regulations with EU regulations | Compliance of regulations in the field of waste management with EU directives | | | | | | | |
| **Measure 4.1.** | Continue to align the legal framework with the EU acquis | Degree of adopted regulations in relation to the number planned for the implementation of the Program (%) | | | | | | | |
| **Measure 4.2.** | Strengthening administrative and institutional capacities for waste management | Number of signed inter-municipal agreements for the establishment of a waste management region | X | X | | | | | |
| | | Degree of developed new regional and local waste management plans (%) | X | X | | | | | |

**Reference No. 2**

## The National Targets of Indicators and How to Know the Indicators of the Municipality

*Please refer to the basic chart of Waste Flow in Page 6

| | Indicator | National Target 2031 | How to Know the Indicators of the Municipality from the Waste Flow (WF)* and Baseline Surveys |
|---|---|---|---|
| **General Goal: Development of a sustainable waste management system** | | | |
| | 1) Level of municipal waste disposed of in non-sanitary landfills | 17.8% | [9.] + [4.] in WF. |
| | 2) Level of disposed hazardous waste (%) | 80% | Not relevant to municipalities as hazardous waste disposal is out of their responsibility. However, it is advised to have data regarding how much hazardous waste is generated and collected from WACS and measurement at RY. |
| **Specific objective 1: Improved municipal waste management system** | | | |
| | 1) Rate of preparation for reuse and recycling of municipal waste (%) | 60% | [2.1] + [2.2] + [2.3] + [2.4] in WF,<br>and POS to know the behavior of reusing |
| | 2) Municipal waste recycling rate (%) | 35% | [2.1] + [2.2] + [2.3] + [2.4] in WF |
| Measure 1.1. Extension of collection coverage to 100% | | | |
| | Average coverage of waste collection (%) | 100% | Ratio of population covered by the municipal waste collection service to the population of the municipality. |
| Measure 1.2. Improvement of the system for separate collection and recycling of municipal waste | | | |
| | 1) Degree of separately collected municipal waste (%) | To be confirmed | [1.3 + 6.1] / [1.] in WF. |
| | 2) Paper and cardboard recycling rate (%) | 35% | [Amount of Recycled Paper & Cardboard] / [Generation of Paper & Cardboard].<br><br>[Amount of Recycled Paper & Cardboard] is from POS. It is also estimated from WACS of waste in blue bins/containers and the acceptance record at RMRF.<br>[Generation of Paper & Cardboard] is from total waste amount multiplied by paper and cardboard composition. |
| Measure 1.3. Establishment of separate collection of biodegradable waste to reduce its disposal in landfills | | | |
| | Bio-waste recycling rate (%) | 40% | [2.1] in WF. |
| Measure 1.4. Establishment of new regional centers with sanitary landfills | | | |

| | Indicator | National Target 2031 | How to Know the Indicators of the Municipality from the Waste Flow (WF)* and Baseline Surveys |
|---|---|---|---|
| | Rate of biodegradable waste landfilled (%) of the total amount of biodegradable waste generated in 2008 | 60% | (Estimated biodegradable waste generated in 2008 in your municipality) = (Biodegradable waste generated in 2008 in Serbia) * (% of Population in your municipality in 2008) Currently landfilled biodegradable waste amount can be estimated from WACS. In addition, GW from parks and public area may need to be measured if it is landfilled and not covered by WACS. |
| Measure 1.5. Introduction of economic instruments to encourage changes in the municipal waste management sector | | | |
| | 1) A pay-as-you-throw tariff system has been established | Yes | Yes or no, depending on the municipal ordinances. |
| | 2) Fee for waste disposal in unsanitary landfills introduced | Yes | Not applicable to the municipality level |
| Measure 1.6. Closure and rehabilitation of existing non-sanitary landfills for municipal waste | | | |
| | Degree of closed unsanitary landfills (%) | 80% | Number of closed unsanitary landfills/ Number of all damping sites in your municipality |
| Measure 1.7. Conducting an information campaign on the municipal waste management system | | | |
| | Number of conducted information campaigns on the municipal waste management system | 30 | A campaign is considered a series of activities organized under one objective. Thus at the municipality level, the number of campaigns would be either "1" or "0".<br>On the other hand, the POS conducted in Sid Municipality asked respondents about their experience participating in campaigns (environmental awareness activities). |
| **Specific Objective 2: Established network of hazardous and industrial waste collection and treatment** | | | |
| | Constructed infrastructure for collection and treatment of hazardous and industrial waste | Yes | Yes/ No<br>(It is necessary to secure discharge locations for Hazardous Waste from HHs in the Municipality, according to the NWMS) |
| Measure 2.1. Establishment of a network for the collection of hazardous waste from HHs | | | |
| | 1) Number of constructed centers for collection of hazardous waste from HHs | 151 | The Program states that measures need to be taken for HMW at the municipality level, such as installing adequate storage containers at a location adjacent to the Waste Collection Center or at any appropriate location. |

| | Indicator | National Target 2031 | How to Know the Indicators of the Municipality from the Waste Flow (WF)* and Baseline Surveys |
|---|---|---|---|
| | | | The Municipality needs to consider whether to set up a HMW collection point at a single location or multiple locations within the Municipality next to RYs.<br>(The HMW collected in these storage containers will then be collected by a licensed collector or delivered to a warehouse to be set up in the Region.) |
| | 2) Number of constructed regional warehouses of hazardous waste from HHs | 26 | The utilization of the regional warehouse will need to be considered after it will have been set up in the region.<br>Check if your region have a plan for a regional warehouse any time soon. |
| **Specific objective 3: Increased recycling rate of special waste streams and more efficient use of resources** | | | |
| | 1) Degree of recycling of packaging waste (%) | 70% | Specific questions need to be asked at POS. Otherwise, WACS with a specific category of "packaging waste". |
| | 2) Degree of recycling of C&D waste (%) | 40% | It is not considered as Municipal Waste, although securing a place for storing the construction waste from HHs is necessary to prevent improper discharge. |
| Measure 3.2. Improving the network for collecting special waste streams | | | |
| | 1) Degree of collection of waste batteries and accumulators (%) | 25 | If you already conduct separate collection of such waste, WACS should have such category and your Waste Flow should also include a flow of it. |
| | 2) Degree of collection of waste from electrical and electronic equipment from HHs (%) | 45 | At the municipality level, it is very difficult to estimate the generation amount of WEEE. The discharged amount of WEEE may be measured once a RY (Waste Collection Center) is established and weighing of such waste is conducted. |
| Measure 3.3. Capacity building for treatment and disposal of special waste streams | | | |
| | 1) A regulation has been adopted defining the manner of dealing with C&D waste | yes | Yes or no |
| | 2) Degree of separately collected packaging waste (%) | 100 | This can be measured from WACS result, if the Waste Types for WACS included recyclable packaging waste (plastic, paper, metal, glass). |
| **Specific objective 4: Strengthened capacities of institutions in the field of waste management and harmonized regulations with EU regulations** | | | |

| | Indicator | National Target 2031 | How to Know the Indicators of the Municipality from the Waste Flow (WF)* and Baseline Surveys |
|---|---|---|---|
| | 1) Compliance of regulations in the field of waste management with EU directives | yes | N/A<br>(A review is being conducted at the national level.<br>It will be necessary to update laws and regulations at the municipality level if necessary, once the national regulations will be updated.) |
| | 2) Harmonized reporting system on waste management with EUROSTAT according to EU regulations | yes | N/A<br>(The reporting system is being updated by SEPA. After the update, the municipal level data collection and reporting should be done according to the instructions.) |
| | 3) New regional companies formed | 10 | N/A<br>(Not applicable to a municipality level) |
| Measure 4.1. Continue to align the legal framework with the EU acquis | | | |
| | Degree of adopted regulations in relation to the number planned for the implementation of the Program (%) | 100 | N/A<br>(A review of the Law of Waste Management and other laws related to waste are being required at the national level. After enactment of relevant regulations at the national level, it is necessary for the municipality to take actions to comply with them.) |
| Measure 4.2. Strengthening administrative and institutional capacities for waste management | | | |
| | 1) Number of signed inter-municipal agreements for the establishment of a waste management region | 10 | If your municipality will join a RWMS, the agreement will need to be signed, stipulating the types of waste accepted by the regional facility and applicable fees for treatment, the conditions of measuring the volume (amount) of wastes, and other necessary conditions. |
| | 2) Degree of developed new regional and LWMPs (%) | 100 | For the municipality level, your answer will be Yes or No, depending on the status of local plan development. |
| Measure 4.3. Strengthening the capacity of the environmental inspection | | | |
| | Total number of trainings to strengthen the capacity of the waste management inspection | 10 | N/A<br>(After the system is established at the national level, the Municipal staffs will take part in when required.) |
| Measure 4.4. Improving monitoring and reporting in the field of waste management and further development of the information system | | | |
| | Monitoring and reporting system improved | Yes | N/A<br>(Implement reporting which is corresponding to SEPA's Monitoring system after its update.) |

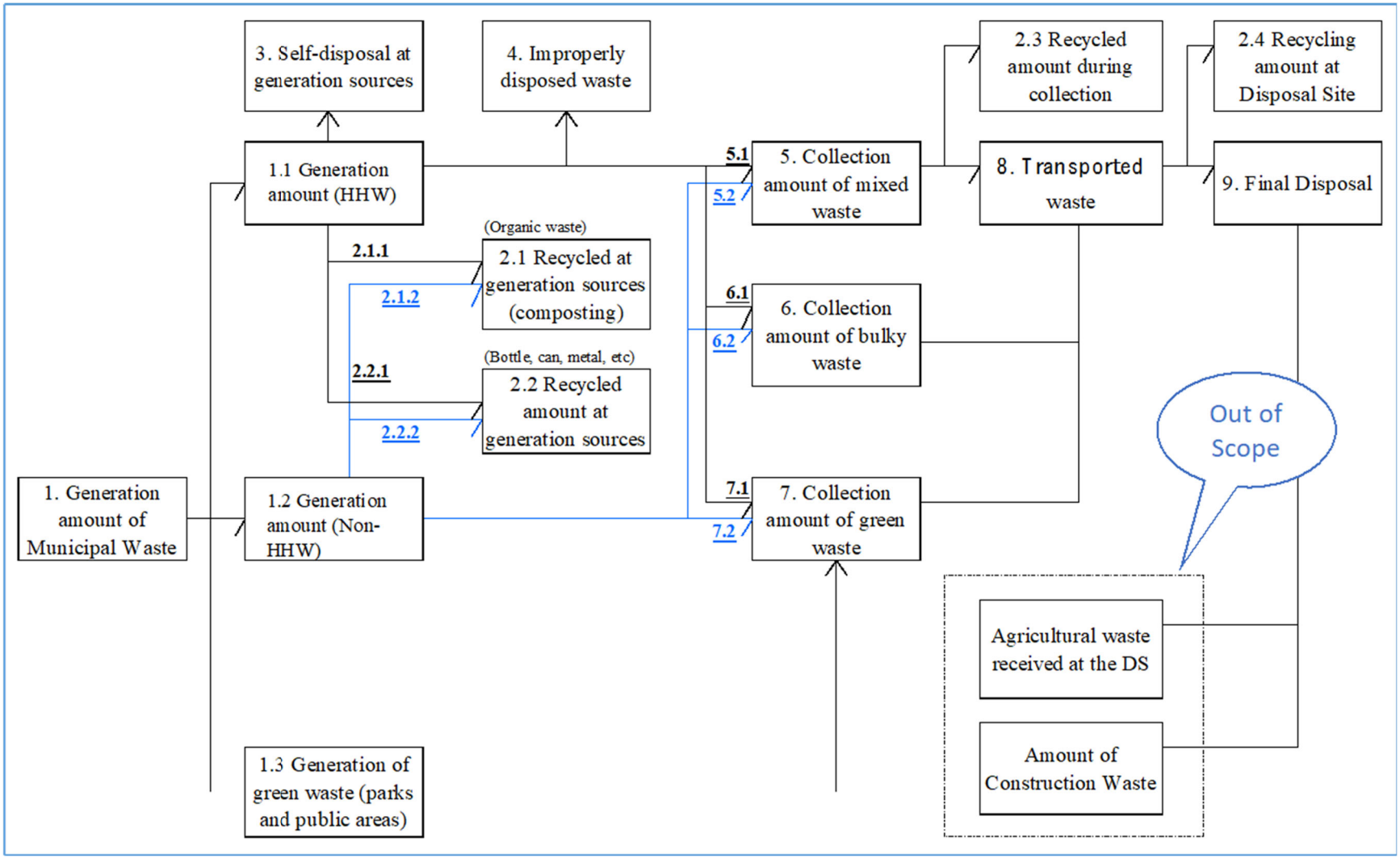



**Figure 12 Basic Chart of Waste Flow (without waste**

# STEP 3

# STEP 3 Examination of Alternatives to Participate in Regional Waste Management System

## 1 Comparison of Alternatives

### 1.1 Needs of Examination of Alternatives

- Sid has to participate in Regional Waste Management Center (RWMC) while it also needs to solve priority issues shown in Program 4.
- Solving the identified priority issues, especially the implementation of the separate collection system and the treatment and disposal of the separated waste at RWMC, will require a large-scale investment (containers, transport vehicles, etc.) and a large increase in operational cost (operation of transport vehicle to remote RWMC, tipping fee at RLF, etc.).
- The comparative examination of alternatives is needed to select the most suitable options for Sid municipality.

### 1.2 Process of Comparison of Alternatives

- Sid Municipality, PUC Standard, and JET had agreed to proceed the examination of alternatives in the following manners.

1. NWMP stipulates 2-stream waste separation of dry waste and wet waste, which are also rephrased to recyclable waste and mixed waste respectively.
2. Regarding collection, transportation, treatment, and disposal of the separated dry waste and wet waste, three alternatives for dry and four for wet waste respectively were examined to select the most suitable ones.

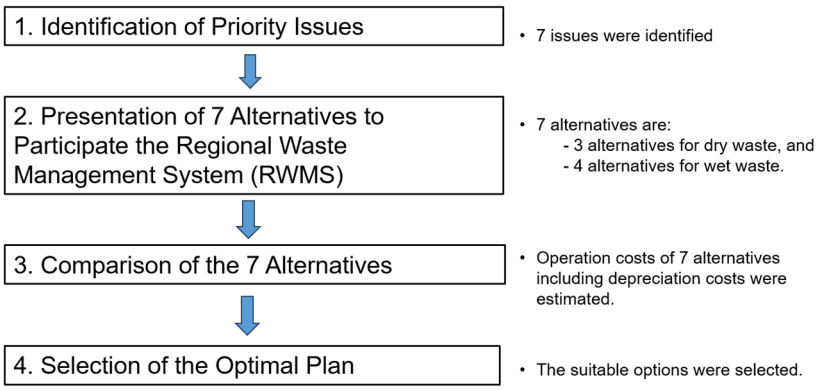



**Figure 13 Process of Comparison of Alternatives**

## 1.3 Alternatives for Dry (Recyclable) Waste

**D-Alt.1 (Direct Transportation to RWMC)**:

Dry waste collected by the large CT 20 $m^3$ provided by IPA will be transported directly to the **RWMC** for Material Recovery.

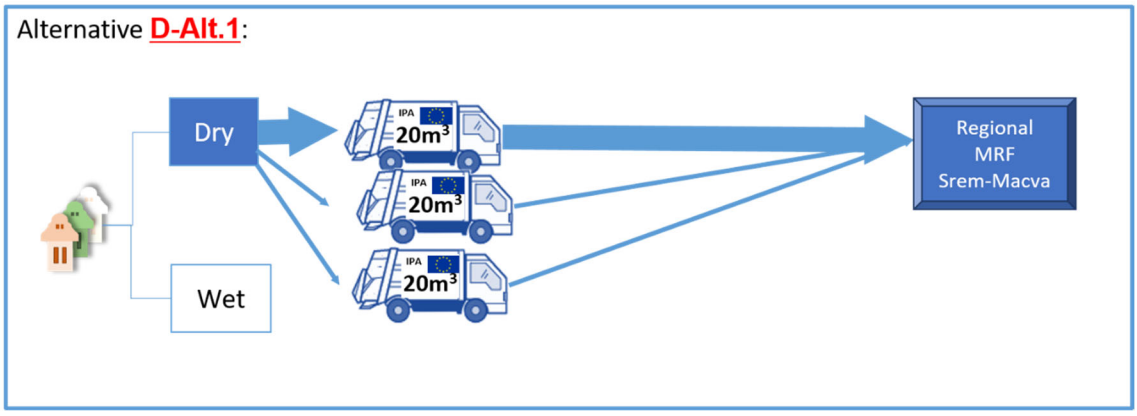



**Figure 14 Ilustration of Alternative D-Alt.1**

D-Alt.2 (Sorting at MRF in Sid, Redidue Transported to RLF):

The primary collected dry waste by the large CT 20$m^3$ will be transported to the **MRF** which will be constructed at the DS in Sid Municipality. The waste that can be sold is sorted and sold at the MRF, and the residue is transshipped to a large CT (22$m^3$) and transported to the **RLF**.


**Figure 15 Ilustration of Alternative D-Alt.2**

D-Alt.3 (Sorting at MRF, Redidue transshipped at TTTS to RLF):

The primary collected dry waste will be sorted at the **MRF** in Sid. The residue is transshipped to a Truck-with-Trailer (TT), which has two big containers (36 x 2 = 72m$^3$) at the Transfer Station (**TTTS**) which will be constructed at the DS in Sid Municipality and transported to the **RLF**.

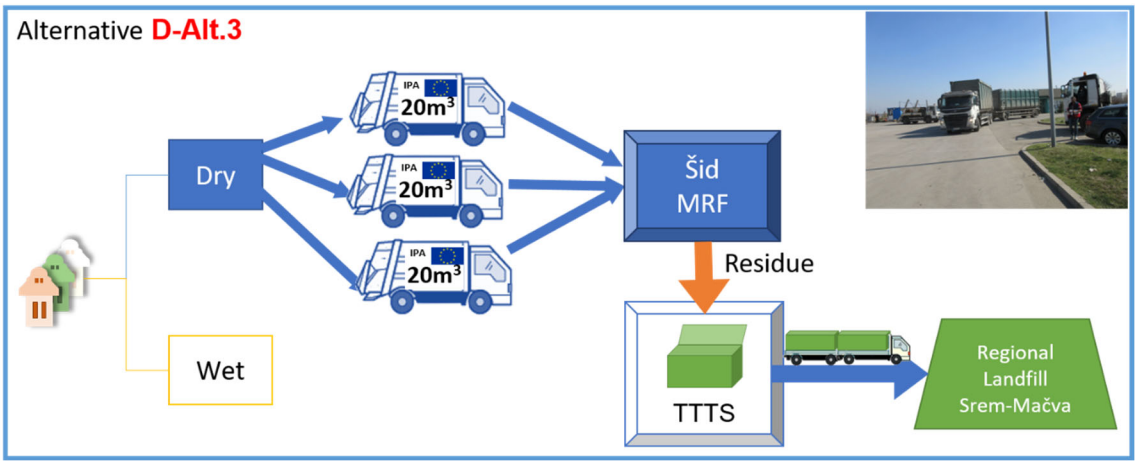



**Figure 16 Ilustration of Alternative D-Alt.3**

## 1.4 Alternatives for Wet Waste (1): W-Alt.1

W-Alt.1 (Direct Transportation to RLF):

22 m$^3$ CT of PUC will collect all wet waste and transport directly to the **RLF**. SL is used not for collecting Wet (Mixed) Waste, but for collecting Glass, GW, Bulky Waste from large containers (existing 5-10 m$^3$) placed in Waste Collection Center (WCC), etc.

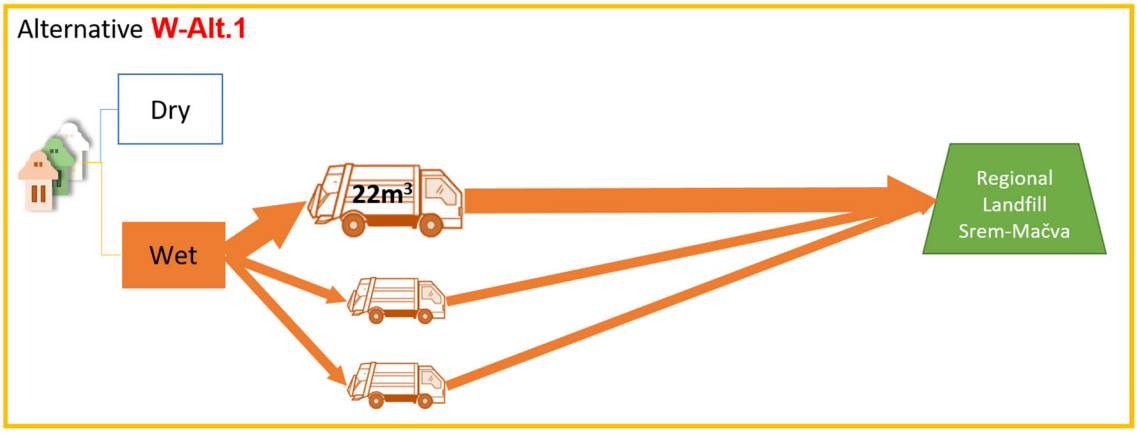



**Figure 17 Ilustration of Alternative W-Alt.1**

W-Alt.2 (All Wet Waste Transshipped at TTTS to RLF):

All wet waste collected will be transshipped to the large vehicle (TT 72m$^3$) at the **TTTS** to be constructed at the current Sid municipal landfill and transported to the **RLF**.

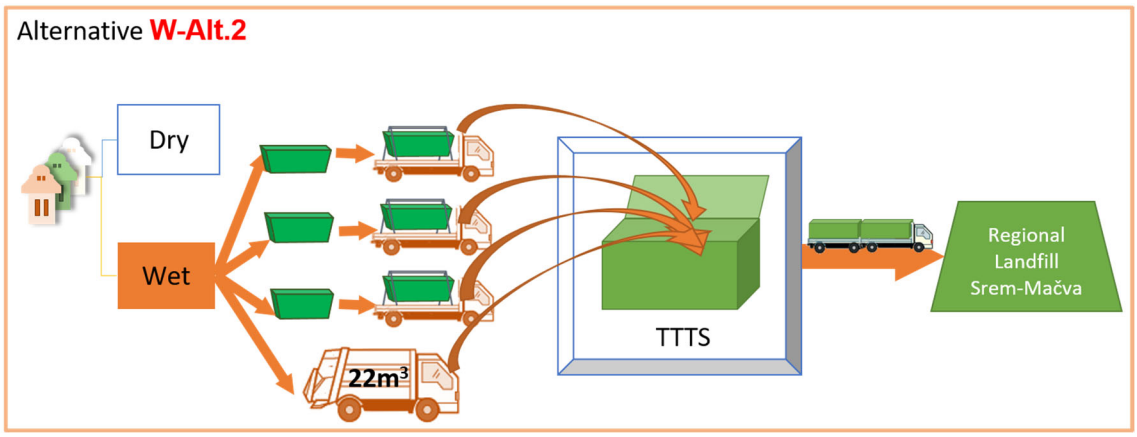



**Figure 18 Ilustration of Alternative W-Alt.2**

W-Alt.3 (Wet Waste Collected by the SL Transshipped at TTTS to RLF):
Only wet waste collected by the SL will be transshipped to the large vehicle (TT 72m$^3$) at the **TTTS** and transported to the **RLF**. The wet waste collected by the CTs will be transport directly to the **RLF**.

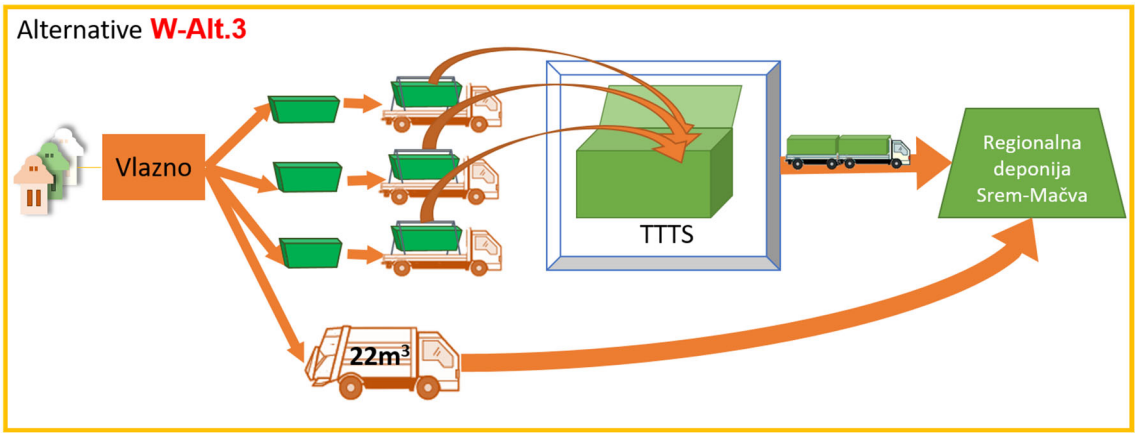



**Figure 19 Ilustration of Alternative W-Alt.3**

W-Alt.4 (Wet Waste Collected by the SL Transshipped at CT Transfer Station (CTTS to RLF):
Only wet waste collected by the SL will be transshipped to the large vehicle (CT 22m$^3$) at the **CTTS** to be constructed at the current Sid Municipal landfill and transported to the **RLF**. The wet waste collected by the CTs will be transport directly to the **RLF**.

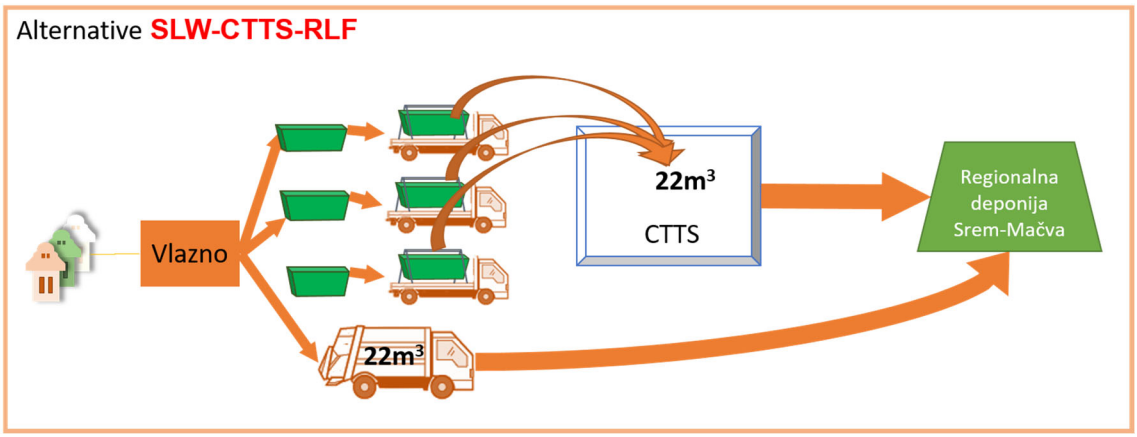



**Figure 20 Ilustration of Alternative W-Alt.4**

## 1.5 Comparison of 7 Alternatives

### 1) Process for Cost Comparison of Alternative Plans

1. To specify the amounts and composition of dry and wet wastes based on the result of WACS

   ➔See **2) Waste to be separately collected**

2. To measure the transportation distances from each of 19 communes to Sid municipal landfill and to the RWMC respectively, by Google Earth

   ➔See **3) Collection & Transportation Route**

3. To set 1) Movement speed, 2) Collection time, and 3) Average collection amount using the data from the T&M study by JET and the WB survey conducted by PUC in 2020.
4. To obtain data related to costs from PUC, including prices of equipment, cost of fuel and oil and cost for human resources.
5. To set the fees to be charged at Srem-Macva RWMC, i.e. **free** for treatment at MRF and **20€/ton** for the landfill.
6. To estimate the operational cost of each alternatives

### 2) Waste to be separately collected

17 waste types of the PUC were categorized into three according to the NWMP as shown below.

- Dry (Recyclable) Waste includes:

  1.Paper and cardboard, 2.PET, 3. Plastic bags, 4. Other plastics, 5. Aluminum cans, 6. Metal ferrous packaging, 7. Other metals.

- Wet (Mixed) Waste includes:

  9.Textile, 10. Composite materials, 11. Other packaging waste, 12. Rubber, 13. Fine particles, 14. Kitchen waste, 16. Other.

- Waste Other than Dry & Wet Wastes:

8. Glass, 15. GW, 17. Bulky waste (including WEEE)

*This category of waste is not considered in the process of comparison of alternatives.

Based on the waste types and categories mentioned above, waste amount and composition will be presented in the following table.

**Table 22 Waste to be Separately Collected**

| Category | Waste type | Generation (kg/day) | (%) |
|---|---|---|---|
| Dry waste | 1 Paper and cardboard | 4 542 | 10 3% |
| | 2 PET | 1 801 | 41% |
| | 3 Plastic bags | 1,715 | 39% |
| | 4 Other plastic | 703 | 16% |
| | 5 Aluminum cans | 910 | 21% |
| | 6 Metal ferrous packaging | 290 | 07% |
| | 7 Other metals | 401 | 09% |
| | Subtotal | 10,361 | 23.5% |
| Wet waste | 9 Textile | 1 133 | 26% |
| | 10 Composite materials | 59 | 01% |
| | 11 Other packaging waste | 193 | 04% |
| | 12 Rubber | 4 | 00% |
| | 13 Fine particles | 2 501 | 57% |
| | 14 Kitchen waste | 17,940 | 408% |
| | 16 Other | 5 308 | 12 1% |
| | Subtotal | 27,139 | 61.7% |
| Other waste | 8 Glass | 1 409 | 32% |
| | 15 GW | 3 375 | 77% |
| | 17 Bulky waste | 1,732 | 39% |
| | Subtotal | 6,517 | 14.8% |
| | Grand total | 44017 | 100.0% |

### 3) Collection & Transportation Route

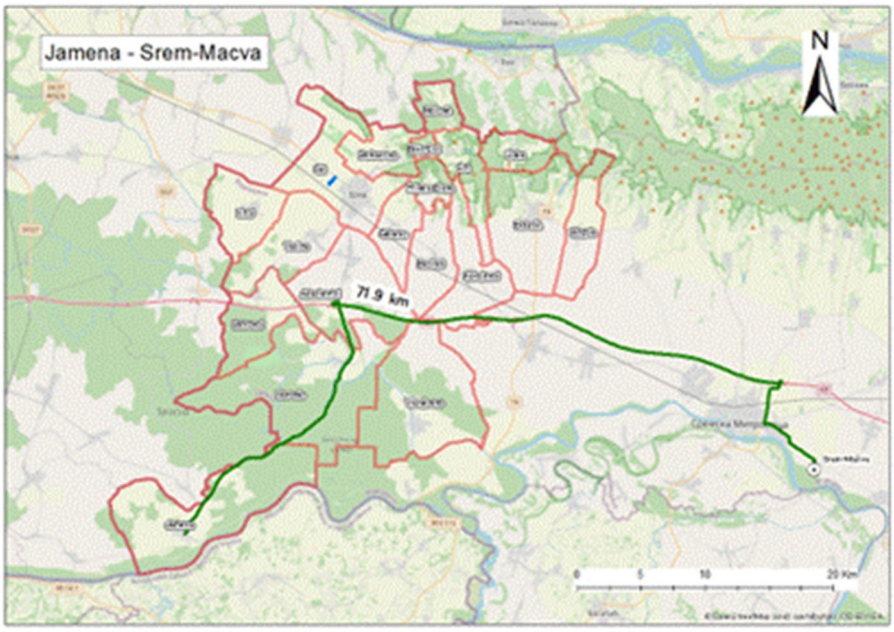



**Figure 21 Route from Jamena to RLF (71.9 km)**

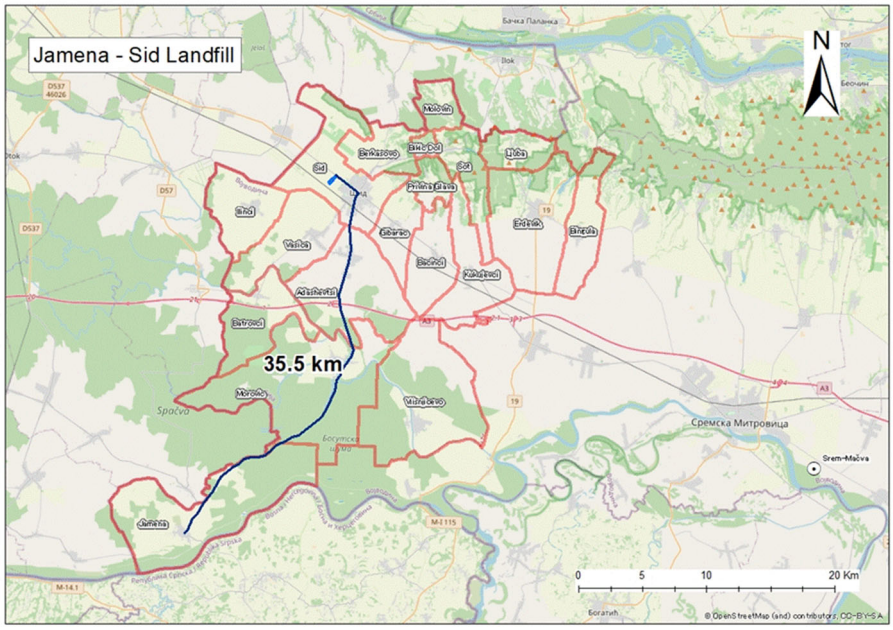



**Figure 22 Route from Jamena to Sid DS (35.5 km)**

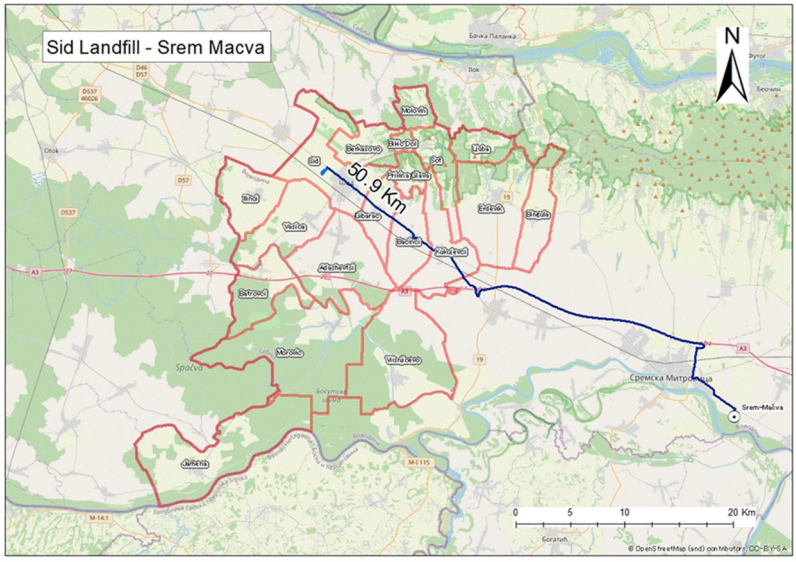



**Figure 23 Route from Sid DS to RLF (50.9 km)**

# 2 Selection of the Suitable Options

## 2.1 Selection of the Optimal Plan for Dry Waste

Amount of dry waste collected is 9.7 ton/day among 10.4 ton of generation.

**Table 23 Summary of Operation Cost for Dry Waste**

| Description | Unit | D-Alt.1 | D-Alt.2 | D-Alt.3 |
|---|---|---|---|---|
| 1.Collection (+ Transportation) Cost | RSD/year | 28,919,524 | 9,824,653 | 9,824,653 |
| 2. MRF in Sid Operation Costs | RSD/year | 0 | 6,165,257 | 6,165,257 |
| 3. TS in Sid Operation Costs | RSD/year | 0 | 0 | 6,251,400 |
| 4. Waste Transportation Costs from MRF or TS | RSD/year | 0 | 17,555,249 | 15,086,343 |
| 5. Selling Profit of Recyclables | RSD/year | 0 | -10,119,211 | -10,119,211 |
| 6. Tipping Fee for RMRF | RSD/year | 0 | 0 | 0 |
| **7. Tipping Fee for RLF** | **RSD/year** | **0** | **6,533,865** | **6,533,865** |
| Total = 1+2+3+4+5+6+7 | RSD/year | **28,919,524** | **29,959,812** | **33,742,306** |
| Unit Cost | RSD/ton | 8,185 | 8,480 | 9,550 |

Note: Depreciation cost of MRF and TS is included in each operation cost. Initial investment of those are excluded.

Findings of the Cost Comparison for Dry Waste:

1. In terms of operation cost, “D-Alt.1” in which dry waste is transported directly to RLF, would be the lowest. The 2nd lowest is “D-Alt.2”, “D-Alt.3” would be the most expensive.
2. In “D-Alt.1”, the tipping fee to be charged by RMRF is set as “0”, which makes the operation cost appear lower. If the tipping fee would be charged, the ranking of the operation costs among the two alternatives (D-Alt.1 and D-Alt.2) would be reversed.

Selection of the Optimal Plan for Dry Waste:

Sid Municipality and PUC selected “D-Alt.2” as their optimal plan for dry waste. The reasons are;

1. The citizens of Sid have never experienced waste separation. Therefore it is anticipated that they would not be able to meet the standard demanded by the RMRF.
2. If a MRF is established within the municipality, PUC will be able to control and improve the quality of the separated waste.

## 2.2 Selection of the Optimal Plan for Wet Waste

**Table 24 Summary of Operation Cost for Wet Waste**

| Description | Unit | W-Alt.1 | W-Alt.2 | W-Alt.3 | W-Alt.4 |
|---|---|---|---|---|---|
| 1.Collection (+ Transportation) Cost | RSD/year | 28,270,762 | 15,409,570 | 23,764,524 | 23,764,524 |
| 2. MRF Operation Costs | RSD/year | 0 | 0 | 0 | 0 |
| 3. TS Operation Costs | RSD/year | 0 | 7,198,158 | 4,961,646 | 3,698,906 |
| 4. Waste Transportation Costs | RSD/year | 0 | 19,283,009 | 9,493,657 | 10,175,422 |
| 5. Selling Profit of Recyclables | RSD/year | 0 | 0 | 0 | 0 |
| 6. Tipping Fee for RMRF | RSD/year | 0 | 0 | 0 | 0 |
| 7. Tipping Fee for RLF | RSD/year | 23,151,220 | 23,151,220 | 23,151,220 | 23,151,220 |
| Total = 1+2+3+4+5+6+7 | RSD/year | 51,421,982 | 65,041,957 | 61,371,047 | 60,790,073 |
| Unit Cost | RSD/ton | 5,197 | 6,574 | 6,203 | 6,144 |

Note: Depreciation cost of MRF and TS is included in each operation cost. Initial investment of those are excluded.

Findings of the Cost Comparison for Wet Waste:

1. In terms of operation cost,"W-Alt.1", in which the wet waste is directly transported to RLF, is the lowest. The second lowest would be "W-Alt.4", followed by "W-Alt.3" and "W-Alt.2".
2. In the cases with TS (W-Alt. 3 & 4), transshipping the waste from a SL to a large CT is more efficient than transshipping to TT.

Selection of the Optimum Plan for Wet Waste:

Sid Municipality and its PUC have selected "W-Alt.4" as their optimal plan for wet waste. The reasons are:

1. In "W-Alt.1" requiring the least operation cost, SL would not be used, which currently collects 25% of waste of Sid. SL is effective for conducting collection within a short range of distance and for collecting waste from large waste generators.
2. A collection system that uses CT instead of SL would require both the PUC and private waste generators using large containers (>5$m^3$) to invest in the procurement of 1.1 $m^3$ containers.

## 2.3 First Selection

- The option (TS + MRF in Sid) as shown below was selected at first.
- But it was cancelled due to the land issue.

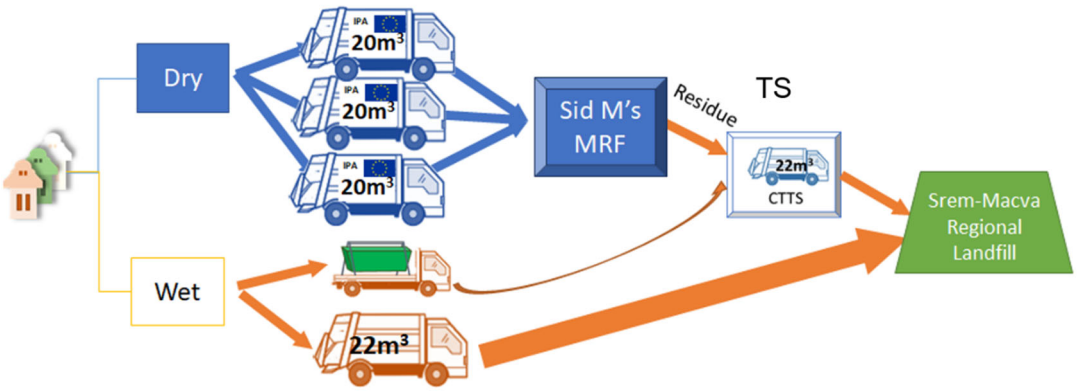



**Figure 24 Illustration of the Firstly Selected Plan**

## 2.4 Reselection of the Optimal Plan

- The construction of both TS and MRF in Sid was canceled as PUC could not acquire either the land ownership or the right to use.
- The second option (No TS for wet waste + No MRF in Sid for dry waste) as shown below replace the first option (TS + MRF in Sid) as the optimal one.

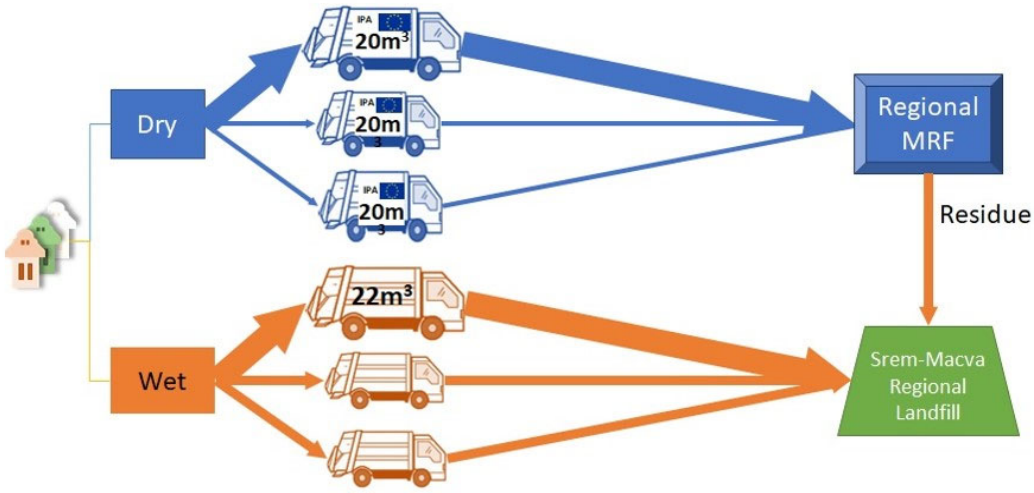



**Figure 25 Illustration of the Re-selected Plan**

## LESSONS LEARNT

What data are necessary to do the comparative examination?

- JET utilized data obtained from several field surveys presented previously and from other materials. Some of the important data for examination include:
  - **Waste:** Amount of waste to be transported or treated at each facility, density of waste in containers, and density of waste in CTs
  - **Trip:** Total length, number of trips, and waste transported in a single trip (for each truck)
  - **Speed and efficiency**: Moving speed, collection efficiency by types of collection/transportation, treating capacity of each facility or equipment
  - **Truck**: Types, payload, body volume, fuel consumption and number of trucks required for collection and transportation
  - **Prices**: Prices or unit costs of manpower, material, equipment and utilities, and construction costs of facilities.
- Some of the data used in this project may be applicable for other municipalities (Please refer to Reference No. 3).

When are the TS and MRF economical?

- In the case of Sid, JET compared the operation cost of:
  - Direct transport of dry waste and wet waste by CTs with large capacity (20-22 $m^3$) to RWMC, and
  - Transport of dry and wet waste via MRF and TS in the municipality.

It was found that the former costs less than the latter.

- This suggests that if the waste is collected by large CTs (20-22 $m^3$), direct transport to the RWMC without MRF or TS will be economical.

Which type of waste transfer is economical?

- The cost of following types of wet waste transfer was compared.
  - Waste is transshipped to TT (with two containers, 36 x 2 = 72$m^3$ = 11 ton), and
  - Waste is transshipped to CT (22$m^3$ = 8 ton).

It was found that waste transfer using CT costs less than that using TT.

- This is because:

TS using CT is smaller in size and requires smaller operation cost, even though CT less economical than TT if only the transport cost is compared.

**Reference No. 3**

**Indicators used in planning and cost estimations**

1. Truck Indicators

**Table 25 Carrying Capacity of CT**

| No | Plate No | Model | Body volume ($m^3$) | Trip waste (kg/trip) | Density (kg/$m^3$) |
|---|---|---|---|---|---|
| 1 | SI 001 MP | VOLVO | 8 | 3,976 | 497 |
| 2 | SI 001 OP | DAF | 16 | 6,630 | 414 |
| 3 | SI 036 FK | VOLVO | 12 | 5,545 | 462 |
| 4 | SI 041 HJ | IVECO | 12 | 6,951 | 579 |
| 5 | SI 035 IL | VOLVO | 22 | 7,801 | 355 |
| 6 | SI 038 JV | MAN | 20 | 6,428 | 321 |
| | Average | | | | 438 |

Note: Results of PUC's WB survey (2020), RLF's WB data for Nov 2023

**Table 26 Fuel Consumption**

| No | Plate No | Model | Body volume ($m^3$) | Fuel consumption (liter/km) | Remark |
|---|---|---|---|---|---|
| 1 | SI 001 MP | VOLVO | 8 | 0.3 | CT |
| 2 | SI 001 OP | DAF | 16 | 0.5 | CT |
| 3 | SI 036 FK | VOLVO | 12 | 0.6 | CT |
| 4 | SI 041 HJ | IVECO | 12 | 0.4 | CT |
| 5 | SI 035 IL | VOLVO | 22 | 0.7 | CT |
| 6 | SI 038 JV | MAN | 20 | 0.7 | CT |
| 7 | ŠI 021 RB | VOLVO | 5 to 10 | 0.4 | SL |

**2. Indicators related to Waste Collection and Transportation**

**Table 27 Indicators Related to Waste Collection and Transportation**

| No | Indicators | Unit | Values | Remark |
|---|---|---|---|---|
| 1 | Operation speed: | | | |
| | Collection speed (door-to-door) | kg/hour | 2,206 | Average estimated from the T&M survey data (2021) |
| | Collection speed (1m$^3$ container) | kg/hour | 3,643 | Average estimated from the T&M survey data (2021) |
| | Collection hour (SL) | hour/trip | 0:15 | GPS measure (the result of the T&M survey conducted in 2021) |
| | Movement speed (outside CAs) | km/hour | 31 | SL's moving speed (GPS measure) |
| 2 | Waste density: | | | |
| | Recyclable waste in CT | kg/m$^3$ | 200 | The result of the PP on Separate Collection conducted by JICA in Mongolia in 2011 |
| | Recyclable waste in containers | kg/m$^3$ | 50 | The result of the PP on Separate Collection conducted by JICA in Mongolia in 2011 |
| | Landfilled waste (LW) in CT | kg/m$^3$ | 438 | Overall average calculated from the PUC's WB survey and Srem Macva's WB data of December 2023 |
| | LW in containers | kg/m$^3$ | 110 | HHW; Result of T&M survey conducted under PP3 in December 2023 |
| 3 | Waste collected under Door-to-Door collection (waste per km of streets) | kg/km | 2000 | Based on T&M survey conducted by JET in 2021 and the Weighbridge survey conducted by PUC in 2020 |

### 3. Indicators related to Equipment and Facility

**Table 28 Indicators Related to a TS**

| No | Indicators | Unit | Values | Remark |
|---|---|---|---|---|
| 1 | Equipment prices: | | | |
| | TT | RSD/set | 19,159,322 | Based on quotation |
| | Container (36 $m^3$) | RSD/unit | 879,675 | Open-top container. Based on interview with Sabac TS. |
| | Wheel loader (125 kw) | RSD/unit | 9,676,425 | Based on quotation received by JET |
| 2 | TS facility construction cost | RSD | 13,671,640 | JET estimation |
| 3 | Duration of loading one 36 $m^3$ container | hours/pc | 0:40 | Based on interview with Sabac TS. |
| 4 | Fuel consumption of TS equipment: | | | |
| | Engine power of wheel loader | kW | 125 | Based on the interview with PUC. |
| | Wheel loader | liter/kWh | 0.153 | |
| | Container truck without trailer | liter/km | 0.7 | Based on the interview with Sabac TS |
| | Container TT | liter/km | 1.0 | JET assumption |
| 5 | Movement speed of trailer truck | km/hour | 31 | SL's moving speed is adopted. |

**Table 29 Material Recovery Facility (MRF) and Recycling Yard (RY)**

| No | Indicators | Unit | Values | Remark |
|---|---|---|---|---|
| | MRF: | | | |
| 1 | Equipment price: | | | |
| | Belt conveyor | RSD/set | 4,632,955 | Based on quotations received by JET |
| | Pressing and bailing machine | | | |
| 2 | MRF facility construction cost | RSD | 12,768,952 | JET estimation |
| 3 | Power consumption: | | | |
| | Belt conveyor | kW | 0.55 | Considered to be the same as that of Sremska-Mitrovica's MRF (0.55 kw). |
| | Pressing and bailing machine | kW | 12.60 | Considered to be the same as that of Sremska-Mitrovica's MRF (Conveyor-5.10 kw; Presser/Bailing-7.5kW). |
| | RY: | | | |
| 1 | Equipment price: | | | |
| | WB | RSD/set | 3,276,000 | 28,000 euro (WB and control house, including their construction costsl (Solar panel, septic tank and water supply line installation/extension costs are not included). |
| | Control house | | | |
| 2 | RY facility construction cost | RSD/set | 9,802,851 | Result of the tender organized by the Municipality of Sid |

**4. Other Indicators and Prices used in Cost Estimation**

**Table 30 Other Indicators**

| No | Indicators | Unit | Value | Remark |
|---|---|---|---|---|
| 1 | Asset depreciation period | | | |
| | Facility | years | 30 | Depreciation period applied by PUC |
| | Vehicles/Wheel loader/trailers | years | 20 | Depreciation period applied by PUC |
| | Containers | years | 10 | JET assumption |
| 2 | Estimation factor for equipment maintenance cost | per cent | 5.6% | Share of annual maintenance cost in the equipment price. Estimated from the PUC's cost report for the year 2020. |
| 3 | Fuel price | RSD/liter | 192.5 | Market price of EuroDiesel as of 6 April 2022 (www.benzinko.com) |
| 4 | Lubricant price | RSD/liter | 1,000.0 | Market price of engine oil as of 6 April 2022 (www.benzinko.com) |
| 5 | Lubricant / Fuel ratio | ratio | 5% | Based on the interview with PUC. |
| 6 | Electricity price | RSD/kWh | 8.41 | Single rate for "Blue zone" consumer (between 351 and 1,600 kWh/month) |
| 7 | Work and equipment consumables | RSD/unit*week | 8,299 | Estimated from the PUC's cost report for the year 2020 |
| 8 | RLF tipping fee | RSD/ton | 2,808 | Based on the interview with the RLF 24 euro/ton (tax included); 1 euro=117 RSD |
| 9 | Highway fee | RSD/trip | 1,300 | From Sid to RLF (tariff for 20 $m^3$ CT was adopted) |
| 10 | Other fixed costs: | | | |
| | Employees insurance against accidents | RSD/psn*week | 20 | Estimated from the PUC's cost report for the year 2020 |
| | Vehicle insurance against accidents | RSD/truck*week | 467 | Estimated from the PUC's cost report for the year 2020 |
| | Technical inspection cost | RSD/truck*week | 153 | Based on interview with PUC |
| | Vehicle registration fee | RSD/truck*week | 58 | Based on interview with PUC |

# STEP 4

# STEP 4 Development of Technical Plan

## 1 Framework for Planning Action Plan (A/P)

### 1.1 Population

- Results of Census 2022:
  - Sid Municipality: 28,404 people (refugees included)
  - Sid Commune: 12,688 people (refugees included)
- Assumption applied to the A/P
  - There has been no significant change in the population of the municipality in recent years
  - The 2024 populations of Sid Municipality and Sid Commune are assumed to be the same as those of 2022.

### 1.2 Waste Amount & Composition

- **The amount and composition of MSW in 2024** are presumed to be consistent with the estimates made for 2022.
  1. Amount of MSW in 2024:
     - Sid Municipality: 44.475 ton/day
     - Sid Commune: 27.119 ton/day
  2. Composition of MSW in 2024:
     - Sid Municipality: (Table 31)
     - Sid Commune: (
     - Table 32)
- **The main feature of Sid Commune:**
  1. Sid Commune accounts for **45%** of Sid Municipality's population but generates **60%** of the municipality's waste.
  2. This disproportion is due to the concentration of business enterprises in the commune, which are the primary sources of Non-HHW.

**Table 31 Composition of MSW in Sid Municipality in 2024**

| No | Types | Municipal solid waste | | Recyclable waste | | Landfilled waste | | Specific waste | |
|---|---|---|---|---|---|---|---|---|---|
| | | (kg/day) | (%) | (kg/day) | (%) | (kg/day) | (%) | (kg/day) | (%) |
| 1 | Paper and Cardboard | 5,264 | 11.84% | 2,092 | 4.70% | 3,172 | 7.13% | | |

| No | Types | Municipal solid waste | | Recyclable waste | | Landfilled waste | | Specific waste | |
|---|---|---|---|---|---|---|---|---|---|
| | | (kg/day) | (%) | (kg/day) | (%) | (kg/day) | (%) | (kg/day) | (%) |
| 2 | Plastic | 5,319 | 11.96% | 2,100 | 4.72% | 3,219 | 7.24% | | |
| 3 | Metal | 1,227 | 2.76% | 960 | 2.16% | 267 | 0.60% | | |
| 4 | Textile | 1,198 | 2.69% | | | 1,198 | 2.69% | | |
| 5 | Rubber | 189 | 0.42% | | | 189 | 0.42% | | |
| 6 | Fine particles | 3,616 | 8.13% | | | 3,616 | 8.13% | | |
| 7 | Kitchen waste | 11,360 | 25.54% | | | 11,360 | 25.54% | | |
| 8 | Other waste | 1,571 | 3.53% | | | 1,571 | 3.53% | | |
| 9 | Glass | 2,968 | 6.67% | 1,768 | 3.97% | | | 1,200 | 2.70% |
| 10 | GW | 11,041 | 24.83% | | | | | 11,041 | 24.83% |
| 11 | Bulky waste | 140 | 0.31% | | | | | 140 | 0.31% |
| 12 | WEEE | 22 | 0.05% | | | | | 22 | 0.05% |
| 13 | HMW | 54 | 0.12% | | | | | 54 | 0.12% |
| 14 | C&D waste | 506 | 1.14% | | | | | 506 | 1.14% |
| | Total | 44,475 | 100.00% | 6,921 | 15.56% | 24,591 | 55.29% | 12,964 | 29.15% |

Note: The amount of recyclable, landfilled and specific waste for types 11, 12, 13, and 14 was based on Environmental Infrastructure Support Program (EISP), 2015 ("Report on Quantities and Morphological Composition of Waste for 9 Representative Municipalities in Serbia"). The amount for the remaining types was based on the results of the WACS conducted by PUC on 5 Sep 2023, with some assumptions set by JET.

**Table 32 Composition of MSW in Sid Commune in 2024**

| No | Types | Municipal solid waste | | Recyclable waste | | Landfilled waste | | Specific waste | |
|---|---|---|---|---|---|---|---|---|---|
| | | (kg/day) | (%) | (kg/day) | (%) | (kg/day) | (%) | (kg/day) | (%) |
| 1 | Paper and Cardboard | 4,191 | 15.45% | 1,666 | 6.14% | 2,525 | 9.31% | | |
| 2 | Plastic | 3,674 | 13.55% | 1,450 | 5.35% | 2,223 | 8.20% | | |
| 3 | Metal | 1,003 | 3.70% | 785 | 2.89% | 218 | 0.80% | | |
| 4 | Textile | 566 | 2.09% | | | 566 | 2.09% | | |
| 5 | Rubber | 143 | 0.53% | | | 143 | 0.53% | | |

| No | Types | Municipal solid waste | | Recyclable waste | | Landfilled waste | | Specific waste | |
|---|---|---|---|---|---|---|---|---|---|
| | | (kg/day) | (%) | (kg/day) | (%) | (kg/day) | (%) | (kg/day) | (%) |
| 6 | Fine particles | 1,777 | 6.55% | | | 1,777 | 6.55% | | |
| 7 | Kitchen waste | 6,670 | 24.60% | | | 6,670 | 24.60% | | |
| 8 | Other waste | 988 | 3.64% | | | 988 | 3.64% | | |
| 9 | Glass | 2,482 | 9.15% | 1,478 | 5.45% | | | 1,003 | 3.70% |
| 10 | GW | 5,141 | 18.96% | | | | | 5,141 | 18.96% |
| 11 | Bulky waste | 94 | 0.35% | | | | | 94 | 0.35% |
| 12 | WEEE | 15 | 0.05% | | | | | 15 | 0.05% |
| 13 | HMW | 36 | 0.13% | | | | | 36 | 0.13% |
| 14 | C&D waste | 339 | 1.25% | | | | | 339 | 1.25% |
| | Total | 27,119 | 100.00% | 5,380 | 19.84% | 15,110 | 55.72% | 6,629 | 24.44% |

Note: The amount of recyclable, landfilled and specific waste for types 11, 12, 13, and 14 was based on EISP, 2015 ("Report on Quantities and Morphological Composition of Waste for 9 Representative Municipalities in Serbia"). The amount for the remaining types was based on the results of the WACS conducted by PUC on 5 Sep 2023, with some assumptions set by JET.

### 1.3 Waste Flow

The Waste Flow in Sid Municipality and in Sid Commune as of 2022 (before the Action Plan) are indicated in the following pages.

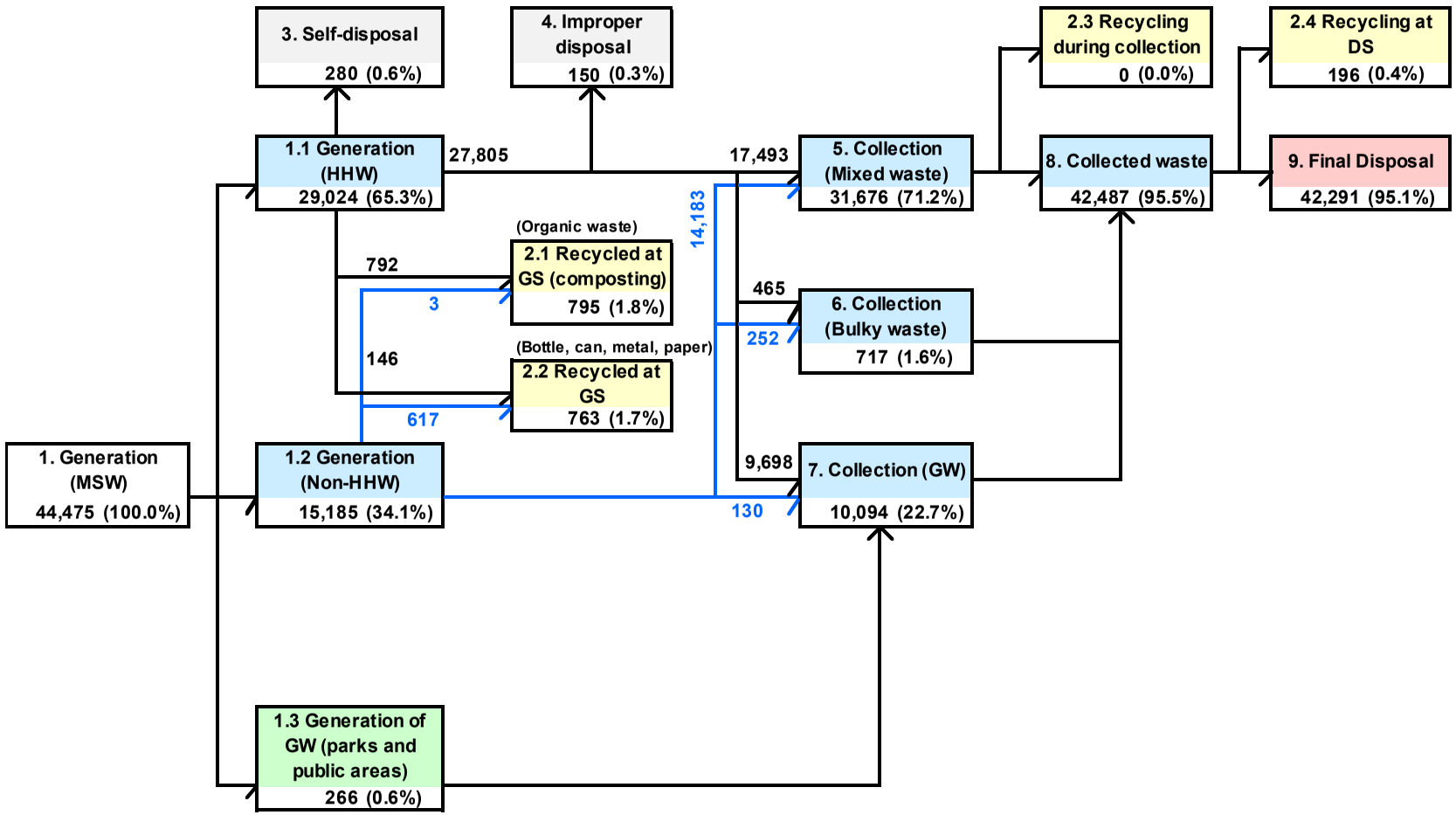



**Figure 26 Waste Flow in Sid Municipality, 2022 (kg/day)**

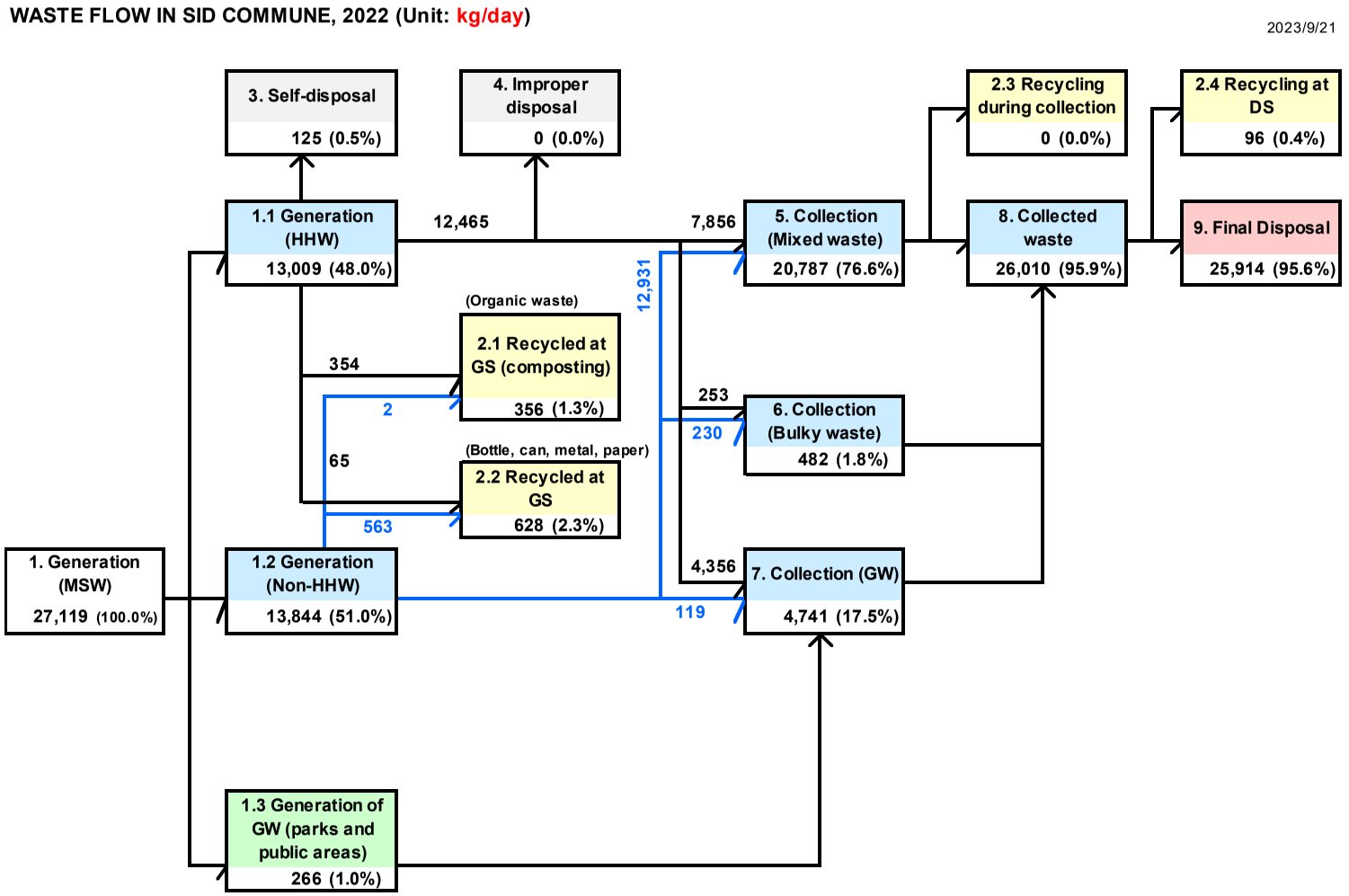



**Figure 27 Waste Flow in Sid Commune, 2022 (kg/day)**

### 1.4 Target of A/P

The A/P will be incorporated into the LWMP to be formulated by Sid Municipality (Sid LWMP).

- Target Years:
  - Sid LWMP: 2031 (the target year of the NWMP is 2031)
  - A/P: 2024
- Target Area
  - A significant increase in waste management costs is unavoidable as a result of participation in the RWMS.
  - Waste management costs are borne by the beneficiaries, the citizens, as the service fee.
  - It is challenging to raise the fee significantly. Therefore, **the target area of the A/P shall be limited to Sid Commune**.
  - Based on the results of the A/P implementation, **the improvement plan will be gradually expanded to the entire municipality through the Sid LWMP.**

### 1.5 Composition of A/P

The MSWM system consists of technical and institutional systems. In order to operationalize the plans of Technical System (**Technical plan**) and of the Institutional System (**Institutional System Plan**) is prepared.

- Technical Plan includes:
  1) Waste management system
  2) Numerical Targets
  3) Waste Flow
- Institutional System Plan includes:
  1) Plan of rules and Regulations
  2) Organizational Plan
  3) Financial Plan

## 2 Waste Management System

- Sid Municipality and PUC agreed that the waste categories applied to the A/P would also be adopted in Sid LWMP.
- The JET worked closely with the PUC to outline the management systems (discharge, collection, treatment, and transportation systems) for each type of MSW.

## Table 33 Waste Categories Applied to the A/P

| Rule Book No | Waste Types | Recyclable Waste | | Landfilled Waste | | Specific Waste | |
|---|---|---|---|---|---|---|---|
| | | Discharge Container | Waste Types | Discharge Container | Waste Types | Discharge Container | Waste Types |
| 1, 11 | Paper and cardboard | Blue Container or Bin | Cardboard boxes, paper wrappers & labels, paper bags, multilayer cardboard packaging for beverage, white paper & notebooks, newspaper | Currently used Container or Bin | Paper wastes other than the recyclables on the left | | |
| 3 | Plastic | | Plastic bottles for water and juices, plastic containers, PET packages, plastic caps and lids | | Plastic wastes other than the recyclables on the left | | |
| 2 | Metal | | Drink cans, food cans, metal caps & lids | | Metal waste other than the recyclables on the left | | |
| 8 | Textile | | | | All textile | | |
| 12 | Rubber | | | | All rubber | | |
| 6, 15 | Fine particles | | | | All fine particles | | |
| 5 | Kitchen waste | Compost bin | (Optional) Waste suitable for composting such as vegetable and fruit scraps and coffee grounds. | | All kitchen waste (if not composted) | | |
| 13, 14, 17, 18, 19 | Other waste | | | | All waste that cannot be classified | | |
| 4 | Glass | Yellow Container | Glass bottles and jars | | | RY | Glass material other than bottles or jars such as windows and mirrors. |
| 5 | GW | Compost bin | (Optional) Waste suitable for composting such as fallen leaves and chipped branches. | Currently used Container or Bin | Non-pruning waste (PW; fallen leaves) | Call PUC or RY | PW (to be chipped) |
| 7, 16 | Bulky waste | | | | | Call PUC or RY | Furniture, music instrument, tire, etc. |
| 10 | WEEE | | | | | Call PUC or RY | Fridge, TV, AC, washing machine, mobile phone, etc. |
| 9 | HMW | | | | | RY | All HMW such as cell batteries, car batteries, tube lights, paint and paint containers, etc. |
| Non | C&D waste | | | | | RY | All C&D waste (subject to prior approval by PUC) |

**Table 34 Recyclable Waste (RW) Management**

| Collection Type | Point of Collection | Type of Container | Collection Frequency | Collection and Transport Vehicle | Destination for Treatment | Residue Disposal |
|---|---|---|---|---|---|---|
| Door to Door Collection | HH1 (Detached houses) | 240 L blue bin | 1 time /month | 20m$^3$ CT | MRF at RWMC | RLF at RWMC |
| | Non-HH | 240 L blue bin | 1 time /month | | | |
| | HH2 (Apartment complexes) | 240 L blue bin | 1 time /month | | | |
| Container Collection | HH2 | 1.1 m$^3$ BLUE container | 3 times/week | | | |
| | Non-HH | 1.1 m$^3$ BLUE container | 1 time /week, on demand | | | |
| | Recycling Island (RI) | 1.1 m$^3$ BLUE container | 3 times /week | | | |

**Table 35 LW Management**

| Collection type | Point of Collection | Type of Container | Collection Frequency | Collection and Transport Vehicle | Destination |
|---|---|---|---|---|---|
| Door to Door Collection | HH1 (Detached houses) | Green bin (Current) | 1 time/week | 12 - 22 m$^3$ CT | RLF |
| | Non-HH | Green bin (Current) | 1 time/week | | |
| Container Collection | HH2 (Apartment complex) | 1.1 m$^3$ STEEL container | 3 times/week | 22 m$^3$ CT | RLF |
| | Non-HH | 1.1 m$^3$ STEEL container | 1 time/week | | |
| | Non-HH (> 5m$^3$ owned by private) | > 5m$^3$ owned by private | 1 time/week On-demand | SL | Sid DS* |
| | RI | 1.1 m$^3$ STEEL container | 1 to 2 times/day | 22 m$^3$ CT | RLF |

Note: 39% of the large containers (with capacities of 5 m$^3$ and more) are planned to be replaced with 1.1 m$^3$ containers (27 out of 70 pcs).

**Table 36 Glass Waste Management**

| Type of Waste | Point of Collection | Type of Container | Collection Frequency | Collection Provider (Vehicle) & Destination | Treatment & Final Disposal |
|---|---|---|---|---|---|
| Recyclable Glass | RI | 1.1$m^3$ Yellow Container | Depending on necessity | PUC (20 $m^3$ CT) to RY nearby Sid Landfill | - |
| | RY nearby Sid DS | Container provided by Private Company (PC) | Depending on necessity | PC to its Recycling Factory (To be discussed with the PC) | Recycling Factory of the PC |
| Non-Recyclable Glass | RY | 5$m^3$ container | Depending on necessity | PC to its premises (To be discussed with the PC) | Treatment Factory of the PC |

**Table 37 PW/GW Management**

| GS | Discharge Method | Service Fee | Transport Vehicle for Chipping Machine | Management of Chipped GW |
|---|---|---|---|---|
| Small Generators | Chipping service on Call. | Free | PUC provides the chipping service with chipping machine in front of generator. | Generator is promoted to use the chipped PW/GW at HH. If difficult, PUC takes it to the Sid DS for future use. |
| Large Generators | Chipping service on Call. | To be charged | PUC provides the chipping service with chipping machine in front of generator. | Generator is promoted to use the chipped PW/GW at HH. If difficult, PUC takes it to the Sid DS for future use. |
| Any generators | Generators discharge PW/GW at RY | Free | Chipping at the RY by PUC | Piled up at the Sid DS. |
| Public Area | None | None | For annual pruning work, PUC provides the chipping machine. For other cases, only collection vehicle be provided. | Used for mulching in public area. Piled up at the Sid DS. |

The management methods of GW other than PW are as follows:

- The generator composts it at the source or otherwise disposes of it as MW. Sid City/PUC will encourage composting at the source through public relations and awareness activities.
- When discharging waste because it cannot be composted at the source, it is recommended that it be disposed of together with PW/GW as much as possible. (then PUC brings it to RY)
- If the above method cannot be used, the generator discharges it together with MW.

**Table 38 Bulky Waste Management**

| Discharge and Collection Method | Service Fee | Collection Frequency | Collection and Transport Vehicle | Treatment and Disposal |
|---|---|---|---|---|
| Door to Door collection by PUC on call | Free at preset but future be charged | Once a month | Tractor with trailer or Truck | Segregation at RY and Residues to the RLF |
| Generator discharges Bulky Waste into a Large Container installed at RY | Free | Not necessary | Not necessary | Segregation at RY and Residues to the RLF |

**Table 39 WEEE, HMSW and C&D Waste Management**

| Type of Waste | Discharge Method | Type of Container | Service Fee | Collection and Transport Vehicle | Treatment and Disposal |
|---|---|---|---|---|---|
| WEEE | RY | PUC or a PC to place containers | Free | From RY to treatment: PC | PC |
| | On-call collection by PUC (for residents who cannot transport WEEE to RY by themselves) | Not necessary | Free | From generator to RY: PUC<br>From RY to treatment: PC | PC |
| HMW | RY | PUC or a PC to place a special container | Free | PC to transport from RY for treatment | PC |
| C&D Waste | Small Generator (Not Construction | By request, PUC to | To be Charged | PUC to provide a tipper or a SL | Sid DS |

| Type of Waste | Discharge Method | Type of Container | Service Fee | Collection and Transport Vehicle | Treatment and Disposal |
|---|---|---|---|---|---|
| | Company): On-call collection by PUC | provide 5m$^3$ containers | | | |
| | Large Generator (Construction Company): PUC may provide 5m$^3$ Container by the request | By request, PUC to provide 5m$^3$ containers | To be Charged | Essentially, it is the generators' responsibility to transport the waste themselves. | Sid DS |

## 3 Numerical Targets of Action Plan

**Table 40 Numerical Targets of A/P**

| Waste categories | Parameters | Current | Target | Remark on the targets |
|---|---|---|---|---|
| 1,2,3. Paper, cardboard, plastic, cans | Amount recycled by generators | 14.4 | 14.4 | No changes were planned. The value of 2022 was adopted. |
| | Amount discharged to blue containers/bins for recycling | 0 | 85.6 | All other than those recycled at GSs |
| 9. Recyclable glass | Amount recycled by generators | 2.0 | 2.0 | No changes were planned. The value of 2022 was adopted. |
| | Amount discharged to yellow containers and recycled | 0 | 98.0 | All other than those recycled at GSs |
| 9. Glass other than recyclables | Amount treated by private companies | 0 | 100 | All non-recyclable glass |
| 4. Textile | Amount recycled by generators | 6.6 | 6.6 | No changes were planned. The value of 2022 was adopted. |
| 7. Kitchen waste | Residents who compost kitchen waste | 14.5 | 21 | The A/P aims to raise the proportion of residents engaged in home composting from |
| 10. Non-pruning GW | Residents who compost non-PW | 14.5 | 21 | |

| Waste categories | Parameters | Current | Target | Remark on the targets |
|---|---|---|---|---|
| | | | | the current 14.5% (POS result) to 21%. |
| 10. PW | Amount reused for mulch, fuel, compost, etc. | 0 | 100 | |
| 11. Bulky | Amount recycled by private companies | 0 | 50 | All recyclable portion of bulky waste (The recyclable portion of bulk waste was assumed to be 50%). |
| 12. WEEE | Amount treated by private companies | 0 | 100 | |
| 13. HMSW | Amount treated by private companies | 0 | 100 | |

## 4 Waste Flow

Based on the A/P, the planned Waste Flow was developed through the following steps.

1. The “Waste Management System according to Waste Type” was summarized as shown in Figure 28
2. The Waste Flow figure was designed as shown in Table 42.
3. The amounts of waste to be recycled, treated, and landfilled were estimated as shown in the note of Table 42 by applying the A/P’s targets.
4. Sid Commune's planned Waste Flow (with the implementation of the A/P) is developed by combining the results of Steps 2 and 3 above.
5. Based on the planned Waste Flow of Sid Commune, the Waste Flow of Sid Municipality in 2024 was developed.

**Table 41 Waste Management System According to 14 Waste Type**

| Waste Category | Small Waste Category | Discharge | Recycle /Treatment | Final Disposal | Data Sources |
|---|---|---|---|---|---|
| RW | 1,2,3. Paper, cardboard, plastic, cans | No (Recycling at GS) | No | No | POS |
| | | Blue Container or Bin | RMRF | No (Recycled) | Operation Record of RMRF |
| | | | | Residues at RLF | |
| | 7. Kitchen | No (Home Composting) | No | No | POS |
| | 9. Recyclable Glass | No (Recycling at GS) | No | No | POS |
| | | Yellow Container to RY | Private Company | No (Recycled) | Weighbridge data at RY |
| | 10. Non-pruning green waste | No (Home Composting) | No | No | POS |
| LW | 1.2.3 4.5.6.7.8. Non-recyclable paper, plastic, metal, textile, rubber, fine particles, kitchen and other waste. | Currently used Container or Bin | No | RLF | RLF data |
| | | | | Sid Landfill by Skip Loader for Private Container | Weighbridge data at RY |
| | 4. Textile | No (Recycling at GS) | No | No | POS |
| SW | 9. Non-recyclable glass | Container at RY | Private Company | No (Treated) | Weighbridge data at RY |

| Waste Category | Small Waste Category | Discharge | Recycle /Treatment | Final Disposal | Data Sources |
|---|---|---|---|---|---|
| | 10. Green Waste (GW) | Chipping Service for Recycling | Chipping | No (Recycled) | Chipping Machine Operation Data & Weighbridge data at RY |
| | | LW collection | No | RLF | RLF data |
| | 11. Bulky Waste | Collection or RY | RY | No (Recycled) | Weighbridge data at RY |
| | | | | Residues at RLF | Weighbridge data at RY |
| | 12. WEEE | Collection or RY | Private Company | No (Treated) | Weighbridge data at RY |
| | 13. HMW | RY | Private Company | No (Treated) | Weighbridge data at RY |
| | 14. C&D Waste | Collection or RY | No | Sid Landfill | Weighbridge data at RY |

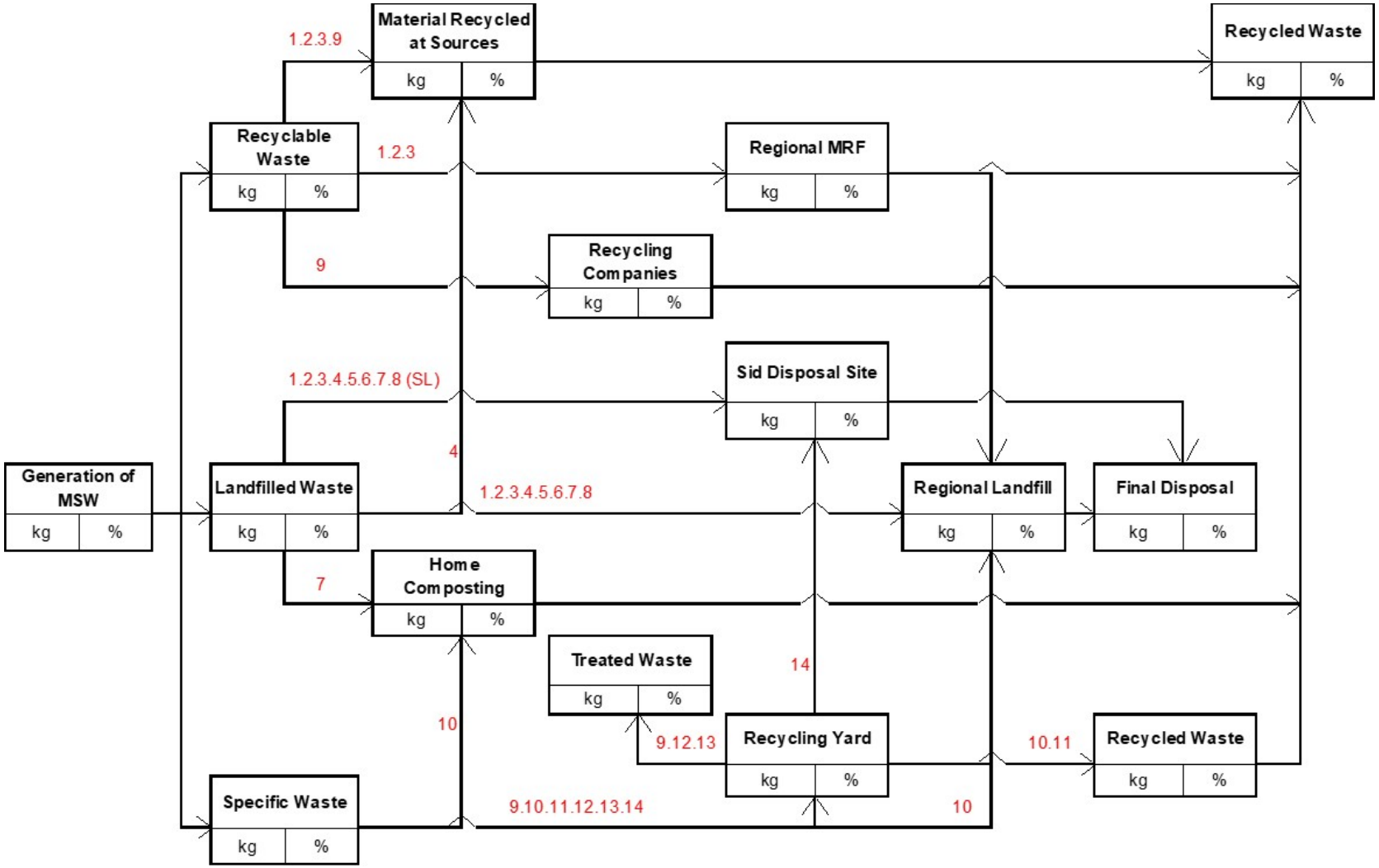



**Figure 28 Waste Flow according to 14 Waste Type**

**Table 42 Waste Amount Based on the Numerical Targets**

| Category | Sub-category | Recycling and Treatment | Generation (kg/day) | Recycling & Treatment Rate (%) | Recycling or Treatment (kg/day) | Final Disposal (kg/day) |
|---|---|---|---|---|---|---|
| RW | 1,2,3. Plastic, paper, cardboard, cans | Recycling at Generation Source (GS) | 3,901 | 14.4% | 562 | 0 |
| | | Recycling at RMRF | 3,406 | 70.0% | 2,338 | 1,002 |
| | 7. Kitchen waste | Home composting | 6,670 | 0.8% | 52[*1] | 6,619 |
| | 9. Recyclable glass | Recycling at GS | 1,478 | 2.0% | 29 | 0 |
| | | Recycling by Private Company | 1,449 | 100.0% | 1,449 | 0 |
| | 10. Non-pruning green waste | Home composting | 2,570[*3] | 18.1% | 464[*4] | 2,106 |
| LW | 1.2.3 Non-recyclable plastic, paper, metal | | 4,966 | 0.0% | 0 | 4,966 |
| | 5,6,8 Fine particles, rubber, kitchen waste | | 2,907 | 0.0% | 0 | 2,907 |
| | 4. Textile | | 566 | 6.6% | 37 | 529 |
| SW | 9. Non-Recyclable Glass | | 1,003 | 100.0% | 1,003[*2] | 0 |
| | 10. Pruning waste | Chipping | 2,570[*3] | 100.0% | 2,570 | 0 |
| | 11. Bulky | | 94 | 50.0% | 47 | 47 |
| | 12. WEEE | | 15 | 100.0% | 15 | 0 |

| Category | Sub-category | Recycling and Treatment | Generation (kg/day) | Recycling & Treatment Rate (%) | Recycling or Treatment (kg/day) | Final Disposal (kg/day) |
|---|---|---|---|---|---|---|
| | 13. HMW | | 36 | 100.0% | 36 | 0 |
| | 14. C&D Waste | | 339 | 0.0% | 0 | 339 |

Note:

*1: Assuming that 10% of the materials used for composting are kitchen waste, the current recycling amount is **36** kg/day. With the A/P target (to increase the share of residents who compost kitchen waste from 14.5% to 21%) applied, the amount used for composting is **52.1** kg/day (=>36 kg x 21% / 14.5%)

*2: All non-recyclable glass to be treated by private companies

*3: The ratio of Pruning Waste to Non-pruning Green Waste was assumed to be **1:1**.

*4: Assuming that 90% of the materials used for home composting are green waste, the current recycling amount is **320** kg/day. With the A/P target (to increase the share of residents who compost green waste from 14.5% to 21%) applied, the amount used for composting is **464** kg/day (=>320 kg x 21% / 14.5%)

- With the above numerical targets achieved, the solid waste management in 2024 will be as follows.

**Table 43 Recycling rate and Final disposal rate**

| | **Recycling rate** (Waste recycled divided by waste generated) | **Final disposal rate** (Waste finally disposed of divided by waste generated) |
|---|---|---|
| Sid Commune | 27.84% | 68.28% |
| Sid Municipality | 18.26% | 79.37% |

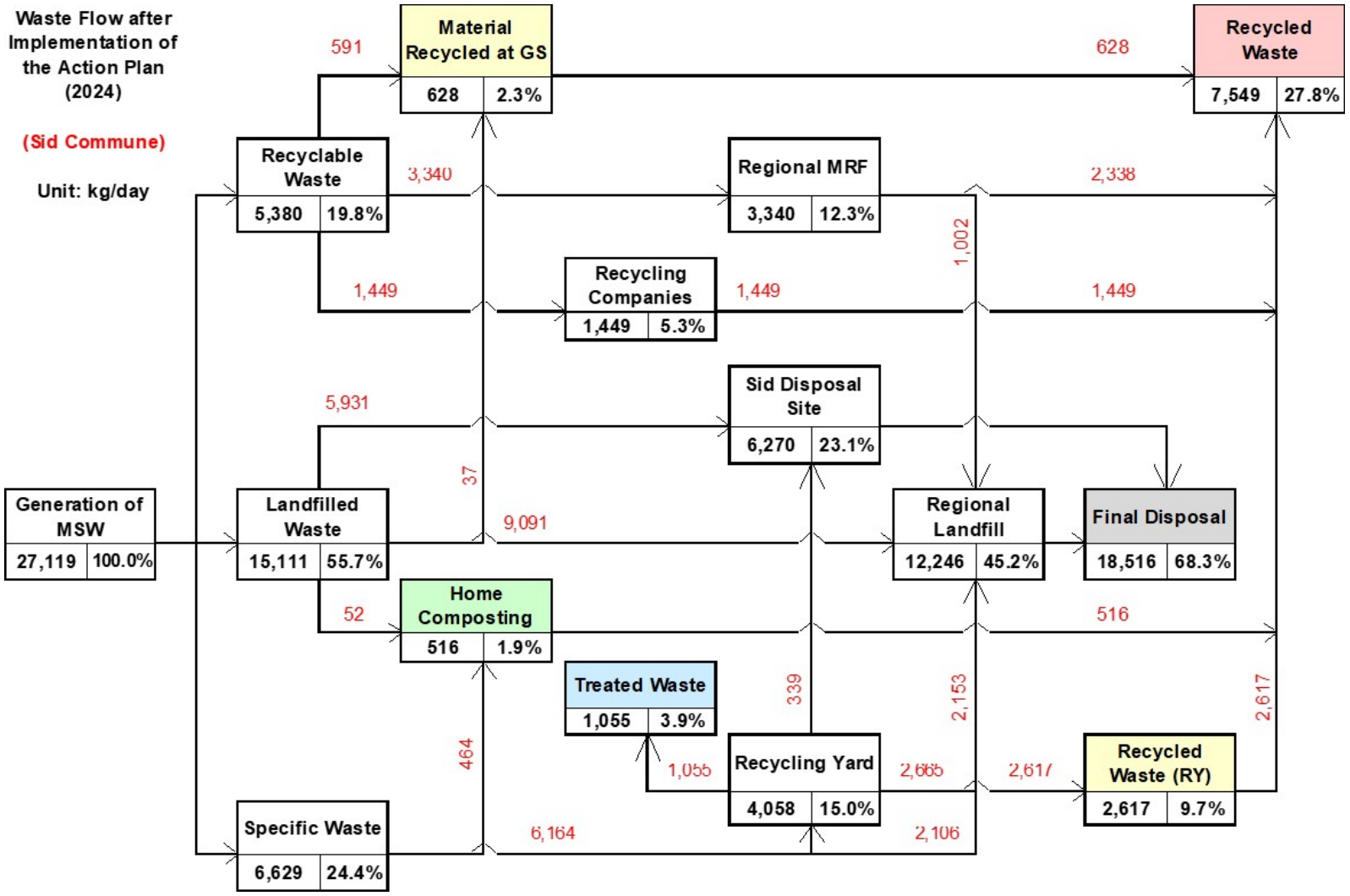



**Figure 29 Planned Waste Flow of Sid Commune in 2024**

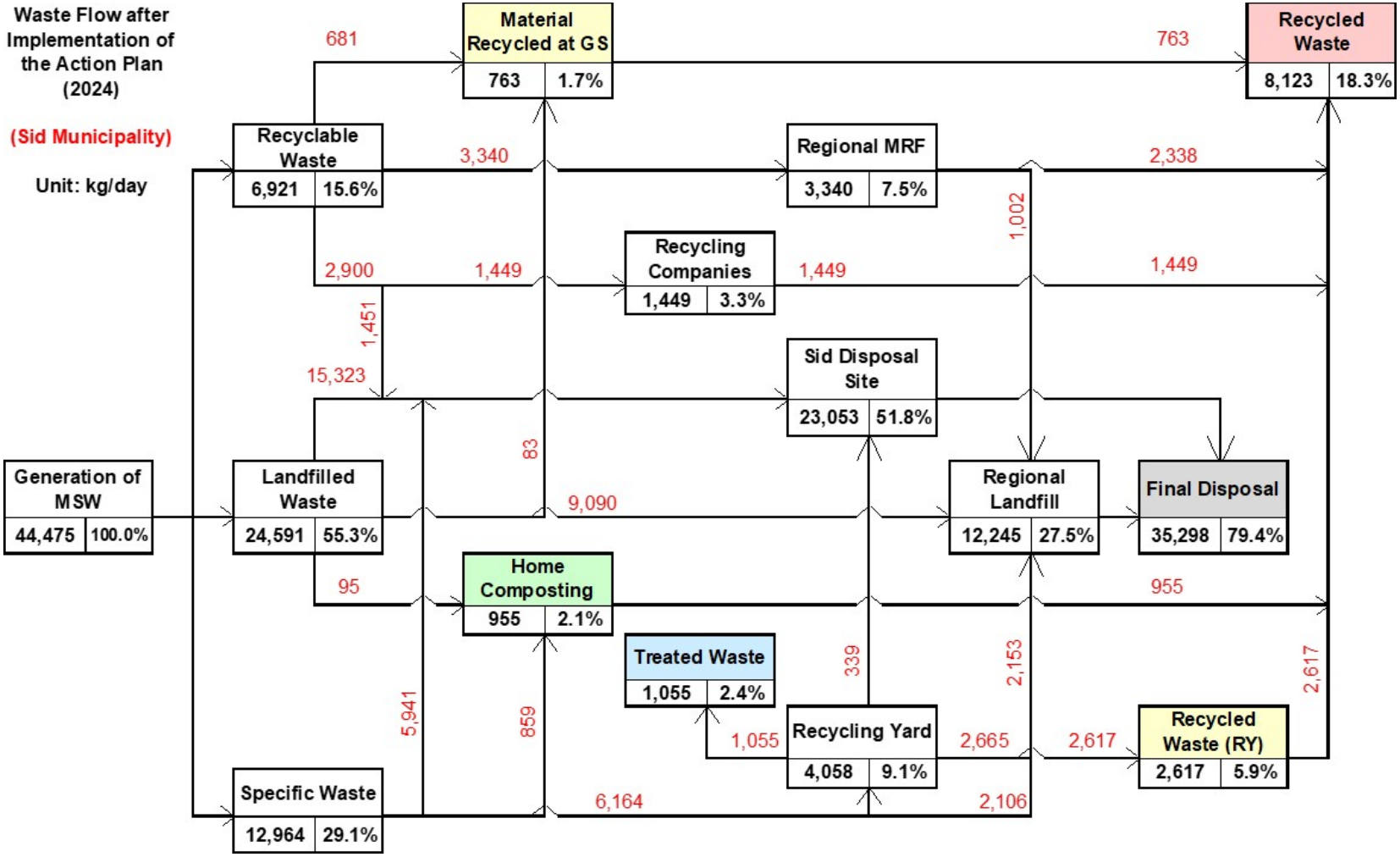



**Figure 30 Planned Waste Flow of Sid Municipality in 2024**

# STEP 5

# STEP 5 Implementation of Technical Plan

## 1 Purpose of Pilot Projects

- Implementation of AP, although targeting only a part of the entire municipality, requires a large inputs (finance, legal system, development of organizational structure, etc.). Thus, PPs are to implement a portion of the AP to verify its feasibility.
- Based on the results of the PPs' implementation, the contents of the AP will be revised.

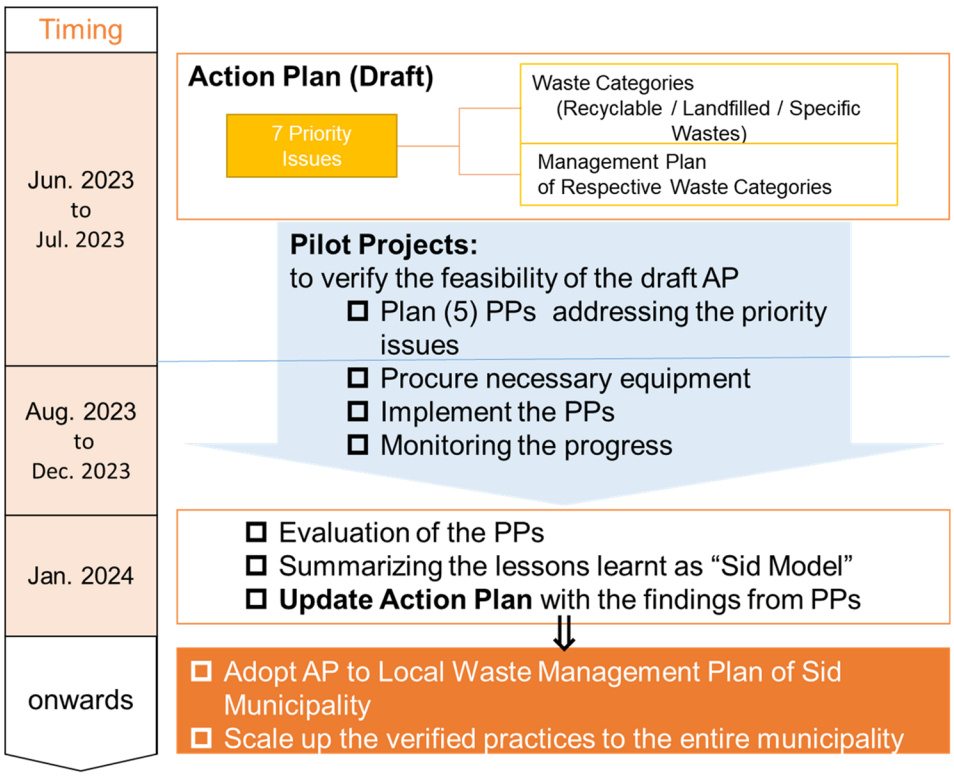



**Figure 31 Implementation Flow of PPs**

## 2 Selection of PPs

- PUC and JET held discussions and selected the following 5 PPs**:**

  **PP 1:** Proper separate discharge at the GSs;

  **PP 2:** Promotion of Home Composting;

  **PP 3:** Optimization of waste collection and transportation;

  **PP 4:** Proper Management of GW;

  **PP 5:** Optimal management of RY

# A PP1: Proper Separate Discharge at Generation Sources

## 1 Plan of Pilot Project

### 1.1 Background

- With the provision of the following by Instrument for Pre-Accession Assistance (IPA), separate collection started in Nov 2022:
    - Blue bins for recyclable waste for HHs in Sid Commune,
    - Blue containers for recyclable waste,
    - Yellow containers for recyclable glasses,
    - A CT for collecting and transporting recyclable waste to the RWMC,
    - Awareness campaign including provision of leaflets within Sid Commune.
- Why JICA Project need to do more?
    - There seemed to be ambiguity and/or confusion among the citizen about the use of the bins and containers.
    - The purity of the recyclable waste discharged in the blue bins and containers affects the cost of disposal borne by the PUC.

⇒ **More accurate separation by citizen is important.**

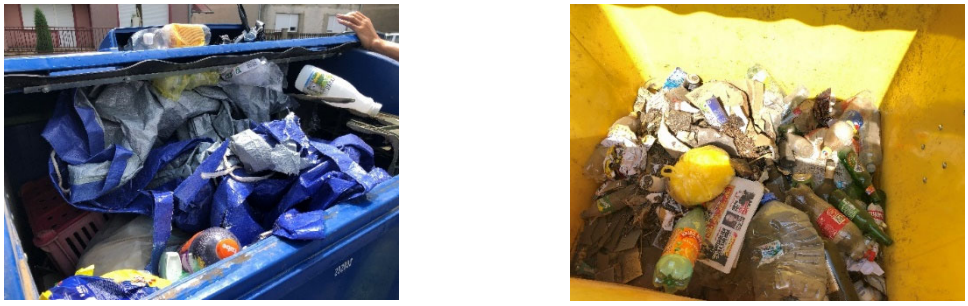


**Figure 32 Conditions of Blue and Yellow Containers before the PP**

In addition to the "Recyclable Waste",

- **The municipal waste that requires specific treatment** (bulky waste, WEEE, hazardous waste and construction & demolishing waste from HHs, non-recyclable glasses, etc.) **also need to be treated properly, not to be landfilled**.
    - The NWMP* also mandates each municipality to construct at least one Waste Management Center (RY) immediately.

- Furthermore, reducing the amount to be landfilled is one of the priorities in the NWMP[3] and the **reduction of GW** accounts for largely in this effort.
- For realization of the above, these types of waste also need **to be separated at the GS**.
- For the above reasons, the PUC decided to implement the PP1 (Proper Separate Discharge at GSs) in cooperation with JET.

## 1.2 Objectives of PP1

- Objectives:

  Separate discharge will be properly carried out by the residents in PP area
- Target Area:

  The South-western quarter of Sid Commune

## 1.3 Indicators

- % of HHs that put separation of the targeted waste in to practice (compared to the baseline by POS)
- Proportion of Recyclables mixed in LW (Waste Composition Survey)

## 1.4 Draft A/P for promoting separation

- Principles of the awareness activities are;
  - Communicating the Waste Types and respective discharge rules, **based on the "Technical Plan"** to the citizens.
  - No waste was to be left without its discharging rules explained, nor without destinations.
- Following activities are implemented:
  0. Baseline Survey (WCS, POS)
  1. Utilization of IPA project's awareness materials such as leaflets, animation clips, pictures.
  2. Improvement of the way that Yellow Containers are used.
  3. Development and distribution of leaflet that covers all waste types.
  4. School program focusing on the waste separation
  5. Activities related to PP3, PP4, and PP5.
  6. Development of Short video clip for awareness raising
  7. Installation of New Bins and Containers

[3] NWMP: Waste Management Program of the Republic of Serbia for the Period 2022-2031

### 1.5 Planned Inputs

- JET
  - Printing cost of leaflets and signboards (if necessary)
  - Monitoring of the Progress
  - POS (Baseline and End-line)
- PUC
  - Distribution of blue bins & containers, yellow containers
  - Collection service as planned
  - Waste composition survey (WCS) (in early Sep. 2023 & Jan 2024)

## 2 Implementation of PP1

### 2.1 Baseline Survey in PP area

#### 1) Waste Composition Survey

- Purpose:

  To see how much of inadequate types of waste are discharged in Blue Bin (RW) and in Green Bin (LW).
- Target area of the survey:

  The South-western quarter of Sid Commune
- Timing of Survey:

  September 6, 2023
- Method:
  1. Blue Bin waste (RW) that was accumulated over the past 1 month was discharged to the PUC's regular collection.
  2. Green Bin waste (LW) from HHs from the target area only was collected by a separate vehicle.
  3. Waste Composition Survey was conducted respectively for RW and LW, using the 14 categories shown in Table 41. Especially, Paper & cardboard, plastic, metal, and glass were sorted to "Recyclable" and "Non-recyclable." (See next slide for the Waste Types used for WCA.)
  4. Each separated type of waste was weighed.

**Table 44 Waste Types for Sorting in WACS**

| No | Types | Groups | |
|---|---|---|---|
| | | Recyclable waste | Non-recyclable waste |
| 1 | Paper and cardboard | Cardboard boxes, Paper wrappers & labels, Paper bags, Multilayer cardboard packaging for beverage, White paper & notebooks, Newspaper | All other paper wastes than the recyclables |
| 2 | Plastic | Plastic bottles for water and juices, Plastic containers, PET packages, Plastic caps and lids | All other plastic wastes than the recyclables |
| 3 | Metal | Drink cans, Food cans, Metal caps & lids | All other metal wastes than the recyclables |
| 4 | Textile | Should not be in green bins | All textile |
| 5 | Rubber | | All rubber |
| 6 | Fine particles | | All fine particles |
| 7 | Kitchen waste | | All kitchen waste |
| 8 | Other waste | | All waste that cannot be classified into the above types. |
| 9 | Glass | Should not be in blue bins<br>Glass bottles and jars | Other glasses than the recyclables |
| 10 | Green Waste | | Should not be in either of the bins |
| 11 | Bulky waste | | |
| 12 | WEEE | | |
| 13 | Hazardous municipal waste | | All hazardous municipal waste |
| 14 | Construction & demolition waste | | All construction and demolition waste |

- Results:

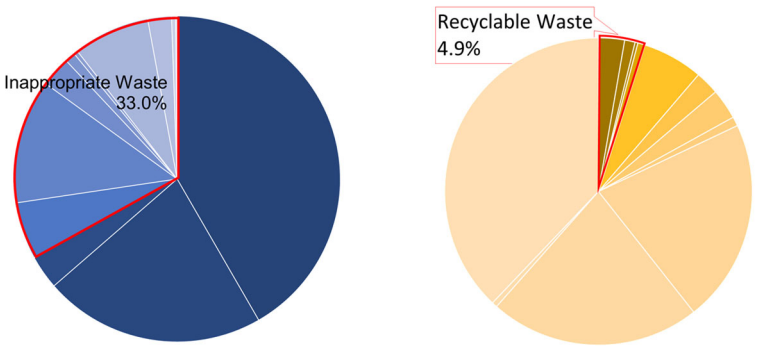



**Figure 33 Compostion of Waste in Blue Bin (RW) and Green Bin (LW)**

## 2) POS

- Purpose:

  To understand the current practice of the citizen in the target area especially about their behaviors related to 3Rs.

- Method:
  - Door-to-Door interviews based on a questionnaire, visiting houses randomly (every other houses).
  - Interviewers had the Google Form questionnaire on their smartphone.
  - 400 HHs to have a statistically valid result.
- Timing of Survey:
  - September 23 – 25, 2022
- Target Area:
  - The south-western quarter of Sid Commune
- Results:

**Table 45 Answers to "What do you do with PET bottle/ Aluminum Cans/Glass Bottles/ Carton Box waste?"**

| | PET Bottles | Aluminum Cans | Glass Bottles | Carton Box |
|---|---|---|---|---|
| Separate | 7% | 6% | 50% | 24% |
| Not separate | 92% | 93% | 50% | 75% |
| Other | 1% | 0% | 0% | 0% |

**Table 46 Answers to "Please choose any of the following that applies to you."**

| Answer | % |
|---|---|
| I often bring my bags (or used plastic bags) when I go shopping. | 72% |
| I try to choose refillable products. | 8% |
| I often bring my mugs and/or bottles for drinks. | 14% |
| I make compost from waste from kitchen and/or garden. | 14% |
| None of these does not apply to me. | 22% |

**Table 47 Answers to "What do you usually do with furniture waste?"**

| Answer | % |
|---|---|
| I call PUC Standard for collection. | 39% |
| I leave it beside the waste bin/container on a collection day. | 7% |
| I break it into pieces and put them into the waste bin. | 4% |
| I give it to somebody for reuse either with or without payment. | 47% |
| I use it for heating. | 1% |
| Other | 1% |

**Table 48 Answers to "What do you usually do with home appliance waste in a large size (such as TV, fridge, washing machine, etc.) ?"**

| Answer | % |
|---|---|
| I call PUC Standard for collection. | 39% |
| I leave it beside the waste bin/container on a collection day. | 11% |
| I break it into pieces and put them into the waste bin. | 2% |
| I give it to somebody for reuse either with or without payment. | 45% |
| I give it to the shop at the exchange of a new one. | 2% |
| Other | 0% |

## 2.2 Implementation of Activities

### 1) Activity 1: Utilization of IPA awareness materials

- TV advertisement regarding the rules of Blue Bin/Containers and Yellow Containers were repeatedly aired (every 2 weeks) , using the animation clips
- On SNS (Facebook, Instagram) of PUC, messages about the rules of Blue & Yellow Containers were posted
- Monthly reminder of Blue Bin collection is posted on SNS


**Figure 34 Messages Posted on SNS**

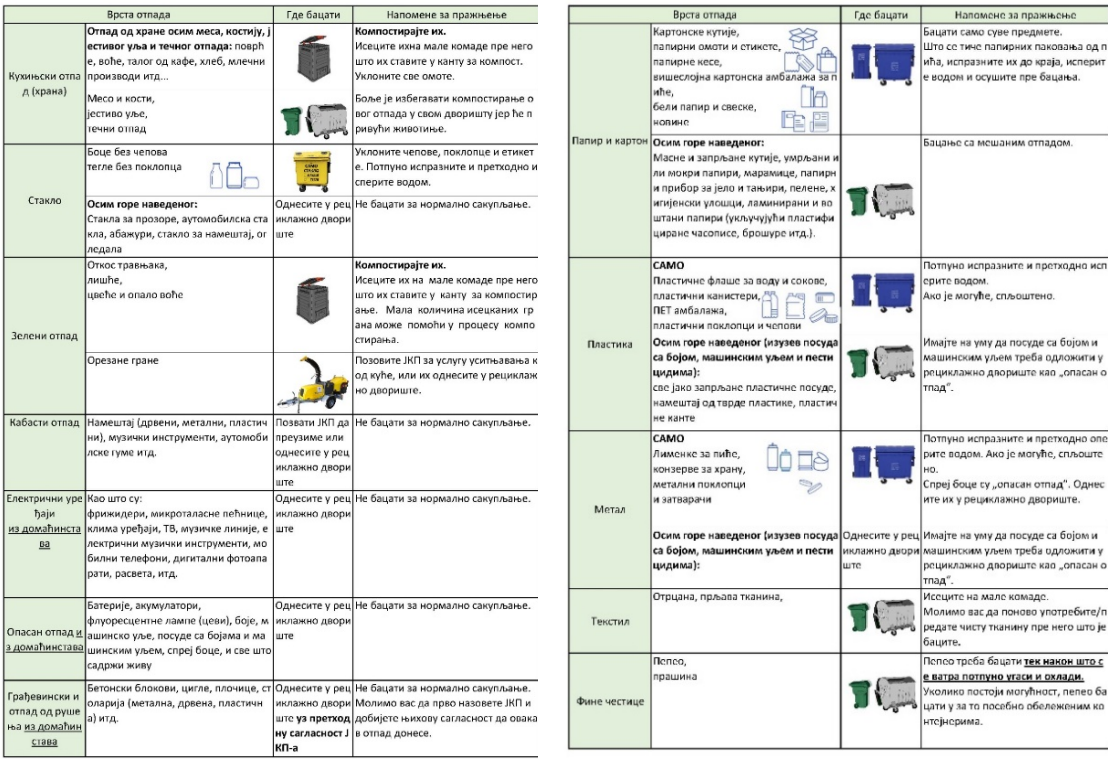
## 2) Activity 2: Improvement of the Way That Yellow Containers Are Used

- Yellow Containers seemed to be misused more than Blue Containers. Larger-font Stickers for Yellow Containers were created to make them more visible.
- SNS messages and TV advertisement on Yellow Container use were also used.


**Figure 35 Stickers placed on Yellow Container**

## 3) Activity 3: Development of Leaflet & Poster on Separation Rules

- Leaflet and Posters on Discharge Rules covering all 14 Waste Types was developed, **based on the Technical Plan** developed for the A/P. This means what is described in the leaflet is what has been confirmed to be implemented, not a "wish list."
- Leaflets were **hand-delivered** to residents by PUC's fee collectors who would visit houses door-to-door. (1st week of December 2023 along with the November bill.)
- Posters (each page on A3-size) were posted at the entrance of apartment buildings. (2nd week of December 2024)



| Врста отпада | | Где бацати | Напомене за пражњење |
|---|---|---|---|
| Кухињски отпад (храна) | **Отпад од хране осим меса, костиј, јестивог уља и течног отпада:** поврће, воће, талог од кафе, хлеб, млечни производи итд...<br>Месо и кости, јестиво уље, течни отпад | | **Компостирајте их.** Исеците ихна мале комаде пре него што их ставите у канту за компост. Уклоните све омоте.<br>Боље је избегавати компостирање о вог отпада у свом дворишту јер ће п ривући животиње. |
| Стакло | Боце без чепова<br>тегле без поклопца | | Уклоните чепове, поклопце и етикет е. Потпуно исперите и претходно и сперите водом. |
| | **Осим горе наведеног:**<br>Стакла за прозоре, аутомобилска ста кла, абажури, стакло за намештај, ог ледала | Однесите у рец иклажно двориште | Не бацати за нормално сакупљање. |
| Зелени отпад | Откос травњака, лишће, цвеће и опало воће | | **Компостирајте их.** Исеците их на мале комаде пре него што их ставите у канту за компостир ање. Мала количина исецканих гр ана може помоћи у процесу компо стирања. |
| | Орезане гране | | Позовите ЈКП за услугу уситњавања к од куће, или их однесите у рециклаж но двориште. |
| Кабасти отпад | Намештај (дрвени, метални, пластич ни), музички инструменти, аутомоби лске гуме итд. | Позвати ЈКП да преузме или однесите у рец иклажно двориште | Не бацати за нормално сакупљање. |
| Електрични уређаји из домаћинстава | Као што су: фрижидери, микроталасне пећнице, клима уређаји, ТВ, музичке линије, е лектрични музички инструменти, мо билни телефони, дигитални фотоапа рати, расвета, итд. | Однесите у рец иклажно двориште | Не бацати за нормално сакупљање. |
| Опасан отпад из домаћинстава | Батерије, акумулатори, флуоресцентне лампе (цеви), боје, м ашинско уље, посуде са бојама и ма шинским уљем, спреј боце, и све што садржи живу | Однесите у рец иклажно двори ште | Не бацати за нормално сакупљање. |
| Грађевински и отпад од рушења из домаћинстава | Бетонски блокови, цигле, плочице, ст оларија (метална, дрвена, пластич на) итд. | Однесите у рец иклажно двори ште **уз претход ну сагласност ЈКП-а** | Не бацати за нормално сакупљање. Молимо вас да прво назовете ЈКП и добијете њихову сагласност да овака в отпад донесе. |

| Врста отпада | | Где бацати | Напомене за пражњење |
|---|---|---|---|
| Папир и картон | Картонске кутије, папирни омоти и стикете, папирне кесе, вишеслојна картонска амбалажа за п ића, бели папир и свеске, новине | | Бацати само суве предмете. Што се тиче папирних паковања од п ића, испразните их до краја, исперит е водом и осушите пре бацања. |
| | **Осим горе наведеног:**<br>Масне и запрљане кутије, умрљани и ли мокри папири, марамице, папирн и прибор за јело и тањири, пелене, х игијенски улошци, ламинирани и во штани папири (укључујући пластифи циране часописе, брошуре итд.). | | Бацање са мешаним отпадом. |
| Пластика | **САМО**<br>Пластичне флаше за воду и сокове, пластични канистери, ПЕТ амбалажа, пластични поклопци и чепови | | Потпуно испразните и претходно исп рите водом.<br>Ако је могуће, спљоштено. |
| | **Осим горе наведеног (изузев посуда са бојом, машинским уљем и пести цидима):**<br>све јако запрљане пластичне посуде, намештај од тврде пластике, пластич не канте | | Имајте на уму да посуде са бојом и машинским уљем треба одложити у рециклажно двориште као „опасан о тпад". |
| Метал | **САМО**<br>Лименке за пиће, конзерве за храну, метални поклопци и затварачи | | Потпуно испразните и претходно опе рите водом. Ако је могуће, спљоште но.<br>Спреј боце су „опасан отпад". Однес ите их у рециклажно двориште. |
| | **Осим горе наведеног (изузев посуда са бојом, машинским уљем и пести цидима):** | Однесите у рец иклажно двори ште | Имајте на уму да посуде са бојом и машинским уљем треба одложити у рециклажно двориште као „опасан о тпад". |
| Текстил | Отрцана, прљава тканина, | | Исеците на мале комаде.<br>Молимо вас да поново употребите/п редате чисту тканину пре него што је баците. |
| Фине честице | Пепео, прашина | | Пепео треба бацати **тек након што с е ватра потпуно угаси и охлади.**<br>Уколико постоји могућност, пепео ба цати у за то посебно обележеним ко нтејнерима. |

**Figure 36 Distributed Leaflets**

### 4) Activity 4: School Awareness Program

- **3-day program** was conducted for a 4th-grade class:

1. Pre-tour workshop (Game-based activity)
    a. What waste do we create in our daily life?
    b. Why do we "separate the waste?"
    c. Overview of Rules on Waste Separation in Sid (Explanation of the leaflet)
2. Tour to RWMC (Planned with the Srem-Macva PUC)
    a. How are the waste brought in and where do they go?
    b. How are they treated? (It was arranged so that the separation Line could be observed from the Control Room's screen.)
3. Debriefing workshop
    a. What are the findings from the Study Tour?
    b. What can we do to make more eco-friendly community? Let's set the goals for the school: what/how/by when

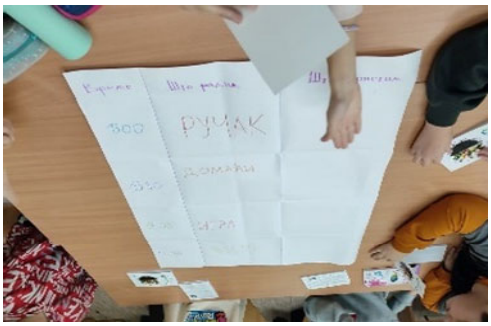



**Figure 37 Activities in Pre-tour Workshop**

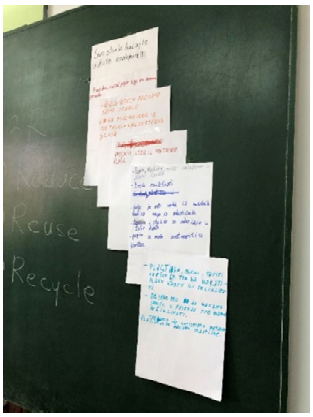



**Figure 38 Tour to RWMC and the Output of Debriefing Workshop**

### 5) Activity 5: Activities in relation to other PPs

- Upon replacing 5m$^3$ containers with 1.1m$^3$ containers, in order to create awareness on the use of RI and separation of waste;

- the PUC painted walls of 5 RIs located within two apartment complexes, and
- organized a children's wall paining event

**Figure 39 Wall Painting Event**

**Figure 40 Containers Introduced**

- PP4 (Proper management of pruning waste) was promoted through the compost manual distributed in PP, which included an announcement of up-coming mobile chipping services for pruning waste generated at households (See Figure 40).

- PP5 (Optimal management of Recycling Yard) was promoted through the general leaflet, explaining the types of waste that are to be accepted in Recycling Yard (See Figure 41).


**Figure 41 Annoucement of Mobile Chipping Service inserted in the Compost Manual**


| | | | |
|---|---|---|---|
| Метал | **САМО** Лименке за пиће, конзерве за храну, метални поклопци и затварачи<br>**Осим горе наведеног (изузев посуда са бојом, машинским уљем и пести цидима):** | Однесите у рециклажно дворишт е | Потпуно испразните и претходно опе рите водом. Ако је могуће, спљоште но.<br>Спреј боце су „опасан отпад". Однес ите их у рециклажно двориште.<br>Имајте на уму да посуде са бојом и машинским уљем треба одложити у рециклажно дворište као „опасан о тпад". |
| Стакло | Боце без чепова тегле без поклопца<br>**Осим горе наведеног:** Стакла за прозоре, аутомобилска ста кла, абажури, стакло за намештај, ог ледала | Однесите у рециклажно дворište | Уклоните чепове, поклопце и етикет е. Потпуно испразните и претходно и сперите водом.<br>Не бацати за нормално сакупљање. |
| Зелени отпад | Отказ травњака, лишће, цвеће и опало воће<br>Орезане гране | | **Компостирајте их.** Исеците их на мале комаде пре него што их ставите у канту за компостир ање. Мала количина исецканих гр ана може помоћи у процесу компо стирања.<br>Позовите ЈКП за услугу уситњавања к од куће, или их однесите у рециклаж но двориште. |
| Кабасти отпад | Намештај (дрвени, метални, пластич ни), музички инструменти, аутомоби лске гуме итд. | Позвати ЈКП да п реузмне или од несите у | Не бацати за нормално сакупљање. |
| Електрични уре ђаји из домаћинста ва | Као што су: фрижидери, микроталасне пећнице, клима уређаји, ТВ, музичке линије, е лектрични музички инструменти, мо билни телефони, дигитални фотоапа рати, расвета, итд. | Однесите у рециклажно двори ште | Не бацати за нормално сакупљање. |
| Опасан отпад и з домаћинстава | Батерије, акумулатори, флуоресцентне лампе (цеви), боје, м ашинско уље, посуде са бојама и ма шинским уљем, спреј боце, и све што садржи живу | Однесите у рециклажно двори ште | Не бацати за нормално сакупљање. |
| Грађевински и отпад од руше ња из домаћин ства | Бетонски блокови, цигле, плочице, ст оларија (метална, дрвена, пластичн а) итд. | **Уз претходну с агласност ЈКП-а** | Не бацати за нормално сакупљање. Молимо вас да прво назовете ЈКП и добијете њихову сагласност да овака в отпад донесе. |

**Figure 42 The section in the general leaflet and PUC's SNS post explaning the waste targeted in Recycling Yard and**

## 6) Activity 6: Development of Short Video Clip for Awareness Raising

- 3 kinds of short video clips are prepared for promotion of:
  - Blue container use

- Mobile chipping service of PW/GW
- the use of RY

- All scenarios are:
  - situated in Sid,
  - based on the actual implementation plan and focusing on the actual problem
- The local theater group cooperated in acting and editing.

**Figure 43 Making Short Video Clips**

### 7) Activity 7: Installation of New Bins and Containers

While expecting the citizens to follow the separation rules, PUC also introduced new containers for inducing better separation:

- Bin for Glass Bottles for Cafes and Restaurants:
- Initially yellow containers were used for the purpose.
- However, yellow containers can be far away from the shops.
- (Unfortunately) non-recyclables can also be mixed in, and the content's quality of the containers would not be fit for recycling.

⇓

- Bins and containers were distributed individually to cafes and restaurants to
  - secure a good quality of recyclable glass collection.


**Figure 44 Container for Glass bottles**

- This way, PUC now secures the well-separated recyclable glass bottles.

☐ Container for Ash only:

Ash sometimes thrown in before cooling down, or even still smoking, which damages containers. PUC placed Ash-only containers for 2 locations. In one of the location, the condition has improved and no burning waste has been reported so far.


**Figure 45 Container for ash and its contents**

# 3 Evaluation of PP1

## 3.1 End-line Survey

### 1) Result of Waste Composition Survey

#### a. Blue Bin (RW) Collection

Non-recyclable paper, plastic & metal, and recyclable glass bottles that should be discharged in Yellow containers are still included in Blue Bin.

However, significant improvement is observed in the waste quality of “Blue Bin” waste, with much less inappropriate waste included.

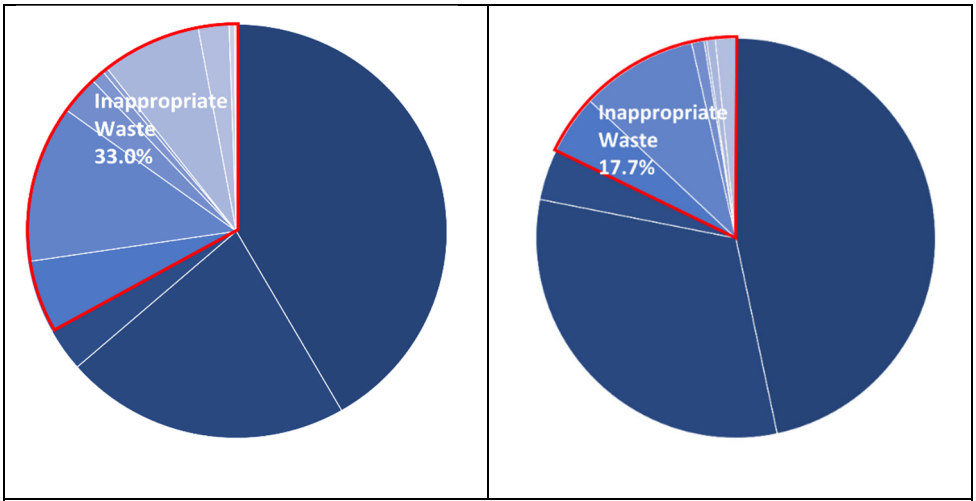



**Figure 46 Comparison of Waste Composition in Blue Bin (RW) between Baseline Survey (Sep. 05, 2023, left) and End-line (Jan. 10, 2024, right)**

**Table 49 Results of Baseline and End-line Surveys**

| Blue Bin Waste (RW) | | Sep. 6, 2023 WCS | | Jan. 10, 2024 WCS | |
|---|---|---|---|---|---|
| | | Composition (%) | | Composition (%) | |
| No | Types of waste | Appropriate | Inappropriate | Appropriate | Inappropriate |
| 1 | Paper and cardboard | 41.7% | 5.7% | 46.7% | 4.7% |
| 2 | Plastic | 21.9% | 12.4% | 31.4% | 9.4% |
| 3 | Metal | 3.4% | 3.0% | 4.2% | 1.0% |
| 4 | Textile | 0.0% | 1.0% | 0.0% | 0.0% |
| 5 | Rubber | 0.0% | 0.4% | 0.0% | 0.2% |
| 6 | Fine particles | 0.0% | 0.0% | 0.0% | 0.0% |
| 7 | Kitchen waste | 0.0% | 0.0% | 0.0% | 0.0% |
| 8 | Other waste | 0.0% | 7.6% | 0.0% | 0.7% |
| 9 | Glass | 0.0% | 2.4% | 0.0% | 1.6% |
| 10 | Green Waste | 0.0% | 0.0% | 0.0% | 0.0% |
| 11 | Bulky waste | 0.0% | 0.0% | 0.0% | 0.0% |
| 12 | WEEE | 0.0% | 0.4% | 0.0% | 0.0% |
| 13 | Municipal hazardous waste | 0.0% | 0.1% | 0.0% | 0.0% |
| 14 | Construction & demolition waste | 0.0% | 0.0% | 0.0% | 0.0% |
| | Total | 67.0% | 33.0% | 82.3% | 17.7% |

### b. Green Bin (LW) Collection

This appears to indicate no substantial improvement. However, the result in September was influenced by the significant portion of GW (37.9%), in contract to only 4.2% in January.

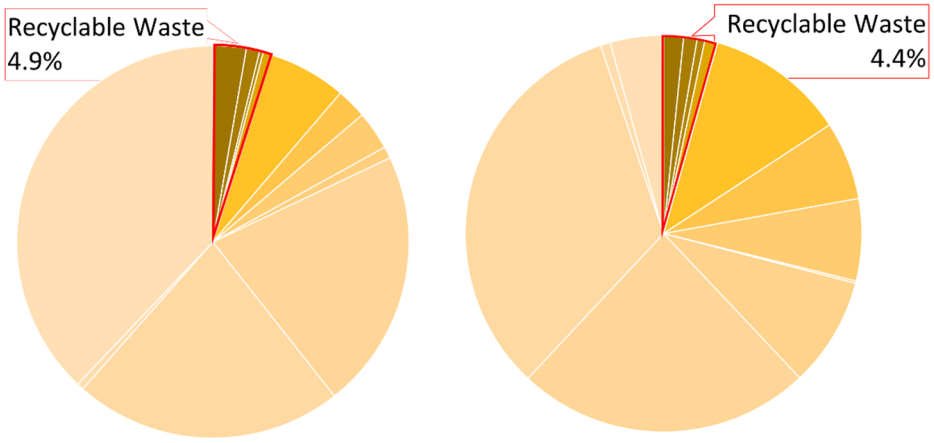



**Figure 47 Comparison of Waste Composition in Green Bin (LW) between Baseline (Sep. 05, 2023; left) and End-line (Jan. 10, 2024; right)**

**Table 50 Comparison of Waste Composition in Green Bin (LW) between Baseline and End-line Surveys**

| Green Bin Waste (LW) | | Sep. 6, 2023 WCS | | Jan. 10, 2024 WCS | |
|---|---|---|---|---|---|
| | | Composition (%) | | Composition (%) | |
| No | Types of waste | Recyclable | Non-recyclable | Recyclable | Non-recyclable |
| 1 | Paper and cardboard | 2.7% | 6.4% | 1.6% | 11.4% |
| 2 | Plastic | 1.1% | 2.5% | 1.1% | 6.4% |
| 3 | Metal | 0.3% | 0.0% | 0.6% | 0.0% |
| 4 | Textile | 0.0% | 3.2% | 0.0% | 6.7% |
| 5 | Rubber | 0.0% | 1.0% | 0.0% | 0.2% |
| 6 | Fine particles | 0.0% | 0.0% | 0.0% | 8.9% |
| 7 | Kitchen waste | 0.0% | 21.4% | 0.0% | 24.0% |
| 8 | Other waste | 0.0% | 22.2% | 0.0% | 32.9% |
| 9 | Glass | 0.8% | 0.6% | 1.0% | 0.8% |
| 10 | Green Waste | 0.0% | 37.9% | 0.0% | 4.2% |
| 11 | Bulky waste | 0.0% | 0.0% | 0.0% | 0.0% |
| 12 | WEEE | 0.0% | 0.0% | 0.0% | 0.0% |
| 13 | Municipal hazardous waste | 0.0% | 0.0% | 0.0% | 0.1% |
| 14 | Construction & demolition waste | 0.0% | 0.0% | 0.0% | 0.1% |
| | Total | 4.9% | 95.1% | 4.4% | 95.6% |

### c. Green Bin (LW) Collection: Result Excluding "GW" from the Composition

Although there is still a small portion of recyclable waste included, a steady improvement is observed. People seem to be more proactive about "putting recyclable to a Blue Bin"

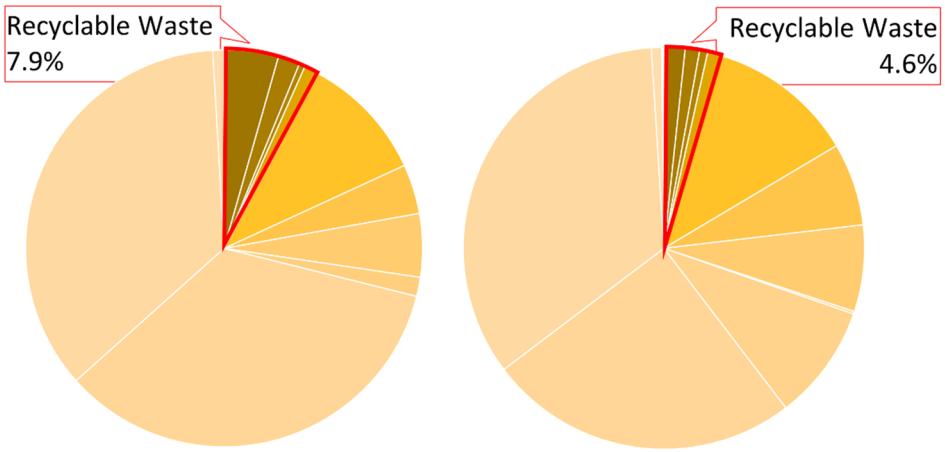



**Figure 48 Comparison of Waste Composition in Green Bin (LW without Green Waste) between Baseline (Sep. 05, 2023; left) and End-line (Jan. 10, 2024; right) Excluding "GW"**

**Table 51 Comparison of Waste Composition in Green Bin (LW) between of Baseline and End-line Surveys Excluding "GW"**

| Green Bin Waste (LW) Excluding Green Waste | | Sep. 6, 2023 WCS | | Jan. 10, 2024 WCS | |
|---|---|---|---|---|---|
| | | Composition (%) | | Composition (%) | |
| No | Types of waste | Recyclable | Non-recyclable | Recyclable | Non-recyclable |
| 1 | Paper and cardboard | 4.4% | 10.3% | 1.7% | 11.9% |
| 2 | Plastic | 1.8% | 4.0% | 1.2% | 6.7% |
| 3 | Metal | 0.5% | 0.0% | 0.7% | 0.0% |
| 4 | Textile | 0.0% | 5.2% | 0.0% | 7.0% |
| 5 | Rubber | 0.0% | 1.6% | 0.0% | 0.2% |
| 6 | Fine particles | 0.0% | 0.0% | 0.0% | 9.3% |
| 7 | Kitchen waste | 0.0% | 34.5% | 0.0% | 25.1% |
| 8 | Other waste | 0.0% | 35.7% | 0.0% | 34.3% |
| 9 | Glass | 1.2% | 0.9% | 1.1% | 0.8% |
| 10 | Green Waste | 0.0% | 0.0% | 0.0% | 0.0% |
| 11 | Bulky waste | 0.0% | 0.0% | 0.0% | 0.0% |
| 12 | WEEE | 0.0% | 0.0% | 0.0% | 0.0% |
| 13 | Municipal hazardous waste | 0.0% | 0.0% | 0.0% | 0.1% |
| 14 | Construction & demolition waste | 0.0% | 0.0% | 0.0% | 0.1% |
| | Total | 7.9% | 92.1% | 4.6% | 95.4% |

### 2) Result of POS

- Separation of the Recyclable Waste targeted in IPA manual is increasingly recognized.
- Separating Glass Bottle into Yellow Container seems to need more promotion.

**Table 52 Answers to "What do you do with PET bottle/Aluminum Cans/Glass Bottles/ Carton Box waste?"**

| | PET Bottles | | Aluminum Cans | | Glass Bottles | | Carton Box | |
|---|---|---|---|---|---|---|---|---|
| | Base | End | Base | End | Base | End | Base | End |
| Separate | 7% | 99% | 6% | 91% | 50% | 75% | 24% | 97% |
| Not separate | 92% | 1% | 93% | 2% | 50% | 20% | 75% | 2% |
| Other | 1% | 0% | 0% | 0% | 0% | 5% | 0% | 0% |
| the blue bin/ container | | 97% | | 91% | | 21% | | 68% |

A little increase in separation of the following was observed.

- furniture waste **(87% ⇒91%)** and
- WEEE (86% ⇒ 88%)

**Table 53 Answers to "What do you usually do with furniture waste?"**

| Answer | Base | End |
|---|---|---|
| I call PUC Standard for collection. | 39% | 46% |
| I leave it beside the waste bin/container on a collection day. | 7% | 5% |
| I break it into pieces and put them into the waste bin. | 4% | 2% |
| I give it to somebody for reuse either with or without payment. | 47% | 34% |
| I use it for heating. | 1% | 6% |
| I bring it to the RY of PUC. | | 5% |
| Other | 1% | 1% |

**Table 54 Answers to "What do you usually do with home appliance waste in a large size (such as TV, fridge, washing machine, etc.) ?"**

| Answer | Base | End |
|---|---|---|
| I call PUC Standard for collection. | 39% | 42% |
| I leave it beside the waste bin/container on a collection day. | 11% | 9% |
| I break it into pieces and put them into the waste bin. | 2% | 1% |
| I give it to somebody for reuse either with or without payment. | 45% | 32% |
| I give it to the shop at the exchange of a new one. | 2% | 6% |
| I bring it to the RY of PUC. | | 9% |
| Other | 0% | 1% |

**Table 55 Answers to "Please choose any of the following that applies to you."**

| Answer | Base | End |
|---|---|---|
| I often bring my bags (or used plastic bags) when I go shopping. | 72% | 81% |
| I try to choose refillable products. | 8% | 3% |
| I often bring my mugs and/or bottles for drinks. | 14% | 6% |
| I make compost from waste from kitchen and/or garden. | 14% | 8% |
| None of these does not apply to me. | 22% | 16% |

In the Baseline survey, very high rate of "reduce" behaviors were already observed. Therefore, no particular actions were taken in this PP to highlight such behaviors.
However, with no reinforcing messages, these actions seems to be still easily disappearing. Constant reinforcement is necessary.

### 3) Monitoring of Recycling Islands

JET observed 10 locations with Blue & Yellow containers. There are a few locations with relatively good status of separation, but still more separation is necessary, especially Yellow Containers.
Figure 46 shows some example of monitoring records of Recycling Islands in Sid Commune conducted by JET over 6 months.


**Figure 49 Monitoring of RI over 6 months**

### 3.2 Actual Inputs

- ☐ JET
- Printing cost of leaflets: 1500 sheets (A3 size, full-color): **72,000 RSD**
- Printing cost of posters: 120 sets (A3 size x 3 sheets, full-color): **45,360 RSD**
- Yellow Container Stickers: 70 sets x 2 sizes: **50,400 RSD**
- Video clip creation : for video shooting (utilizing local talents): **60,000 RSD**
- School program
  - materials, bus, admission fee for nature park, snacks: **76,000 RSD**
  - 3 persons x 3 days (2 hrs + 1 day + 2 hrs)
- POS (Baseline and End-line) : 10 person x 3 days x 2 times
- Monitoring of the Progress : (1 person+ vehicle) x 3 times

- ☐ PUC
- Wall paintings at 6 RIs (including the Children's painting event)
  - 10 persons x 4 days
  - Painting materials **50,000 RSD**
- Establishing new RI at Sot Lake **:** 3 persons x 1+ local NGO
- Distribution of the leaflet: 5 persons (fee collectors) x 1 days
- Placing the posters : 3 persons x 2 days
- WCS (in early Sep. & Jan) :
  - (1 driver + 1 truck) x 2 times
  - 30 persons x 1 day x 2 times

## 4 Review of the A/P

### 4.1 Matters to be considered for implementing A/P in Sid Commune

- ☐ The core of the public awareness, "Communicating the Waste Types and respective discharge method," should remain.
- ☐ The following points need to be included:
  - Reduction and Reuse need to be encouraged constantly, beside separation.
  - Video clips to promote separation will be aired on TV for the use of RY and Chipping Machine.
- ☐ The way of improving the container user's behavior, including visibility of the waste thrown in, need to be considered.

**Figure 50 A scene from Video-Shooting on Container Use**

## 4.2 Implementation plan of A/P in Sid commune

Table 53 shows the implementation schedule of activities conducted under PP1.

**Table 56 Implementation Schedule of PP1**

| | Item | Year | 2023 | | | | | | | | 2024 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Month | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 Q | 2 Q | 3 Q | 4 Q |
| | Developing the draft Action Plan for promoting source separation in Sid Municipality | | | | | | | | | | | | | |
| | Finalizing the Waste Categories (RW/LW/SW) by coordinating IPA's, RMR's, and Sid's plan of separation. | | | | | | | | | | | | | |
| 1. | Utilization of IPA project's awareness materials | | | | | | | | | | | | | |
| 2. | Improvement of the way that Yellow Containers are used | | | | | | | | | | | | | |
| 3. | Development and distribution of leaflet that covers all waste types | | | | | | | | | | | | | |
| 4. | School program focusing on the waste separation | | | | | | | | | | | | | |
| 5. | Activities related to PP3, PP4, and PP5 | | | | | | | | | | | | | |
| 6. | Development of Short video clip for awareness raising | | | | | | | | | | | | | |
| | PP 3. Procurement of 1.1 m3 containers | | | | | | | | | | | | | |
| | PP 4. Chipping Machine Handover | | | | | | | | | | | | | |
| | PP 5 Operation of Recycling Yard | | | | | | | | | | | | | |
| 7. | Installation of New Bins and Containers | | | | | | | | | | | | | |
| | Endline Survey | | | | | | | | | | | | | |
| 8. | Awareness for enhencing Reduction and Reuse | | | | | | | | | | | | | |
| 9. | Planning of improving the way of using Blue Containers & implement the action | | | | | | | | | | | | | |

## LESSONS LEARNT

- ✓ Discharge Rules (Separation Rules) should
    - Be based on the technical plan of waste management of own municipality.
    - Include **all types of waste** that are expected to be discharged from HHs. Leave no waste that does not have destinations.
- ✓ **Repeated messages** via different types of media (leaflet, SNS, radio, TV, direct talks) increase the awareness.
- ✓ School activity
    - Should carry the message in line with the technical plan **of own municipality**, to avoid any confusions.
    - Is effective when classroom activity, site visit (to MRF), and discussion are conducted **in a series**.
- ✓ Blue bin may help better separation at GSs, where door-to-door collection is possible, when considering expansion to other areas.
- ✓ Behavior-inducing arrangement (such as very visible signs, additional bins for glass bottles) also need to be considered, in order to reduce people's misjudgment or confusion.

## B PP2: Promotion of Home Composting

### 1 Plan of PP2

### 1.1 Background

- The biodegradable waste (kitchen waste and GW) accounts for 50% of the MSW in Sid Municipality and will be a great burden on the transportation and landfill cost under the RWMS.
- Moreover, the National Program aims to reduce the disposal of biodegradable waste and encourages composting them, while the current composting rate (HHs who claim to compost at GSs) in Sid municipality is only **1.8%** as a whole according to the POS.
- Therefore, PUC and Sid municipality decided to carry out this PP to promote home composting in cooperation with JET.

### 1.2 Objectives, Target and Indicators

- **Objectives:** HHs that practice home composting will increase.
- **Target:** Approx. 1500 HHs in the southern -west quarter of Sid Commune
- **Indicator:**% of HHs that conduct home composting in the entire PP area (by End-line survey)

In order to understand the current situation, a baseline survey was carried out in the target area. In regard to home composting, the following was found.

**Table 57 Opinions on Home Composting**

| Please choose one of the following which applies to you. | Share |
|---|---|
| I do home composting and I am satisfied with my compost. | 6% |
| I do home composting and I want to improve it. | 8% |
| I do not do home composting but I want to start it. | 13% |
| I do not do home composting and I do not intend to do it. | 73% |

Those who do not do home composting but want to start it, which account for 13% of the HHs, are considered to be the main target group of this PP.

### 1.3 Activity Plan

There are largely two types of composting.

- Conventional composting: composting in a hole dug in the ground as often seen in the city.
- Bin composting: composting in a specially designed bin.

JET and PUC developed an activity plan as follows.

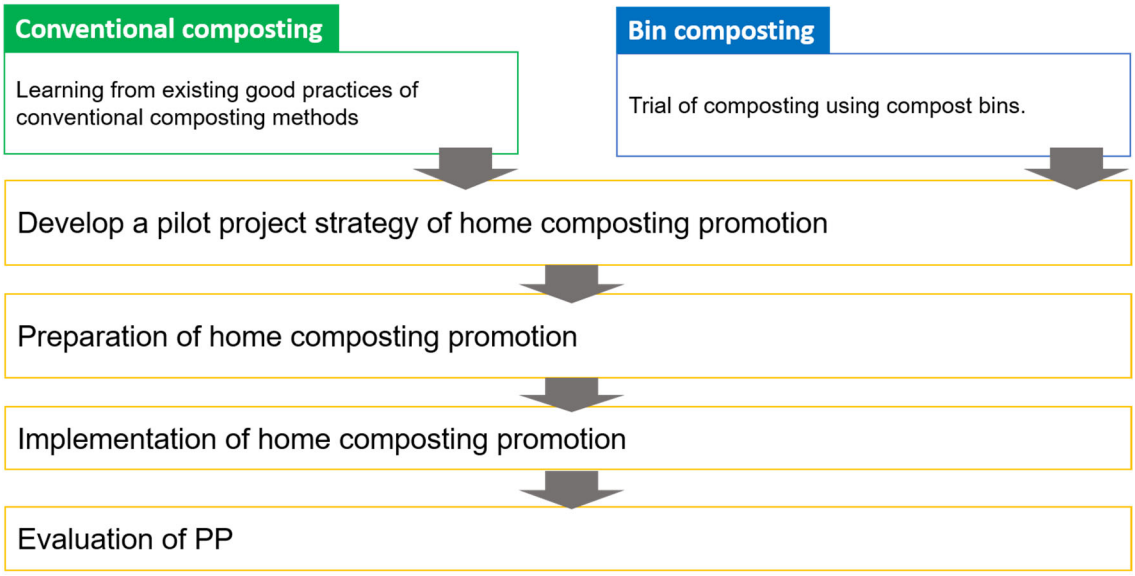



**Figure 51 Acticity Plan of PP2**

### 1.4 Planned Inputs

- JET
  - Printing cost of informational materials
  - Compost bins
- PUC
  - Compost trial members
  - Monitoring staff

## 2 Implementation of PP2

### 2.1 Learning from existing good practices of conventional composting methods

- The conventional method is to dig a hole in the garden, enclose it on all sides, and put waste into and cover it with soil.
- JET gathered information and recorded the on-going practice of conventional composting.
- It was found that the method is good as it is simple and does not require equipment.
- However, it was also found that the method needs large garden. This can be a drawback to its widespread promotion in Sid Commune.

**Figure 52 Conventional Home Composting**

## 2.2 Trial of compost bins

- A 320-litter compost bin was chosen as it was immediately available.
- Before trial, a compost bin user manual was prepared.
- 4 HHs of PUC, the municipality and JET staff were selected as trial members.
- Findings from trial were accumulated and incorporated into the manual.

**Figure 53 Compost Bin and its Inside**

## 2.3 Develop a PP strategy of home composting promotion

Based on the lessons of the current practice of conventional composting and the findings from the trial, PUC and JET decided:

- To promote bin composting to the households whose gardens are not very large
- To procure additional compost bins for full-scale promotion in the PP area.

The bin size was decided to be 320-liter.

- The 320-litter size is found easy to handle.
- Some may request larger bins, but 320 litters will be enough based on the previous experience of JET by enhancing decomposition with proper mixing and watering.

The number of compost bins was decided to be 100 considering the size of PP area and the human resources of PUC and JET for monitoring.

**Figure 54 Compost Bin Actually Being Used in a Home Garden**

## 2.4 Preparation of home composting promotion

- The user manual for home composting with compost bins were updated and notepads (with simplified composting procedures on the back cover) were prepared.
- **User manual:**

Intended to let users know the benefits of composting, its effect on waste reduction, as well as procedures and dos & don'ts in the actual implementation.

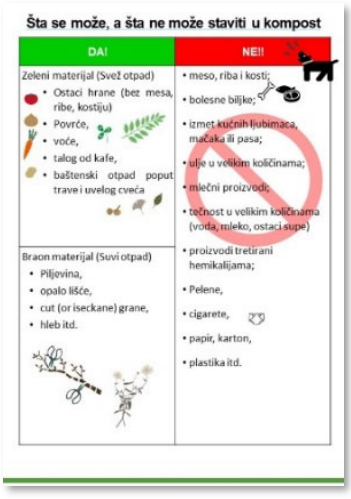




**Figure 55 User Manual**

- **Notepad:**
  Widely distributed to residents of the PP area to generate interest, not only to those who were provided with bins at this time. There is a brief introduction of the composting procedure on the back cover to generate interest in composting.


**Figure 56 Coverpage of Notepad**

- The method of disseminating information of home composting was discussed.
  - A method of going door-to-door and providing explanations in person was adopted.
  - Face to face communication was considered effective for the residents in Sid.
  - To distribute the compost bins as evenly as possible throughout the PP area, the number of bins to be distributed on each street was roughly determined.

## 2.5 Implementation of home composting promotion

### 1) Compost bin distribution

PUC and JET visited each street in the PP area, distributed user manuals and notepads to the HHs and explained how to use the compost bin.

At the same time, compost bins were directly distributed to and assembled at HHs that showed interest to implement composting.

**Figure 57 Compost Bin Distribution**

### 2) Information exchange on Viber

A Viber group "Komposteri Sid" was set up as a tool for information exchange among the users

and for follow-up by PUC and JET. This group monitors the implementation status of the distributed compost bins. When the users post photos of their compost, PUC checks type and condition of waste in the bin and gives advice to them. If the waste in the bin is found too big (e.g. big leaves or a whole fruit), PUC gives advice to cut them into small pieces. If the compost looks dry, it is advised to add some water or mix the compost well.

A separate management Viber group was set up as a monitoring tool involving four members including the PUC's main person in charge of composting, three members from JET. JET assisted PUC with giving appropriate advice for users, referring to the aforementioned "Komposteri Sid".

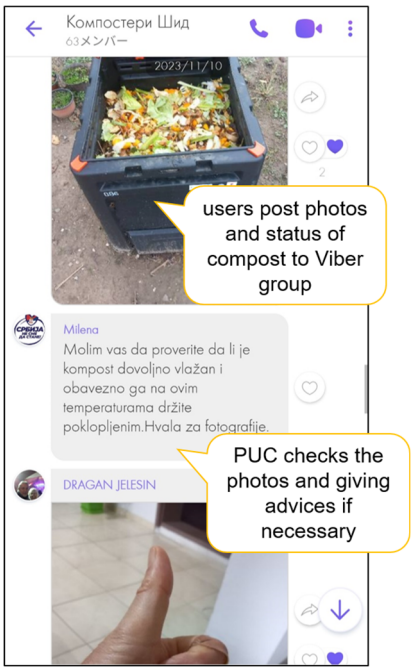



**Figure 58 Screen Shot of Viber**

### 3) Door-to-door monitoring

- To understand the status of the compost of each HH, PUC and JET directly visited all HHs who have received compost bins.
- This is to identify issues for the users not posting to the Viber group. Direct visit is also good to check actual condition of the users posting photos because their photos only show the surface of the compost.
- Close monitoring in early stage of home composting was very important **to keep participants motivated to continue composting activities**. The monitoring methodology is described as follows.

**Figure 59 Monitoring of the Use of Compost Bins**

A monitoring form was created using the Google form to check the status of each compost bin. This form can be filled out by the users or the monitors on the spot with a smartphone.
Using this form, PUC (&JET) visited the households to check whether the composting activities are continued (or even started). And checking the aspects listed in the table:

**Table 58 Questions asked to Users**

| |
|---|
| Is there any bad odor from the compost bin? |
| Is there any insect in your compost? |
| How is the moisture condition of the compost bin? |
| How often do you mix compost and cover with soil? |
| What types of waste do you add to your compost bin? …etc |

Responses from users put into the form are automatically tabulated in the spreadsheet. From here, it is easy to see which compost bins were used and to grasp their condition and problems. By looking at the trends in the responses, it is possible to determine what kind of guidance is needed for users (e.g., if any users are not mixing the compost, ask them to do so again, etc.).

### 4) Input for Conventional Method Composting

- Under this PP, direct support for the dissemination of conventional method composting is not provided. However, the conventional method is a simple and effective method for the households with large garden. Therefore, JET prepared a manual for the conventional method and provided PUC with it to assist for its promotion.

**Figure 60 Conventional Composting conducted by a Sid resident**

## 2.6 Evaluation of PP

- The end-line survey waste carried out.
  - Those who practice composting increased from 14% (6+8) to **19%** (11+8).
  - Those who do not home composting yet but want to start it also increased from 13% to **23%**.
  - It is considered that composting has been more practiced and widely recognized among the HHs in the PP area.

**Table 59 End-line Survey Results**

| Please choose one of the following which applies to you. | | |
|---|---|---|
| | Baseline | End-line |
| I do home composting and I am satisfied with my compost. | 6% | 11% |
| I do home composting and I want to improve it. | 8% | 8% |
| I do not do home composting but I want to start it. | 13% | 23% |
| I do not do home composting and I do not intend to do it. | 73% | 53% |
| I tried doing home composting but I gave up. | | 4% |
| Others | | 1% |

- According to the results from the compost monitoring by PUC and JET (as of February 2024), almost 80% of the users continue to use compost bins or will resume composting when the weather gets warmer. (Out of 100 users, 67 are using, and 12 are planning to resume using the compost bins when spring arrives or it gets warmer).
- Out of the users who keep on using the compost bins over this winter, over 90% of them are properly managing their compost, adding waste in appropriate way (cutting the foods and GW small when they add them), and they do not have any bad odor or insects.

**Actual Inputs**

- JET

✓ 100 Compost bins **EUR 3,300**

✓ Printing of user manual (A5, Color, 8 pages,200 copies) and notepad(A6, 50 pages, 300 copies) **RSD 77,400**

✓ POS (Baseline and End-line) (together with PP1) **10 person x 3 days x 2 times**

✓ Monitoring of the Progress (1 person + vehicle) x 4 months

- PUC

✓ 1 Person in charge

  - Bin distribution (7 days)

- Occasional communication on Viber
- Monitoring (4 months)

## 3 PP2 (Home Composting Using Compost Bins) Cost-Effectiveness Evaluation

Evaluation of the Cost-Effectiveness of Compost Bins Procurement and Deployment in PP2 as follows:

**a. Target Population:**

- Number of households who received compost bins: 100 households within the PP area
- Population of PP area: 2,994 individuals (According to PUC-provided data)
- Number of households in PP area: 1,251 households (As above)
- Average household size: 2.4 persons/household

**b. Expenditure**

**b.1 Cost of purchasing compost bins (100 units):**

- Purchase cost of compost bins: 3,300 euros = 525,644 yen / 1.39451 = 376,938.136 RSD

(JICA's exchange rate for September 2023: 1 euro = 159.286 yen, and 1 RSD = 1.39451 yen)

**b.2 Monitoring expenses:**

Personnel costs required for monitoring is calculated based on the following conditions:

- The monitoring period for directly visiting households to which compost bins were distributed is set at 3 months after distribution. This monitoring is conducted intensively so that the bins will be used appropriately and continuously and residents' awareness will be maintained, by to identifying and solving the challenges faced by residents immediately after the start of compost bin usage.
- Based on actual monitoring data, it was possible to visit 100 compost bins once a month.
- Since monitoring was carried out in coordination with other PUC tasks, one PUC staff member conducted visits to the 100 compost bins, requiring 2 hours per day for 10 days.
- PUC personnel cost: Hourly rate of 450 RSD.

Therefore, the personnel cost for monitoring is calculated as:
(450 RSD × 2 hours × 1 person) × 10 days × 3 months = **27,000 RSD**

**b.3 Printing costs:**

Manuals for home composting (unit price of 225 RSD) and notepads (unit price of 108 RSD) were printed and distributed to residents in the PP area for compost promotion and public awareness. Therefore, these printing costs are also included in the expenses.

- Printing cost: (225 + 108) × 100 = 33,300 RSD

The total input for the first year for 100 compost bins is as follows:

- 376,938.136 + 33,300 + 27,000 = **437,238.14 RSD**

**c. Calculation of Waste Reduction from Each Household Due to Home Composting**

The waste reduction per household is calculated as follows:

- Average waste generation per household (refer to ): 1,022g/person/day × 2.4 persons = 2,453g/day/household
- Amount of waste input into the compost:

The waste input into home composting consists of kitchen waste (KW) and green waste (GW). According to the WACS survey, KW accounts for 27.39% of household waste, and GW accounts for 36.77% (refer to Table 58).

**Table 60 Generation Rate of Household Waste in Sid Commune**

| No | Indicators | Value | |
|---|---|---|---|
| | Date of the previous collection | 2022/06/28 | |
| | Date of the survey | 2022/07/05 | |
| 1 | Generated days | 7 | days |
| 2 | Amount of waste collected for the survey | 14,670 | kg |
| | Number of households | 806 | households |
| 3 | Number of residents | 2,056 | persons |
| | Waste generation rate | 1,019 | g/person/day |

**Table 61 Waste Composition of Household Waste in Sid Commune**

| No | Types | Recorded weights (kg) | Physical Composition (%) |
|---|---|---|---|
| 1 | Paper and cardboard | 107.6 | 3.82% |
| 2 | PET | 60.7 | 2.15% |
| 3 | Plastic bags | 108.8 | 3.86% |
| 4 | Other plastics | 76.6 | 2.72% |
| 5 | Aluminum cans | 10.0 | 0.35% |
| 6 | Metal ferrous packaging | 14.1 | 0.50% |
| 7 | Other metals | 0.4 | 0.01% |
| 8 | Glass | 46.7 | 1.66% |
| 9 | Textile | 110.4 | 3.91% |
| 10 | Composite materials | 19.6 | 0.70% |

| | | | |
|---|---|---|---|
| 11 | Other packaging waste | 13.2 | 0.47% |
| 12 | Rubber | 6.2 | 0.22% |
| 13 | Fine particles | 318.3 | 11.29% |
| 14 | Kitchen waste | 772.4 | 27.39% |
| 15 | GW | 1,037.0 | 36.77% |
| 16 | Other | 79.9 | 2.83% |
| 17 | Hazardous waste | 3.1 | 0.11% |
| 18 | WEEE | 5.9 | 0.21% |
| 19 | Bulky waste | 29.1 | 1.03% |
| | Total | 2,820.0 | 100.00% |

GW includes pruning waste (PW/GW) and non-pruning waste (leaves, grass, etc., Non-PW), of which Non-PW is suitable for composting. It is assumed that PW/GW and Non-PW are generated in approximately equal proportions.

Therefore, Non-PW accounts for 36.77% × 0.5 = 18.385% of household waste (as all compost bin users put in Non-PW to the bin).

It is assumed that half of KW can be composted since meat and bones are not put into compost bins for management reasons. Furthermore, about 90% of compost bin users answered that they put KW into the compost bins during monitoring.

Therefore, the actual composted KW is estimated as 27.39% × 0.5 × 0.9 = 12.3255%.

Hence, the amount of household waste composted is calculated as follows:

2,453g × (12.3255% + 18.385%) = **753.33g/day/household**

Thus, it is assumed that each household receiving a compost bin will reduce waste by 753.33g/day/household.

### d. Reduction in Waste Disposal Costs Due to Reduction in Household Waste Generation

As mentioned above, the amount of waste collected from households and taken to regional disposal sites is reduced due to home composting. Therefore, the cost of transporting to and tipping fees at regional disposal sites is reduced.

The per-ton collection and transportation cost calculated by this project is as follows. Note that waste is collected by CT from each household in the PP area, and this cost is utilized.

1. Transport and entry cost to regional disposal sites: 10,742 RSD/ton
2. Reduction in costs due to the decrease in waste amount of 753.33g/day/household:
   753.33g/day/household = 0.00075333 tons/day/household
   10,742 RSD/ton × 0.00075333 tons/day/household = 8.092271 RSD/day

3. Annual reduction in cost per household:
   8.092271 RSD/day × 365 days = 2,953.679 RSD/year
4. Annual reduction cost for all 100 households:
   2,953.679 RSD/year × 100 households = 295,367.9 RSD

**e. Cost-Effectiveness**

**e.1 Quantitative Evaluation**

The lifespan of compost bins is set at 5 years based on the material and usage conditions of the compost bins.

The cost reduction over 5 years is calculated as follows from point 4) above:

295,367.9 RSD/year × 5 years = 1,476,839 RSD
Benefit/Cost = 1,476,839 RSD / 437,238.14 RSD = 3.38

Thus, the cost-effectiveness is considered sufficient.

**e.2 Qualitative Evaluation**

If composting proceeds smoothly, residents can obtain soil improvers. In addition, some households that received compost bins have reported that "almost no waste has been generated since starting to use the compost bin," indicating benefits for citizens.

## 4 Review of the A/P

- In the A/P, it is planned to promote home composting using part of kitchen waste that is suitable for composting and non-PW such as fallen leaves and flowers, this is considered appropriate.
- However, to disseminate home composting to the whole Sid Commune, it is necessary to reduce financial burden of PUC.
  - ✧ Following measures are recommended;
    - ✓ Securing external source of fund to procure 3 times as many compost bins as the PP
    - ✓ Utilizing prepared conventional composting manual to encourage HHs with large garden to adopt this method

## LESSONS LEARNT

- ✓ Home composting is recommended for
  - HHs which have gardens where product compost can be used.
  - For HHs with large garden, conventional method is suitable as it is simpler.
- ✓ Provision of a compost bin may not be enough for people to start composting. It must be ensured that they make the first step forward.
  Several HHs had not started yet three months after the bin distribution.
- ✓ Distribution of manual is not enough.
  Several HHs had never mixed the content in the bins for the first three months, as they did not know that they had to do so, even though it was instructed to do so in the manual.
- ✓ Monitoring is fatally important, especially in early stages, because:
  - Monitoring can encourage the HHs who somewhat hesitate to start.
  - Monitoring can detect misunderstanding of the users as soon as possible and correct their practice.
  - Monitoring can offer a learning opportunity for PUC.
  - It may be possible to transfer the bins to others if somebody gives up.
- ✓ Cutting, mixing and watering are essential.
  These three are the key words to solve most of the problems and to keep compost healthy.
- ✓ When starting promotion of home composting, it is effective to target a group of people who are already interested in home composting.

## C PP3: Optimization of Waste Collection and Transportation

# 1 Plan of Pilot Project

## 1.1 Background

In Sid Municipality, waste collected with a SL from large containers (5m$^3$ and larger) accounts for 25% of the total collected waste.

**As SL collection is not efficient when the DS is far from the CAs,** Sid Municipality originally planned to construct a TS at the current DS. This would allow the waste collected with the SL to be transferred to a large CT for disposal at the remote RLF.

However, due to land-related issues, the construction of the TS became unfeasible.

Consequently, the PUC of Sid revised the plan to replace the larger containers with small ones (1.1 m$^3$), collect the waste using a large CT, and then transport the collected waste directly to the RLF.

The PP3 shall be conducted by the PUC with the support of the JET.

## 1.2 Purpose and Objectives

- ☐ Purpose of the PP

To test the feasibility of the basic approach adopted in the A/P related to the Optimal Collection and Transportation Plan by evaluating the achievements of the following two objectives.

- Objective-1:

The waste collection and transportation system will be optimized by replacing the SL and large containers with CTs and small containers (1.1 m$^3$).

- Objective-2:

Waste collection services in the underserved areas of Sid municipality will be improved.

## 1.3 Target Area

- ☐ Target locations for Objective-1:

  Part of the GSs whose waste is collected with the SL:

  - To be selected from the 12 locations where PUC-owned large containers (5 m$^3$) are placed

- ☐ Target locations for Objective-2:

  - Molovin Commune and some other areas selected from underserved areas in Sid Municipality

## 1.4 Activities

- Development of a draft A/P related to the optimal collection and transportation plan
- Finalization of the target areas
- Planning of the PP3
    1. Study the amount of waste being discharged in the selected locations.
    2. Determine the number of 1.1 $m^3$ metal containers required for the PP and develop a corresponding container installation plan.
    3. Prepare collection & transportation schedule.
- Implementation of the PP
    1. Procure 1.1 $m^3$ containers and a 22 $m^3$ CT.
    2. Install the 1.1 $m^3$ containers
    3. Conduct the collection service with 22 $m^3$ CT
- Review of the A/P
    1. Evaluate the PP
    2. Review the component of the A/P related to the optimal collection and transportation plan

## 1.5 Indicators & Necessary Inputs

- Indicators
    1. Objective-1: Comparison of cost and time efficiency between the SL operation (before PP) and the CT operation (after PP)
    2. Objective-2: Sufficiency of the collection service provided in the underserved areas selected for the PP
- Data collection method
    1. For cost and time efficiency: T&M Survey and WB
    2. For **s**ufficiency of the collection service: Interview survey with residents of the areas selected for Objective-2
- Necessary Inputs
    - JET
        - ✓ Procurement of 22 $m^3$ CT
        - ✓ Procurement of 1.1 $m^3$ metal containers for the PP3
    - PUC
        - ✓ Provision of 22 m3 CT with driver and workers for implementation of the PP

## 2 Implementation of PP3

### 2.1 A/P (draft) related to the optimal collection and transportation plan

- Background

- Change of the destination: from Sid DS=>RWMC
  - Recyclable Waste to the Regional MRF
  - LW to the RLF
- Impact by the change of the destination on CT operation efficiency and SL operation efficiency

**Table 62 Changes Estimated in Collection and Transportation**

| No | Indicators | Unit | CT Operation | | | | SL Operation | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | To Sid DS | To RLF | Change | | To Sid DS | To RLF | Change | |
| 1 | Waste per km | kg/km | 172 | 35 | -137 | -80% | 62 | 8 | -55 | -88% |
| 2 | Waste per hr | kg/hr | 1,857 | 784 | -1,073 | -58% | 1,254 | 224 | -1,030 | -82% |

Note: Estimations based on the results of the T&M Survey conducted by JET in 2021

⇨ Negative impact on efficiency is more significant for SL operation than CT operation.

- Basic Approach

Substitute the SL with more efficient CTs while optimizing the CAs allocated to each truck and waste collection routes.

**Table 63 Planned Actions**

| Actions | Year | 2023 | | | | 2024 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Month | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 | Update the list of generation sources whose waste is collected by the skip loader. | | | | | | | | |
| 2 | Study the characteristics (dimension, type, etc.) of waste discharged by each source and identify the locations/sources where the large containers can be replaced with 1.1 $m^3$ containers. | | | | | | | | |
| 3 | Identify the ownership of the large containers placed at each of the locations/sources. | | | | | | | | |
| 4 | Study the amount of the waste discharged by each source and determine the number of 1.1$m^3$ containers required for the replacement. | | | | | | | | |
| 5 | Prepare a container replacement plan (schedule). | | | | | | | | |
| 6 | Notify the sources using the PUC-owned large containers about the container replacement and install 1.1 $m^3$ containers. | | | | | | | | |

| Actions | Year | 2023 | | | | 2024 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Month | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 7 | Optimize the collection and transportation plans, with the changes defined in the A/P reflected (Adjust the CT/SL's collection areas, review collection frequency/days/orders for each source, determine the destinations for each type of waste, revise the collection routes and schedule). | | | | | | | | |
| 8 | Implement the updated collection plan. | | | | | | | | |

## 2.2 Finalization of Target Areas

### 1) Target Locations for Objective-1

10 locations where PUC-owned large containers are placed

*(Figures in the bracket show the number of large containers placed at the locations)*

- Sid:
  - #01. Naselje Istok (5)
  - #02. Naselje Jelica (3)
  - #03. Pijaca (green market) (2)
  - #04. Zgrada Masarikova stambena zgrada (1)
  - #05. Tehnička škola (2)
  - #12. Dom zdravlja Šid (1)
- Berkasovo:
  - #10. Lipovača (1)
- Sot:
  - #07. Jezero Sot (1)
- Gibarac:
  - #06. Groblje Gibarac (1)
- Visnjicevo:
  - #11. Višnjićevo (commune) (2)

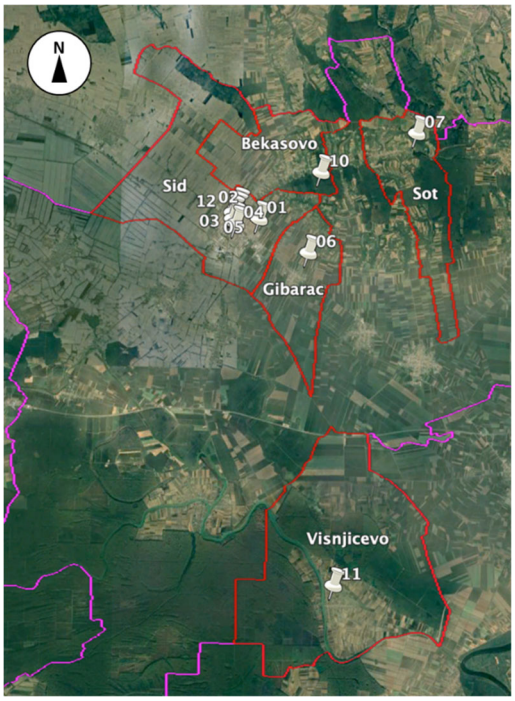



**Figure 61 Large Containrts Locations**

### 2) Target Locations for Objective-2

4 locations where the collection service is not sufficient

- #13: Jezero Moharač
- #14: Telek
- #15: Gradina
- #16: Molovin (commune)

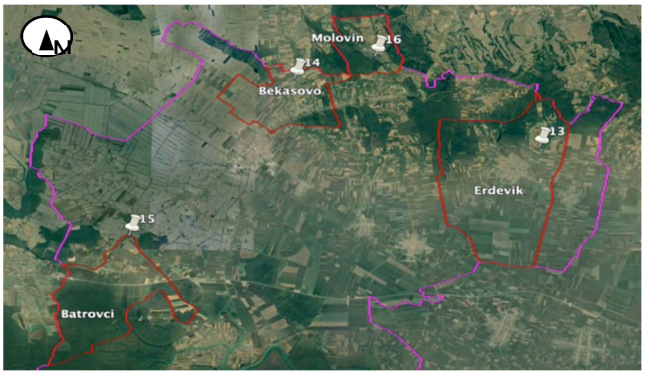



**Figure 62 Insufficient Service Locations**

### 3) Description of the underserved areas selected

- Jezero Moharac
  - A tourist destination (seasonal residency), with some residential areas (year-round residency) on both sides of the lake.
  - The narrow dam road and winery pathways restrict truck access to each source
  - Single 1.1 $m^3$ container placed, with 3 times/month collection
  - Container capacity issues during the tourist season
- Telek
  - Weekend Houses located 1 km south of the Croatian border, with year-round residency increasing
  - Underdeveloped roads and fenced properties with arched orchards restrict truck assess
  - Single 1.1 $m^3$ container, with weekly collection, is insufficient for increased waste during peak seasons.
- Gradina
  - Villa area along Bosut River, adjacent to Vasica commune.
  - Increase in year-round HHs, especially on the Vasica side.
  - Lack of developed roads and soft ground near the river restricting truck access
  - Single 1.1 $m^3$ container, with weekly collection, overflow, and illegal burning issues.
- Molovin Commune
  - Increased services since spring 2023
  - Elevated residential areas, with HHs along the main road accessible
  - Challenging terrain and road icing during the winter in the northern highland areas further restrict truck access
  - Four 1.1 $m^3$ containers, with weekly collection, are insufficient for the commune

## 2.3 Implementation of the PP

### 1) Container Installation (from 15 Oct to 30 Nov)

- Replacement at the Objective-1 locations
- Addition at the Objective-2 locations

**Table 64 Container Information**

| No | Locations | Before PP | | | After PP | | |
|---|---|---|---|---|---|---|---|
| | | 5 $m^3$ | 1.1 $m^3$ | Total volume ($m^3$) | 5 $m^3$ | 1.1 $m^3$ | Total volume ($m^3$) |
| **Locations selected for Objective-1: Replacement** | | | | | | | |
| #01 | Naselje Istok | 5 | | 25.0 | 0 | 28 | 30.8 |
| #02 | Naselje Jelica | 3 | | 15.0 | 0 | 15 | 16.5 |
| #03 | Pijaca | 2 | | 10.0 | 0 | 16 | 17.6 |
| #04 | Zgrada Masarikova stambena zgrada | 1 | | 5.0 | 0 | 5 | 5.5 |
| #05 | Tehnička škola | 2 | | 10.0 | 0 | 5 | 5.5 |
| #06 | Groblje Gibarac | 1 | | 5.0 | 0 | 5 | 5.5 |
| #07 | Jezero Sot | 1 | | 5.0 | 0 | 3 | 3.3 |
| #10 | Lipovača | 1 | | 5.0 | 0 | 3 | 3.3 |
| #11 | Višnjićevo | 2 | | 10.0 | 0 | 9 | 9.9 |
| #12 | Dom zdravlja Šid | 1 | | 5.0 | 0 | 10 | 11.0 |
| **Locations selected for Objective-2: Addition** | | | | | | | |
| #13 | Jezero Moharač | | 1 | 1.1 | | 2 | 2.2 |
| #14 | Telek | | 1 | 1.1 | | 2 | 2.2 |
| #15 | Gradina | | 1 | 1.1 | | 3 | 3.3 |
| #16 | Molovin | | 4 | 4.4 | | 9 | 9.9 |

Note: The total volume of the installed containers for #05, #07, and #10 decreased due to the planned increase in the collection frequency under the PP.


**Figure 63 Container Installation**

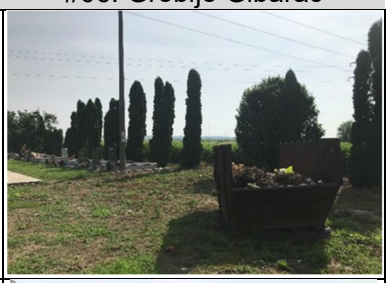
| #01. Naselje Istok | #03. Pijaca (green market) | #06. Groblje Gibarac |
|---|---|---|
|  |  |  |
|  |  |  |

**Figure 61 Before and after of the PP**

## 2) Preparation of Collection Plans

### a. Collection Schedule

- Collection day for each location/source
- Locations/Sources for each trip
- **Items considered:** expected waste, current collection frequency, number of containers, and geographic location
- One trip per day and one cycle in a week

**Table 65 Collection Schedule**

| No | Locations | Containers placed (pcs) | Collection frequency (times/week) | Collection schedule (Collection orders in the brackets) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
| | **Locations selected for Objective-1:** | | | | | | | | | |
| #01 | Naselje Istok | 28 | **7** | Collect. (3) | Collect. (4) | Collect. (4) | Collect. (3) | Collect. (5) | Collect. (3) | Collect. (3) |
| #02 | Naselje Jelica | 15 | **7** | Collect. (2) | Collect. (2) | Collect. (3) | Collect. (2) | Collect. (3) | Collect. (2) | Collect. (2) |
| #03 | Pijaca | 16 | **7** | Collect. (1) | Collect. (1) | Collect. (1) | Collect. (1) | Collect. (1) | Collect. (1) | Collect. (1) |
| #04 | Zgrada Masarikova stambena zgrada | 5 | **2** | | Collect. (3) | | | Collect. (4) | | |
| #05 | Tehnička škola | 5 | **1** | | | Collect. (2) | | | | |
| #06 | Groblje Gibarac | 5 | **1** | | | | | Collect. (6) | | |
| #07 | Jezero Sot | 3 | **1** | Collect. (4) | | | | | | |
| #10 | Lipovača | 3 | **1** | Collect. (6) | | | | | | |
| #11 | Višnjićevo | 9 | **1** | | Collect. (6) | | | | | |
| #12 | Dom zdravlja Šid | 10 | **1** | | | | | Collect. (2) | | |
| | **Locations selected for Objective-2:** | | | | | | | | | |
| #13 | Jezero Moharač | 2 | **1** | | | Collect. (7) | | | | |
| #14 | Telek | 2 | **1** | Collect. (7) | | | | | | |
| #15 | Gradina | 3 | **1** | | Collect. (5) | | | | | |
| #16 | Molovin | 9 | **1** | Collect. (5) | | | | | | |

**b. Daily Collection Plans and Routes**


**Figure 64 Daily Collection Routes**

**Table 66 Monday Daily Collection Plan**

| Order | ID | Origin/Sources/Destination | Length (km) | Waste (kg) | Operation hours | | |
|---|---|---|---|---|---|---|---|
| | | | | | Collection | Movement | Total |
| Start | A | PUC | | | | | |
| 1 | #03 | Pijaca | 0.70 | 1,620 | 00:26 | 00:01 | 00:27 |
| 2 | #02 | Naselje Jelica | 0.90 | 926 | 00:15 | 00:01 | 00:16 |
| 3 | #01 | Naselje Istok | 2.30 | 1,851 | 00:30 | 00:03 | 00:34 |
| 4 | #07 | Jezero Sot | 10.80 | 486 | 00:08 | 00:18 | 00:26 |
| 5 | #16 | Molovin | 4.00 | 1,296 | 00:21 | 00:06 | 00:28 |
| 6 | #10 | Lipovača | 10.20 | 972 | 00:16 | 00:17 | 00:33 |
| 7 | #14 | Telek | 4.30 | 324 | 00:05 | 00:07 | 00:12 |
| DS | B | Regional Landfill | 53.90 | | | 01:32 | 01:32 |
| End | A | PUC | 48.10 | | | 01:22 | 01:22 |
| | | | | | | | |
| | | Trip totals | 135.20 | 7,475 | 02:03 | 03:51 | 05:54 |

### 3) Collection and Transportation

- **Implementation Period:** 28 days from 1 Dec 2023


**Figure 65 Collection from #15.Gradina (SI-038-JV on 4 December)**

**Figure 66 Collection from #12.Dom Zdravlja Sid (SI-038-JV on 8 December)**

## 2.4 Actual Inputs

**Table 67 Inputs and Costs**

| No | Category | Quantity | | Unit Price | | Project cost (RSD) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | Investment: | | | | | | |
| | Compactor truck | 1 | unit | 15,795,000 | RSD/unit | 15,795,000 | Body volume-22 m3; 135,000 euro/unit; 1 euro=117 RSD |

| No | Category | Quantity | | Unit Price | | Project cost (RSD) | Remark |
|---|---|---|---|---|---|---|---|
| | Containers | 114 | pc | 41,768 | RSD/pc | 4,761,552 | Capacity-1.1 m3, 357 euro/pc, 1 euro=117 RSD |
| | Total investment | | | | | 20,556,552 | |
| 2 | Operational costs: | | | | | | |
| | Man power: | | | | | | |
| | Driver | 99 | psn*hr | 453 | RSD/psn*hr | 44,893 | Total hours of 3 drivers |
| | Worker | 99 | psn*hr | 424 | RSD/psn*hr | 42,096 | Total hours of 3 workers |
| | Materials: | | | | | | |
| | Fuel | 728 | liter | 193 | RSD/liter | 140,075 | 1,224 km by all 3 CTs; (Consumptions on Slide-26) |
| | Lubricants | 36 | liter | 1,000 | RSD/liter | 36,383 | 5% of the quantity of fuel |
| | Other costs | | | | | | |
| | Toll fee | 4 | trips | 1,300 | RSD/trip | 5,200 | |
| | Disposal fee (Sid) | 57 | ton | 117 | RSD/ton | 6,689 | 1 euro/ton (JET assumption) |
| | Disposal fee (RLF) | 12 | ton | 2,808 | RSD/ton | 33,359 | 24 euro/ton (Srem Macva) |
| | Total operational costs | | | | | 308,694 | |
| | Project cost | | | | | 20,865,246 | |

## 2.5 Evaluation

### 1) Comparison of Cost and Time Efficiency

**a. Summary:**

- **Implementation period:** 28 days from 1 Dec 2023
- **Trucks used:** 3 CTs (8 $m^3$, 20 $m^3$ and 22 $m^3$)
- **Conducted trips:** 28 trips (1 trip per day)
  - 4 trips to RLF
  - 24 trips to Sid DS
- Amount of waste collected throughout the PP: 69,050 kg (2,466 kg per trip)

**Table 68 Waste Amount Collected throughtout the PP**

| No | Destination | Truck | Capacity ($m^3$) | Trips | Waste (kg) |
|---|---|---|---|---|---|
| 1 | RLF | ŠI-038-JV | 20 | 4 | 11,880 |
| 2 | Sid DS | ŠI-038-JV | 20 | 7 | 18,480 |
| | | ŠI-035-IL | 22 | 9 | 22,790 |
| | | ŠI-001-MP | 8 | 8 | 15,900 |
| | | Subtotal | | 24 | 57,170 |
| | Grand total | | | 28 | 69,050 |

Note: The amount of waste as registered with the WBs of the RLF and Sid RY

**b. T&M Survey**

- **Survey period:** 7 days (from 4 to 10 Dec 2023)
- Purpose:
  - Collect data on time spent, traveled length, and waste amount
  - Identify container utilization at the target locations and the volume of waste discharged into the containers
  - Observe the implementation of the PP

**Table 69 Results of the T&M Survey**

| No | Location | Unit | 12/04 | 12/05 | 12/06 | 12/07 | 12/08 | 12/09 | 12/10 | Survey Total (kg/ week) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Mon | Tue | Wed | Thu | Fri | Sat | Sun | |
| 1 | Destination | | RLF | Sid DS | Sid DS | Sid DS | Sid DS | Sid DS | Sid DS | |
| 2 | Length | km | 135 | 67 | 56 | 11 | 17 | 10 | 11 | 306 |
| 3 | Operation hours | hr | 05:18 | 03:25 | 03:08 | 01:22 | 02:13 | 01:48 | 01:24 | 18:38 |
| | Collection hours | hr | 01:42 | 01:35 | 01:21 | 00:51 | 01:16 | 01:07 | 00:58 | 08:50 |
| | Movement hours | hr | 03:36 | 01:50 | 01:47 | 00:31 | 00:57 | 00:41 | 00:26 | 09:48 |
| 4 | Amount of waste | kg | 3,140 | 2,700 | 2,260 | 1,380 | 2,160 | 2,990 | 2,500 | 17,130 |

**c. Estimation of Waste Collected from the Target Locations Grouped by the PP Objectives**

- Amount of waste collected throughout the PP: 69,050 kg
- Groups of the target locations:

- Locations selected for Objective-1 (**those previously collected by the SL**)
- Locations selected for Objecitve-2

**Table 70 Amount of Collected Waste in the Target Locations**

| No | Location | Share of the location groups in the T&M Survey Total Waste (estimations based on $m^3$) | Amount of waste based on the left (kg) |
|---|---|---|---|
| 1 | Locations selected for Objective-1 | 87.3% | 60,280 |
| 2 | Locations selected for Objective-2 | 4.2% | 2,909 |
| 3 | Non PP target locations | 8.5% | 5,861 |
| | Total | 100.0% | 69,050 |

Note: The volume of waste ($m^3$) were determined based on observation during the T&M Survey conducted in Dec 2023.

**d. Indicators of SL Operation before PP**

- Data Source: T&M Survey conducted by JET in 2021
- Difference with CT: 1 container in one trip, impossible to collect two or more sources in the same trip
- Amount of waste: 60,280 kg (See the previous slide)

**Table 71 Indicators of SL Operation before PP**

| PP No. | Locations | 5 $m^3$ containers | Collection frequency | | Trip length (km/trip) | | Trip time (hr/trip) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Trip to Sid DS | Trip to RLF | Collection | Movement (Speed: 31 km/hr) | |
| | | | | | | | | Trip to Sid DS | Trip to RLF |
| 1 | Naselje Istok | 5 pcs | 3 | times/week | 8.4 | 95.8 | 00:15 | 00:16 | 03:05 |
| 2 | Naselje Jelica | 3 pcs | 3 | times/week | 6.8 | 99.0 | 00:15 | 00:13 | 03:11 |
| 3 | Pijaca | 2 pcs | 7 | times/week | 5.4 | 97.6 | 00:15 | 00:10 | 03:08 |
| 4 | Zgrada Masarikova stambena zgrada | 1 pcs | 1 | times/week | 7.4 | 97.8 | 00:15 | 00:14 | 03:09 |
| 5 | Tehnička škola | 2 pcs | 1 | times/month | 5.2 | 98.0 | 00:15 | 00:10 | 03:09 |
| 6 | Groblje Gibarac | 1 pcs | 1 | times/month | 13.8 | 90.2 | 00:15 | 00:26 | 02:54 |
| 7 | Jezero Sot | 1 pcs | 3 | times/month | 25.6 | 117.2 | 00:15 | 00:49 | 03:46 |
| 10 | Lipovača | 1 pcs | 1 | times/week | 17.6 | 109.2 | 00:15 | 00:34 | 03:31 |
| 11 | Višnjićevo | 2 pcs | 1 | times/week | 52.6 | 100.4 | 00:15 | 01:41 | 03:14 |
| 12 | Dom zdravlja Šid | 1 pcs | 1 | times/week | 6.0 | 98.2 | 00:15 | 00:11 | 03:10 |

Note: The distances between the sources and the RLF are measured on Google Earth.

**Table 72 Cost Indicators**

| No | Category | | Unit | Value | Remark |
|---|---|---|---|---|---|
| A | Inputs: | | | | |
| 1 | Driver | | psn | 1 | |
| 2 | Worker | | psn | 1 | |
| 3 | Fuel (consumption) | | | | PUC |
| | CT1: | ŠI-038-JV | liter/km | 0.7 | |
| | CT2: | ŠI-035-IL | liter/km | 0.7 | PUC |
| | CT3: | ŠI-001-MP | liter/km | 0.3 | PUC |
| | SL: | ŠI-021-RB | liter/km | 0.4 | PUC |
| 4 | Lubricants (consumption) | | % of fuel | 5% | PUC assumption |
| B | Price: | | | | |
| 1 | Driver wage | | RSD/hr | 453 | PUC |
| 2 | Worker wage | | RSD/hr | 424 | PUC |
| 3 | Fuel price | | RSD/liter | 193 | www.benzinko.com |
| 4 | Lubricant price | | RSD/liter | 1,000 | www.benzinko.com |
| 5 | Highway tariff | | | | |
| | Trip to | Sid DS | RSD/trip | 0 | |
| | Trip to | RLF | RSD/trip | 1,300 | Actual |
| 6 | Disposal cost | | | | |
| | | Sid DS | RSD/ton | 117 | JET assumption (1 euro/ton) |
| | | RLF | RSD/ton | 2,808 | Srem Macva RWMC (24 euro/ton) |

**e. Cost and Time Efficiency of CT and SL operations**

- **CT's efficiency indicators are higher than those of SL.**
- When the DS changed from Sid DS to RLF, **SL's efficiency decrease will be more significant than CT's** (the decrease in "Waste per km" is 90% for SL and 62% for CT).
- When SL is replaced with CT, **the efficiency increases**. As the SL's efficiency is too low for the trips to RLF, the **increase resulting from the truck change is much more significant** (598% for "Waste per hour" and 693% for "Waste per km").
- **The unit cost** of CT operation is **28% lower** than that of SL for the trips conducted to the Sid DS and **75% lower** for the trips to the RLF.

## Table 73 Cost and Time Efficiency of CT

| No | Category | Unit | Trips to the Sid DS | | Trips to the RLF | | Difference (by %) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | DS Change (Sid=>RLF) | | Truck Change (SL=>CT) | |
| | | | SL | CT | SL | CT | SL | CT | Sid DS | RLF |
| A | **Operation indicators:** | | | | | | | | | |
| 1 | Truck capacity: | | | | | | | | | |
| | Body volume | m3 | 5.0 | 16.8 | 5.0 | 20.0 | | | | |
| | Payload (maximum) | kg | 896 | 6,126 | 896 | 6,428 | | | | |
| 2 | Trips | num | 152 | 24 | 26 | 4 | | | | |
| 3 | Waste | kg | 51,475 | 57,170 | 8,805 | 11,880 | | | | |
| 4 | Total length | km | 1,488 | 789 | 2,560 | 436 | | | | |
| 5 | Operation hours | hr | 85:59 | 81:58 | 89:05 | 17:13 | | | | |
| 6 | Waste per trip | kg/trip | 339 | 2,382 | 339 | 2,970 | | | | |
| 7 | Truck utilization rate (weight base) | % | 38% | 39% | 38% | 46% | | | | |
| 8 | Waste per m3 of truck capacity | kg/m3 | 68 | 142 | 68 | 149 | | | | |
| B | **Efficiency indicators:** | | | | | | | | | |
| | Waste per hr | kg/hr | 599 | 697 | 99 | 689 | -83% | -1% | 16% | 598% |
| | Waste per km | kg/km | 35 | 72 | 3 | 27 | -90% | -62% | 110% | 693% |
| C | **Collection and transportation costs** | | | | | | | | | |
| C1 | Material cost: | | | | | | | | | |
| | Fuel cost | RSD | 114,545 | 81,377 | 197,151 | 58,697 | 72% | -28% | -29% | -70% |
| | Lubricants | RSD | 29,752 | 21,137 | 51,208 | 15,246 | 72% | -28% | -29% | -70% |
| C2 | Labor: | | | | | | | | | |
| | Driver's wage | RSD | 38,909 | 37,095 | 40,315 | 7,798 | 4% | -79% | -5% | -81% |
| | Worker's wage | RSD | 36,484 | 34,784 | 37,802 | 7,312 | 4% | -79% | -5% | -81% |
| C3 | Other operation cost: | | | | | | | | | |
| | Highway fee | RSD | 0 | 0 | 33,800 | 5,200 | | | | |
| | Final Disposal cost | RSD | 6,023 | 6,689 | 24,724 | 33,359 | 311% | 399% | 11% | 35% |
| | | | | | | | | | | |
| C4 | **Total cost** | **RSD** | 225,713 | 181,082 | 385,000 | 127,612 | 71% | -30% | -20% | -67% |
| C5 | **Unit cost** | **RSD/ton** | 4,385 | 3,167 | 43,725 | 10,742 | 897% | 239% | -28% | -75% |

Note: SL's trips to the Sid DS and RLF are estimated based on the proportions of the corresponding trips conducted by CT (the CT trips: 24 trips to Sid DS and 4 trips to RLF)

- Change in the Sufficiency of Collection Service
  - **Data source:** Interviews with local residents of the target locations selected for Objective-2
  - Survey details:
    - **Date:** 24 Jan 2024
    - **Number of interviewees:** Telek-2, Gradina-3, Jezero Moharac-2, Molovin-6
    - Results

**Table 74 Changes in the Sufficiency of Collection Service (1)**

| Locations | Sufficiency of Collection Service | |
|---|---|---|
| | **Before PP** | **After PP** |
| Telek<br>(Winter: 10-15 residents<br>Summer: 100+ residents) | Number of containers: 1<br>Finding:<br>1 container was not sufficient during the summer, needing to put waste outside the container 4 or 5 days after collection<br>Occasionally, the waste was burnt onsite in summer.<br>Less residents in winter; 1 container is sufficient | Number of containers: 2<br>Finding:<br>No waste has been dumped near the container after the container was added.<br>During the PP period, the amount of waste was small due to the season.<br>2 containers will be sufficient during summer, the peak season.<br>(During the T&M survey conducted in Dec 2023, the containers were filled to less than half their capacity). |

**Table 75 Changes in the Sufficiency of Collection Service (2)**

| Locations | Sufficiency of Collection Service | |
|---|---|---|
| | **Before PP** | **After PP** |
| Molovin Commune (Population: 127; 2022 census) | Number of containers: 4<br>Finding:<br>4 containers were not sufficient for the entire commune<br>Many residents dumped their waste at the dumpsite located in the northwest of the settlement | Number of containers: 9<br>Finding:<br>Increasing the containers to 9 and placing them in more spots were significant improvement.<br>However, the 3 containers placed near the dumpsite have not been enough, and a few residents still throw their garbage at the dumpsite when these containers become full.<br>2 more containers are necessary at the spot near the dumpsite to eliminate the using of the dumpsite. |
| Gradina (Winter: appr. 100 residents Summer: appr. 500 residents) | Number of containers: 1<br>Finding:<br>1 container was not sufficient during the summer<br>In summer, 2 or 3 days after collection, the container became full, and residents put waste outside the container.<br>In winter, 1 container is enough on weekdays but not on the weekends. | Number of containers: 3<br>Finding:<br>No waste has been dumped near the container on the weekends after the increase in the number of containers.<br>3 containers will be sufficient even in summer when residents in the area increase.<br>New houses are being built in the area; containers may need to be increased in the near future.<br>(During the T&M survey conducted in Dec 2023, the containers were filled to half their capacity). |

**Table 76 Changes in the Sufficiency of Collection Service (3)**

| Locations | Sufficiency of Collection Service | |
|---|---|---|
| | Before PP | After PP |
| Jezero Moharac (Winter: 100 people/weekend Summer: 500 people/weekend) | Number of containers: 1<br>Finding:<br>1 container was not sufficient during the summer and on the weekends in the winter.<br>When the container became full, residents had to put their waste outside the container.<br>Some people carried their garbage to the dumpsite located near the Erdevik settlement. | Number of containers: 2<br>Finding:<br>No waste has been dumped near the container on the weekends after the increase in the number of containers.<br>2 containers have been sufficient in the winter.<br>During the peak season in summer, 2 containers will not be sufficient. 2 more containers need to be added. |

### 2) Findings

- Replacement of SL with CT
    1. When the destination changes from Sid DS to RLF, the efficiency of waste collection and transportation decreases drastically. This can be mitigated by replacing the SL with a CT, as demonstrated by the PP.
    2. Although cost increase is inevitable, replacing the SL with a CT significantly mitigates the expected cost increase.
- Improvement of the sufficiency of collection service
    3. Interview results revealed that collection service in the locations selected for Objective-2 improved through the PP. However, it was noted that an increase in the number of containers is needed in Molovin Commune.
    4. Nevertheless, the PP was implemented in December, the season when waste amount decreases at most target locations. To meet summer demands, additional containers are needed at certain spots (e.g., Jezero Moharac and possibly Gradina).

## 3 Review of the A/P

- Review of the A/P Collection Plans
    **1.** Waste from each GS in Sid Commune was re-estimated based on the combined results of the following surveys:

- WB survey conducted by PUC in 2020
- T&M survey conducted by JET in 2021
- T&M survey conducted during the PP in Dec 2023
- The WB data of the Sid RY and the RLF for Dec 2023

**2.** All GSs in Sid Commune was mapped.

**3.** Trip plans were revised based on the geographical locations of the GSs and the estimated waste from each source.

- Determining GSs and residential areas to be collected in the same day
- Determining the required number of trucks and truck capacities for each day
- Grouping GSs for each truck and each trip
- Preparing routes and schedules

**4.** Collection plans of RW and LW for Sid Commune were revised.

- RW:
  - ☐ Container collection plan for Blue Containers (completed)
  - ☐ Door-to-door collection plan for Blue Bins (under preparation)
- LW:
  - ☐ Container collection plan for public containers and non-HH GS (completed)
  - ☐ Door-to-door collection plan for detached houses and small businesses (completed)

## LESSONS LEARNT

- ✓ Conduct a WB survey to better estimate waste amounts from sources

  The weight of waste being collected by SLs varies greatly depending on the type of waste or the activities of the GSs. During the PP, it was revealed that the amounts of waste collected from the PP target locations were 2 to 3 times smaller than the amounts anticipated at the planning stage. **The amounts of waste being discharged by each target source should be determined through a WB survey at the planning stage.**

- ✓ Align truck capacity and waste collection amount

  The average waste transported in a single trip was 2,466 kg on average, which was too small for the CTs with capacities of 20 $m^3$ and 22 $m^3$. The mismatch between the truck capacity and the amount of collected waste resulted in a lost opportunity to increase the overall efficiency of the operation (the actual capacity utilization rate of the CTs was 39% to 46%, not much higher than the SL's 38%). **The capacity of the CT should match the amount of waste to be collected from target sources in a single trip.** This can be achieved by adjusting GSs to be covered in each trip.

- ✓ Optimize routes based on geographical proximity of sources

  During the PP, all the target locations, either in Sid Commune or other communes, were covered in a trip (Slide 19). The inclusion of sources/locations from several distant areas in a single trip impacted the overall efficiency of CT collection. **Geographical locations of sources/locations are crucial in planning trips.**

- ✓ Implement public awareness activities

  Despite the containers not being full, it was frequently observed that waste was discharged outside of the containers at some of the PP target locations. Consequently, **raising public awareness is important.**

## D PP 4: Proper Management of Green Waste (GW)

### 1 Plan of Pilot Project

### 1.1 Background

- GW is divided into Pruning Waste/Green Waste (PW/GW) and Other GW.
- The amount of GW generated in Sid City is 12.1 tons/day, accounting for **27.2%**, more than a quarter of the total generation amount of MSW.
- Because of the large volume of PW/GW, its proper management (collection, transportation, recycling and disposal) as it is requires a lot of inputs.
- Therefore, PUC planned to chip the PW/GW with a chipping machine in order to **reduce the management cost of the PW/GW**, by reducing the collection and transportation costs and recycling the chipped PW/GW as much as possible.
- The PP4 was implemented by the PUC with the support of the JET.

### 1.2 Objectives and Target Area

- Objectives:
  GW is properly managed.
- Target Area:
  Sid Commune

### 1.3 Activities

#### 1) Developing a proper management plan of the GW

- Studying the proper management (collection, transportation, recycling and disposal) methods
- Studying the usages of the chipped materials both from HHs and public area
- Developing the proper management plan of the GW
- Studying the proper management cost and the mechanism of the cost sharing
- Developing the operation plan of the chipping machine

#### 2) Implementation of the proper treatment method on pilot basis for verification.

- Procurement of a chipping machine
- Implementation of the proper treatment method

### 3) Review of the A/P regarding the proper management of GW

- ☐ Evaluation of the PP4
- ☐ Review of the A/P regarding the proper management of GW

## 1.4 Indicators & Necessary Inputs

- ☐ Indicators

• Amount (or number of trips) of GW properly treated

- ☐ Necessary Inputs

JET

• Procurement of a chipping machine

• Construction of a WB

PUC

• Provision of a towing vehicle for moving the chipping machine

• Use of the GW at the source (fuel, compost, mulching, etc.)

• Use of the chipped PW/GW mulching materials for public areas

• Temporary storage of the chipped PW/GW at the current DS for future field composting

# 2 Implementation of PP4

## 2.1 Developing a proper management plan of the GW

The GW is divided into **PW/GW** and **Other GW**.

### 1) Plan of PW/GW

**Table 77 Plan of management of PW/GW**

| Generation Source | Discharge Method | Service Fee | Transport Vehicle for Chipping Machine | Management of Chipped GW |
|---|---|---|---|---|
| Small Generators | Chipping service on Call. | Free | PUC provides the chipping service with chipping machine in front of generator. | Generator is promoted to use the chipped PW/GW at household.<br>If difficult, PUC takes it to the Sid disposal site for future use. |
| Large Generators | Chipping service on Call. | To be charged | PUC provides the chipping service with chipping machine in front of generator. | Generator is promoted to use the chipped PW/GW at household. |

| | | | | |
|---|---|---|---|---|
| | | | | If difficult, PUC takes it to the Sid disposal site for future use. |
| Any generators | Generators discharge PW/GW at RY | Free | Chipping at the RY by PUC | Pile up at the Sid disposal site. |
| Public Area | None | None | For annual pruning work, PUC provides the chipping machine. For other cases, only collection vehicle be provided. | Used for mulching in public area.<br>Piled up at the Sid disposal site. |

### 2) Plan of Other GW

- Other GW(GW other than PW/GW) means leaves and grass.
- The generator composts the other GW at the source or otherwise disposes of it as MW. Sid City/PUC will encourage composting at the source through public relations and awareness activities.
- When discharging waste because it cannot be composted at the source, it is recommended that it be disposed of together with PW/GW as much as possible. (then PUC brings it to RY)
- If the above method cannot be used, the generator discharges it together with MW.

### 3) Plan of GW

- Studying the proper management cost and the mechanism of the cost sharing
  - GW collection, transportation and disposal are included in the current waste collection fee as far as it is not excessively huge.
  - GW collection fee from large generator will be additionally charged in the future.
- Developing the operation plan of the chipping machine
  - Chipping service to citizens: depending on requests from citizens
  - Pruning work in public areas: as required

## 2.2 Implementation of the proper treatment method on pilot basis for verification

### 1) Procurement of a chipping machine

Points to consider when purchasing a chipping machine

- Maximum chipping diameter does not need to be more than 15cm

- There is no need to chip branches with diameters of 10cm or more as they can use be used as fuel for wood stoves.

☐ It must be able to be towed by a truck.

- In order to provide chipping services to citizens, we adopted a towed type rather than a stationary type.

☐ Chip size should be adjustable.

- The chip size can be selected according to the purpose by changing the chipping speed.

**Figure 67 Chipping Machine**

### 2) Implementation of the proper treatment method

☐ PW/GW

- Small Generators and Large Generator

  Chipping service by PUC (chipped PW/GW will be used by generators or brought back by PUC)

  Brought to RY by generators (then chipped by PUC)

- Public Area

  Chipped at the site

  Brought to RY by PUC (then chipped by PUC)

☐ Other GW: Home compost

### 3) Measurement of chipping material

Measurement of Chipped PW/GW has two ways.

- ☐ Volume measurement using a truck loading platform
  - Measure the size of the loading platform (width, length, height) and calculate the volume.
- ☐ Volume estimation based on chipping work time
  - When chipping work is carried out without trucks or large bags whose volume can be easily determined, volume is estimated based on the chipping work time.
  - Assuming normal chipping work (number of people, work speed, etc.), we actually performed chipping work and determined the work capacity per hour.
  - Chipping capacity per hour: $2m^3/h$ (volume after chipping)

**Table 78 Record of Chipped Work**

Capacity of chipping machine: 2 $m^3/h$

| No. | Date | Time | Place | | Working hours | Chipped volume m3 | Purpose of use | Place of storage |
|---|---|---|---|---|---|---|---|---|
| 1 | 2023.12.6. | 10:00 | Sveti Sava street | Šid | 30 min | $1m^3$ | Mulch | Ruski dvor |
| 2 | 2023.12.8. | 9:00 | Pinkijeva street | Šid | 30 min | $1.5m^3$ | Mulch | Ruski dvor |
| 3 | 2023.12.8. | 11:00 | Sport hall | Šid | 30 min | $1m^3$ | Mulch | Ruski dvor |
| 4 | 2023.12.13 | 8:00 | New sematary | Šid | 90 min | $4m^3$ | Mulch | Ruski dvor |
| 5 | 2023.12.25 | 9:00 | Aman | Šid | 60 min | $2.5m^3$ | Mulch | Ruski dvor |
| 6 | 2023.12.26 | 8:00 | New sematary | Šid | 90 min | $3m^3$ | Mulch | Ruski dvor |
| 7 | 2023.12.26 | 10:00 | New sematary | Šid | 90 min | $3m^3$ | Mulch | Ruski dvor |
| | Total | | | | 7 hours | $17m^3$ | | |

### 4) Developing information materials for the citizen to utilize Chipping service and use Home Composter.

- ☐ Discharge rule leaflet distributed to citizens in PP area

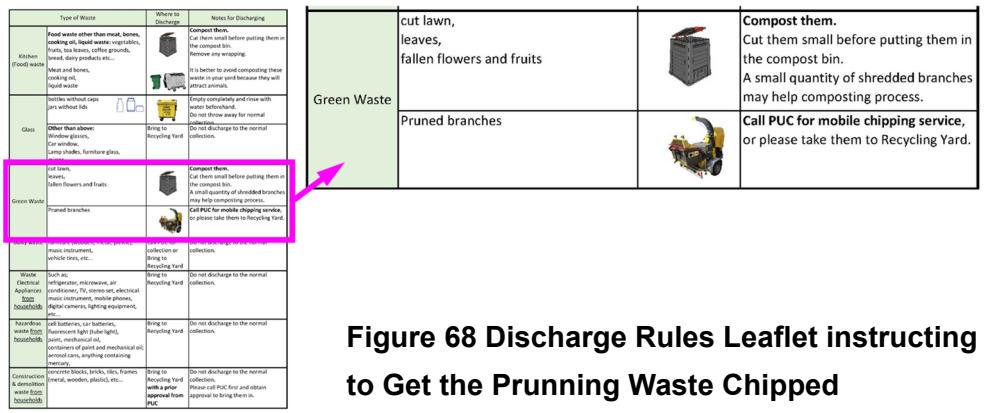



**Figure 68 Discharge Rules Leaflet instructing to Get the Prunning Waste Chipped**

- Compost manual distributed to citizens in PP area



**Figure 69 Manual for Home Composting and Notification of Chipping Service**

## 2.3 Actual Input

**Table 79 Actual Input**

| Item | | Cost | Remarks |
|---|---|---|---|
| Initial investment | Chipping machine | 36,460 € | |
| Manpower | Worker | 154 €/month | 10hr*4*450RSD/hr/117 |
| Fuel | Diesel | 47 €/month | 7hr*4*1.67 |

Note: Assuming that chipping work hours are 7 hours/December, number of workers for chipping work are 4 persons, fuel consumption: 4 litters/hr, and diesel cost is 1.67€/litter.

## 2.4 Evaluation of the PP4

### 1) Results of Activities

- Small Generator, Large Generator (Tipping service)

  There were no requests for chipping services from citizens during the PP period.

- Public Area

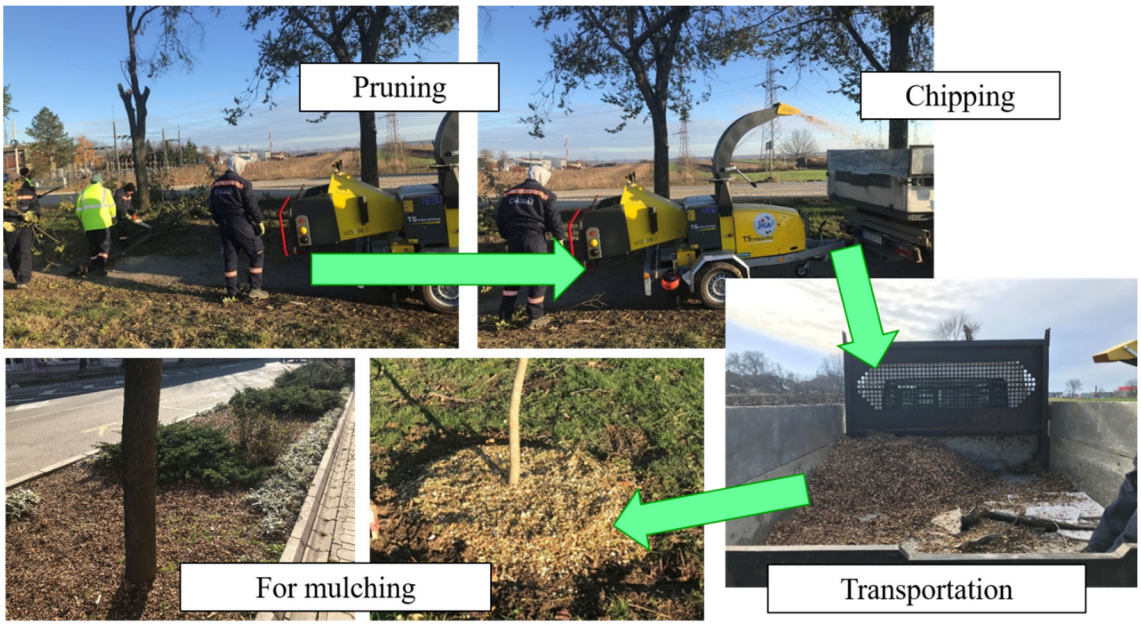



**Figure 70 Treatment Process of Prunning Waste**

☐ Other GW

Green waste other than pruning waste are encouraged to be composted at households.


**Figure 71 Composting of Green Waste at Households**

### 2) Significantly improved PW/GW transportation efficiency

#### a. Comparison by volume

Transport efficiency increased by 17 times by chipping the pruned branches.

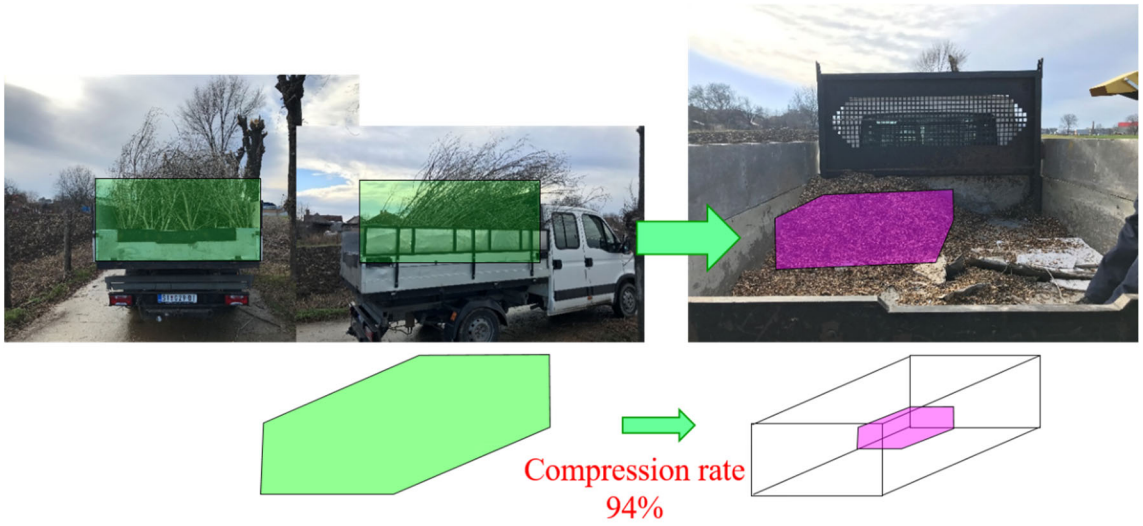



**Figure 72 Volumes of Prunning Waste before and after of Chipping Process**

**b. Comparison by weight**

Transport efficiency increased by 14 times as shown in Table 77.

**Table 80 Comparison between Branch and Chip Material**

| | Object | Weight(t) | Volume($m^3$) | Density($t/m^3$) |
|---|---|---|---|---|
| Case1 | Branch | 0.19 | 6.80 | 0.028 |
| Case2 | Chip material | 0.22 | 0.57 | 0.39 |

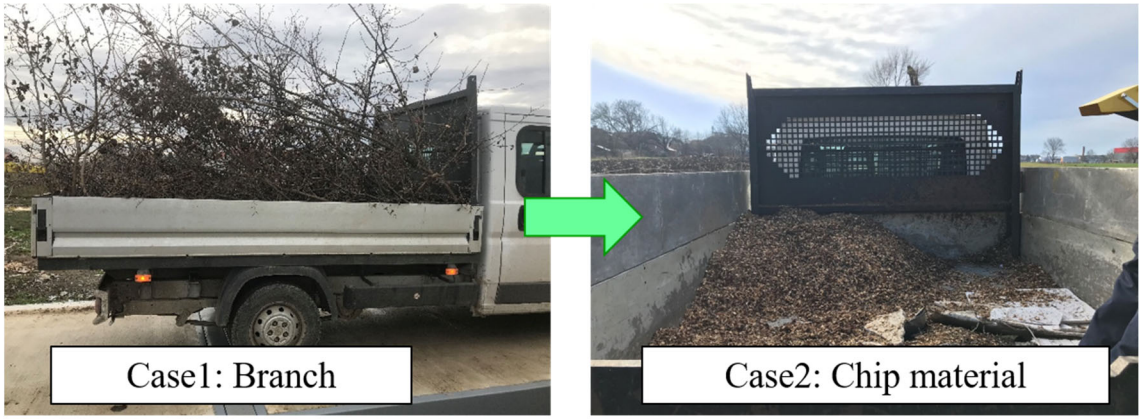



**Figure 73 Comparison between Branch and Chip Material**

**3) After chipping**

The several ways of using chipped materials can be considered as shown in the figure below.


**Figure 74 Various Uses of Chipped Material**

Note: Red texts are achievements.

### 4) Evaluation

☐ Good results

- Significant (14 to 17 times) transportation efficiency can be expected.
- Significant cost reductions are expected by improving transportation efficiency.
- Cost reductions can be expected by recycling chipped materials.

☐ Points to be improved

- There were no requests for chipping services from citizens during the PP period. This seems to be because December, when PP was implemented, was a time when there were few PW/GW.
- On the other hand, it will take time to disseminate the chipping service to citizens. It is necessary to continue PR activities.

## 3 Review of the A/P

### 3.1 Review of the A/P regarding the proper management of GW

There is no need to change A/P through PP activities and the management of pruning waste will be conducted as indicated in Table 74.

LESSONS LEARNT

- ✓ Transporting PW/GW is inefficient, but it is possible to **increase transport efficiency by 14 to 17 times** by reducing the volume with a chipping machine.
- ✓ **Disposal costs can be reduced** by reusing chipped material as mulching material or fuel material, or by composting it.
- ✓ **Sufficient PR is required** when providing chipping services to citizens.

# E PP5: Optimal Management of Recycling Yard (RY)

## 1 Plan of Pilot Project

### 1.1 Background

The Srem-Macva RWMC do not accept waste such as glass (recyclable and non-recyclable), bulky waste, PW and hazardous waste, which we call "Specific Waste" (SW). In order to properly manage the SW, it is the municipalities' obligation to construct at least one Waste Collection Center, or Recycling Yard (RY), according to "Waste Management Program of The Republic of Serbia for The Period 2022-2031. Therefore PUC planned to construct a RY within the adjoining area of the DS of Sid. The optimal management of the RY is one of the most important issues in the implementation of the A/P. The PP5, therefore, were conducted by the PUC with the support of the JET.

**Figure 75 An Example of Recycling Yard in Sremska Mitrovica**

### 1.2 Objectives and Target

- Objectives

  Verify the management method of the SWs not being accepted by the RWMC.

- Target RY

  RY to be constructed next to the DS of Sid.

- Target Waste

  Not only SW but also some non-SW are accepted for better management.

**Table 81 Waste Types to be Collected at RY**

| SW | Non-SW |
|---|---|
| Bulky waste<br>WEEE<br>HMW<br>Construction & Demolition waste<br>Glass other than recyclables<br>Recyclable glass collected in yellow containers (to be transferred to 5m3 container)<br>PW | PET bottles, paper and cardboard from large generators |

## 1.3 Activities

### 1) Construction of the RY

- Planning and designing of the RY
- Construction of the RY and installation of the equipment for the RY
- Construction of the WB
- Developing an operation manual for the WB
- Studying the required treatment for respective SWs
- Identifying appropriate waste dealers and/or recyclers for respective SWs
- Developing the optimal operation plan of the RY
- Examining necessary regulation and/or rules to be imposed on users
- Examining a feasible and sustainable budgetary plan (selling prices, collection and treatment fees, etc.)

### 2) Management of the RY

- Operating the RY
- Developing information materials for the citizen to utilize RY

### 3) Review of the A/P regarding installation and operation of the RY

- Evaluation of the PP5
- Review of the A/P regarding installation of the RY

## 1.4 Indicators & Necessary Inputs

- Indicators
  - Operation plan of the RY

- Operation manual for the WB
- At least one (1) kind of recycling dealers who will collect the SW is found

☐ Necessary Inputs

➢ JET

- Construction of the WB

➢ PUC

- Construction of the RY
- Installation of the equipment necessary for operation of the RY
- Provision of Utility Supply (electricity*, water*, septic tank) to the WB & RY

(*) to be provided by PUC in cooperation with Sid municipality

## 2 Implementation of PP5

### 2.1 Construction of the RY

☐ **Plan of RY**

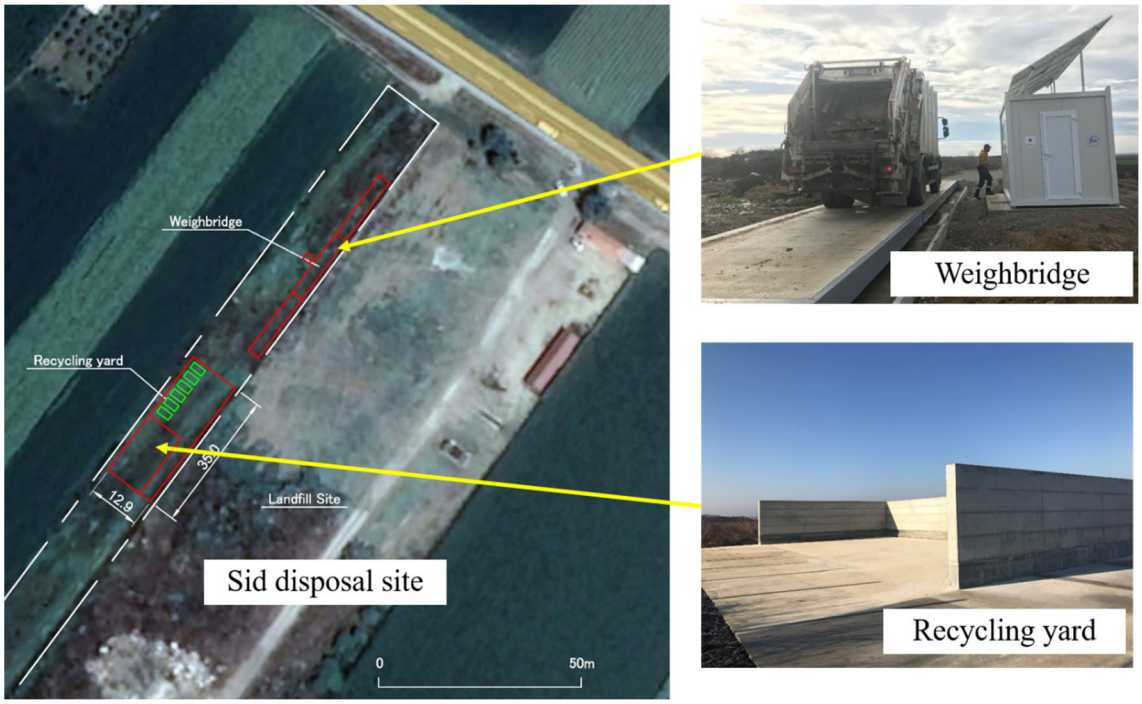



**Figure 76 Layout of the Planned RY in Sid**

### 1) Construction of the RY and installation of the equipment for the RY

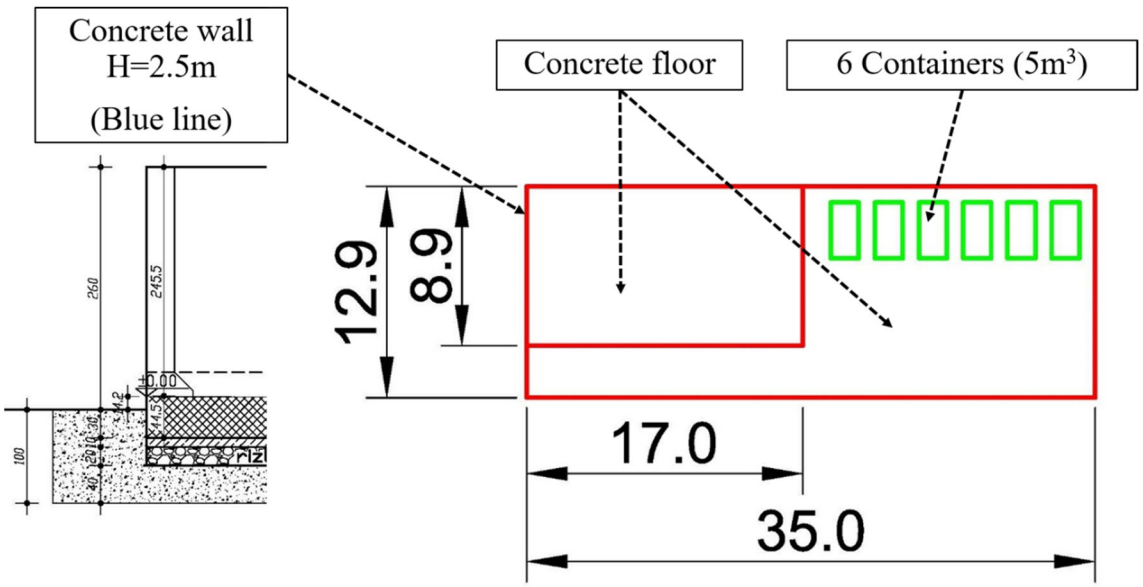



**Figure 77 Plan View of RY**

PUC uses CTs to collect recyclable glass in yellow containers. It is not possible to discharge it from the CT to 5m$^3$ container of RY directly. Therefore this area is used to discharge recyclable glass from the CT and reload it to 5m$^3$ container of RY by a small wheel loader.

6 containers are installed for:

1. Recyclable glass
2. Glass other than recyclables
3. Bulky waste
4. WEEE
5. PET bottle
6. Paper/Card board

Although PET bottle and Paper/Card board are not SW, containers for these waste were installed in RY to meet the demand from large generators.

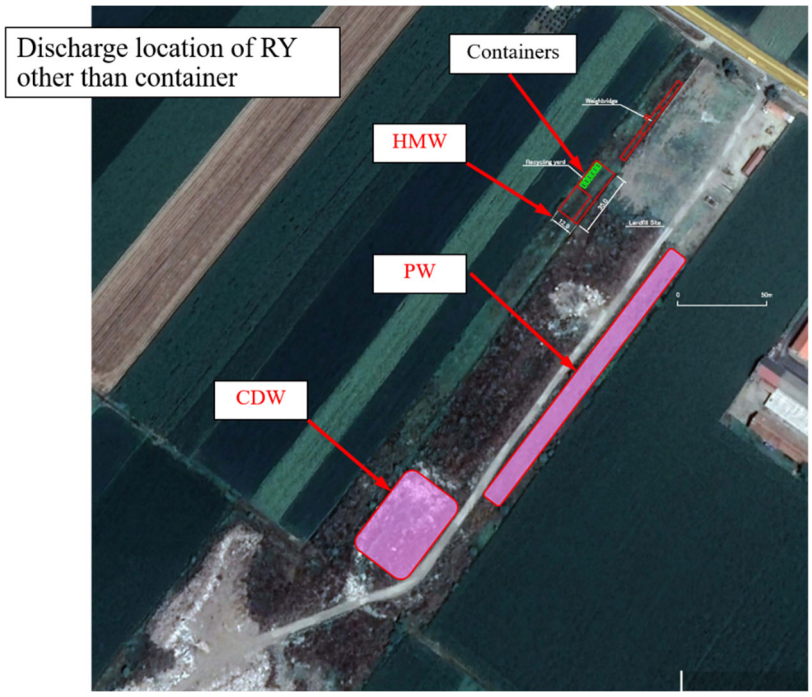



**Figure 78 Locations within RY for Different "Specific Wastes"**

**Figure 79 RY under Construction**

**Figure 80 Constructed Weighbridge and its Contorol House**

### 2) Developing an operation manual for the WB

- Procedures for all collection trucks (PUC, others) and citizens to bring waste to the Sid DS/RY

1) All collection trucks (PUC and others) and citizens will receive an explanation from the PUC DS staff at the security house of the DS in Sid that "measurement using WB is required before and after dumping waste'".

*Once the driver received the instructions, this step will be skipped the next time.

2) The weight of the target vehicle (vehicle + waste) should be measured by WB before dumping.

3) The waste is dumped at the DS or RY.

4) The weight of the target vehicle after dumping waste should be measured using the WB again.

5) WB staff issues a document which is written the measured weight to the driver of the target vehicle.


**Figure 81 Operators of WB**

**Table 82 Input Items to Operation Program of WB**

| Item | Detail |
|---|---|
| 1. Basic information | Date, Time, |
| 2. Vehicle information | Number plate<br>Driver name |
| 3. Who bring in | PUC<br>Other municipality (name is required)<br>Citizen<br>PC (when measuring, it is required to record the company name) |
| 4. From where | 19 commune name<br>PC (by SL) |
| 5. Waste category | Recyclable waste (Blue container and blue bin)<br>Recyclable glass (Yellow container and yellow bin)<br>LW (Metal container, green bin and 5m$^3$ container by SL)<br>GW<br>Non-recyclable glass<br>Bulky waste<br>WEEE<br>HMW<br>C&D waste<br>Mix of WEEE and Bulky waste<br>Other waste |

**Table 83 Measuring Plan of Waste using WB**

| | **Bring-in** | | | **Bring-out** | |
|---|---|---|---|---|---|
| Waste category | PUC truck | Other municipalities | Citizen/ Private companies | To RWMC | Recycling companies |
| LW (Metal container, green bin and 5m3 container by skip loader) | ✓ | ✓ | | ✓ | |
| RW (Blue container and blue bin) | ✓ | | | ✓ | |
| Recyclable glass (Yellow container and yellow bin) | ✓ | | ✓ | | ✓ |
| Pruning waste | ✓ | | ✓ | | |
| Non-recyclable glass | ✓ | | ✓ | | ✓ |

| | Bring-in | | | Bring-out | |
|---|---|---|---|---|---|
| Bulky waste | ✓ | | ✓ | | ✓ |
| WEEE | ✓ | | ✓ | | ✓ |
| HMW | | | ✓ | | |
| C&D waste | ✓ | | ✓ | | |
| Mix of WEEE and Bulky waste | ✓ | | ✓ | | ✓ |
| Paper | | | ✓ | | ✓ |
| PET bottle | | | ✓ | | ✓ |

LW and RW on the top of the table are not the target waste of RY, but they are also measured

Note: Landfill waste and recyclable waste are basically brought to RWMC, but since it was not possible to bring all of these wastes to RWMC during the PP period, they were accepted temporarily.

### 3) Studying the required treatment for respective SW

**Table 84 SW Treatment Plan**

| SW Type | Discharge | Recycle / Treatment | Final Disposal |
|---|---|---|---|
| 9. Recyclable Glass | Yellow Container to RY | PC | No (Recycled) |
| 9. Glass other than recyclables | Container at RY | PC | No (Treated) |
| 10. PW/GW | For Recycling | Chipping for Recycling | No (Recycled) |
| 11. Bulky Waste | Collection or RY | Dismantled at RY | No (Recycled)<br>Residues at RLF |
| 12. WEEE | Collection or RY | PC | No (Treated) |
| 13. HMW | RY | PC | No (Treated) |
| 14. C&D Waste | Collection or RY | No | Sid DS |

**4) Identifying appropriate waste dealers and/or recyclers for respective SW**

**Table 85 Dealers and Recyclers for Each Type of Waste**

| No. | Target waste | Dealers/Recyclers | Situation |
|---|---|---|---|
| 1 | Recyclable Glass | Kappa Star | Contracted with Kappa Star |
| 2 | Other glasses than recyclables | | No negotiation |
| 3 | Bulky Waste | After being dismantled by PUC, it will be separated into each recyclables. | |
| 4 | WEEE | Recycler in Sremska Mitrovica | A contract is expected to be concluded after seeing the quantity, quality, and content of WEEE collected in RY. |
| 5 | Paper/Cardboard | Kappa Star | Contracted |
| 6 | PET | Kappa Star | Contracted |

**5) Developing the optimal operation plan of the RY**

**Table 86 Operation Plan of the RY**

| Waste Type | | Discharge | Remarks |
|---|---|---|---|
| SW | 9. Recyclable Glass | Container in RY | Discharge the recyclable glass from yellow containers collected by PUC. |
| | 9. Other glasses than recyclables | Container in RY | Discharge by citizens and PUC. |
| | 10. PW/GW | Specific location in RY | Discharge by citizens and PUC.<br>Then chipping by PUC. |
| | 11. Bulky Waste | Container in RY | Discharge by citizens and PUC.<br>After dismantling by PUC, separated to each recyclable waste. |
| | 12. WEEE | Container in RY | Discharge by citizens and PUC. |
| | 13. HMW | Specific location in RY | Discharge by citizens and PUC. |
| | 14. C&D Waste | Specific location in RY | Discharge by citizens and PUC. |
| RW | 1. Paper & Cardboard | Container in RY | Discharge by large generator. |
| | 2. Plastic (PET) | Container in RY | Discharge by large generator. |

- Operation plan of the RY

- Signboards indicating the target waste are placed in each container.
- All dischargers to RY are required measuring by using WB before and after dumping waste.
- When Dealers and/or Recyclers take recyclables out of RY, they must measure them at WB before and after taking them out.

☐ PUC organizational structure

- Along with the construction of RY and WB, PUC established “Recycling Work Unit" responsible for the operation of RY and WB.

### 6) Examining necessary regulation and/or rules to be imposed on PUC and users

**Table 87 Examining Necessary Regulation and/or Rules to be Imposed on PUC and Users**

| Rules | Description |
|---|---|
| PUC can/shall decide buyers of the valuable waste that are accumulated in RY. | Recyclable/non-recyclable glass, PET bottles, Paper, WEEEs. |
| PUC shall disassemble bulky waste discharged to RY and separate them according to the type so recyclable waste. | Separated valuable shall be discharged to the applicable containers in RY. |
| PUC shall store the HMW in containers with lid. | Further management should be in line with relevant laws and regulations.(National WM Program states that there will be a regional system to treat HMW.) |
| PUC shall reuse the PW/GW collected to RY as much as possible by chipping with the chipping machine. | Mulching in public areas, composting (in the compost plant to be developed in future.) |

### 7) Examining of feasible and sustainable budgetary plan

☐ Sale price

PUC can use the proceeds from the sale of valuables for waste management. The sale price varies depending on the quality, quantity, and market of the target waste.

**Table 88 Sale Price for Each Type of Waste**

| No. | Target waste | Dealers/Recyclers | Sale price |
|---|---|---|---|
| 1 | Recyclable Glass | Kappa Star | 5 RSD/kg |
| 2 | Other glasses than recyclables | | |
| 3 | Bulky Waste | - | |
| 4 | WEEE | Under negotiation | 10 RSD/kg |
| 5 | Paper/Cardboard | Kappa Star | Paper: 5 RSD/kg<br>Paper/Cardboard: 2.5 RSD/kg |
| 6 | PET | Kappa Star | 8 RSD/kg |

## 2.2 Management of the RY

### 1) Operating the RY

☐ Operational situation of RY implemented in PP

Since the construction of the RY was not completed, the temporary RY was set up and operated.

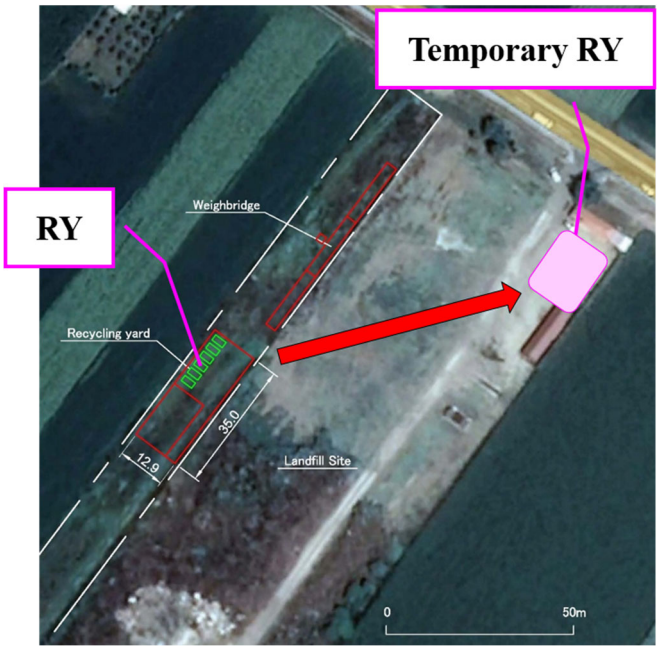



**Figure 82 Location of Temporaty RY**

**Figure 83 Temporary RY**

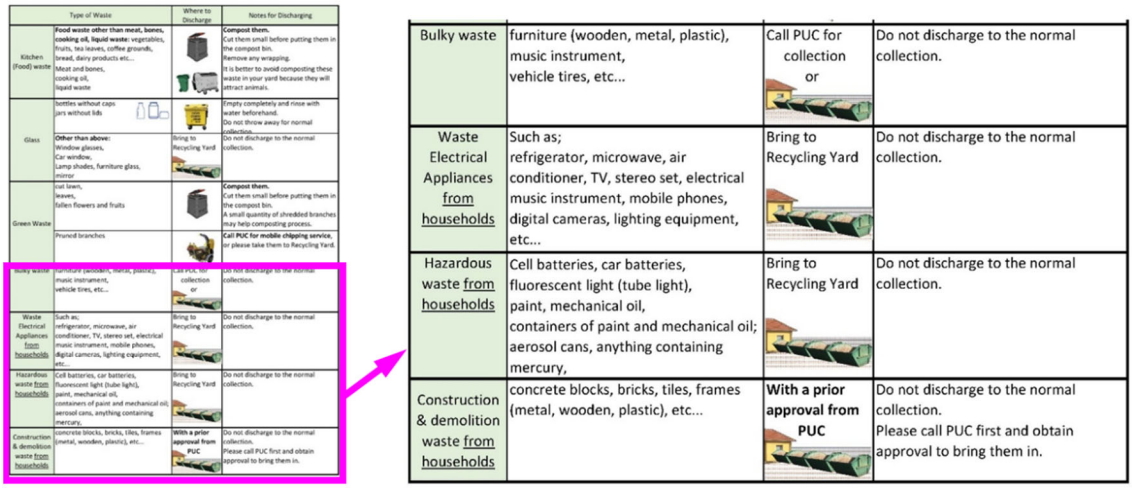
**Table 89 Operational Situation in PP**

| SW Type | | Discharge | Operational situation in PP |
|---|---|---|---|
| SW | 9. Recyclable Glass | Container in RY | It was regularly collected by PUC and discharged to RY. |
| | 9. Other glasses than recyclables | Container in RY | Almost none was discharged. |
| | 10. PW/GW | Specific location in RY | Many GWs were brought in by PUC. |
| | 11. Bulky Waste | Container in RY | Almost none was discharged. |
| | 12. WEEE | Container in RY | It was not discharged. |
| | 13. HMW | Specific location in RY | It was not discharged. |
| | 14. C&D Waste | Specific location in RY | Almost none was discharged. |
| RW | 1. Paper & Cardboard | Container in RY | It was not discharged by large generator. |
| | 2. Plastic (PET) | Container in RY | It was not discharged by large generator. |

### 2) Developing information materials for the citizen to utilize RY

- Leaflets

Leaflets were distributed to citizens in PP area to encourage them to bring SW to RY.



| | | | |
|---|---|---|---|
| Bulky waste | furniture (wooden, metal, plastic), music instrument, vehicle tires, etc... | Call PUC for collection or | Do not discharge to the normal collection. |
| Waste Electrical Appliances from households | Such as; refrigerator, microwave, air conditioner, TV, stereo set, electrical music instrument, mobile phones, digital cameras, lighting equipment, etc... | Bring to Recycling Yard | Do not discharge to the normal collection. |
| Hazardous waste from households | Cell batteries, car batteries, fluorescent light (tube light), paint, mechanical oil, containers of paint and mechanical oil; aerosol cans, anything containing mercury, | Bring to Recycling Yard | Do not discharge to the normal collection. |
| Construction & demolition waste from households | concrete blocks, bricks, tiles, frames (metal, wooden, plastic), etc... | **With a prior approval from PUC** | Do not discharge to the normal collection. Please call PUC first and obtain approval to bring them in. |

**Figure 84 Insturctions to Discharge SW to RY indicated in the Leaflet**

- PR video

JET and PUC created a PR video, and have been publicized through the media and the PUC's website.

## 2.3 Actual Input

**Table 90 Actual Input to WB**

| Item | | Cost | Remarks |
|---|---|---|---|
| Initial investment | Construction of RY | 9,800,000 RSD | |
| | Construction of WB | 28,000 € | Including control house, excluding electricity, water and septic tank |
| Manpower | Worker | 72,000 RSD/month | 8hr*1*20days*450RSD/hr |

Note: Assuming that recording work hours for WB are 8 hours/day and number of workers for WB is 1 person.

## 2.4 Evaluation of the PP5

### 1) Results of Activities

- RY construction work by Sid municipality could not be completed in time, so the temporary RY was used during the PP period.
- Only Recyclable Glass and PW/GW collected by PUC were discharged to RY.

- Almost none was discharged by citizens.
- Bulky waste and WEEE were most expected to be brought in by citizens but none of them was brought to RY. This seems to be because that December, the PP period, was a time of year when there was little of this type of waste.

**Figure 85 Recyclable Glass in RY**

### 2) Evaluation

- Good results
  - The dealers and/or recyclers that will take over the SW have almost been decided.
  - WB operator and DS staff understood how WB and RY should be operated, appropriately guided all waste brought into the DS and RY, and measured all waste using WB.
- Points to be improved
- It will take time to disseminate SW discharge rules to citizens. It is necessary to continue PR activities.

## 3 Review of the A/P

There is no need to change the plan of management of A/P according to the PP activities, as shown in the tables in the following pages.

- Glass Waste

| Type of Waste | Point of Collection | Type of Container | Collection Frequency | Collection Provider (Vehicle) & Destination | Treatment & Final Disposal |
|---|---|---|---|---|---|
| Recyclable Glass | RI | 1.1m3 Yellow Container | Depending on necessity | PUC (20 m3 CT) to RY nearby Sid Landfill | - |
| | RY nearby Sid DS | Container provided by Private Company (PC) | Depending on necessity | PC to its Recycling Factory (To be discussed with the PC) | Recycling Factory of the PC |
| Non-Recyclable Glass | RY | 5m3 container | Depending on necessity | PC to its premises (To be discussed with the PC) | Treatment Factory of the PC |

- PW/GW

| Generation Source | Discharge Method | Service Fee | Transport Vehicle for Chipping Machine | Management of Chipped GW |
|---|---|---|---|---|
| Small Generators | Chipping service on Call. | Free | PUC provides the chipping service with chipping machine in front of generator. | Generator is promoted to use the chipped PW/GW at household. If difficult, PUC takes it to the Sid DS for future use. |
| Large Generators | Chipping service on Call. | To be charged | PUC provides the chipping service with chipping machine in front of generator. | Generator is promoted to use the chipped PW/GW at household. If difficult, PUC takes it to the Sid DS for future use. |
| Any generators | Generators discharge PW/GW at RY | Free | Chipping at the RY by PUC | Piled up at the Sid DS. |
| Public Area | None | None | For annual pruning work, PUC provides the chipping machine. For other cases, only collection vehicle be provided. | Used for mulching in public area. Piled up at the Sid DS. |

- Bulky Waste

| Discharge and Collection Method | Service Fee | Collection Frequency | Collection and Transport Vehicle | Treatment and Disposal |
|---|---|---|---|---|
| Door to Door collection by PUC on call | Free at preset but future be charged | Once a month | Tractor with trailer or Truck | Segregation at RY and Residues to the RLF |
| Generator discharges Bulky Waste into a Large Container installed at RY | Free | Not necessary | Not necessary | Segregation at RY and Residues to the RLF |

- WEEE, HWM and C&D Waste

| Type of Waste | Discharge Method | Type of Container | Service Fee | Collection and Transport Vehicle | Treatment and Disposal |
|---|---|---|---|---|---|
| WEEE | Recycling Yard (RY) | PUC or a private company to place containers | Free | From RY to treatment: Private company (PC) | Private company |
| | On-call collection by PUC (for residents who cannot transport WEEE to RY by themselves) | Not necessary | Free | From generator to RY: PUC<br>From RY to treatment: PC | Private company |
| HMW | Recycling Yard (RY) | PUC or a private company to place a special container | Free | Private company to transport from RY for treatment | Private company |
| C& D Waste | Small Generator (Not Construction Company): On-call collection by PUC | By request, PUC to provide 5m3 containers | To be Charged | PUC to provide a tipper or a skip loader | Sid DS |
| | Large Generator (Construction Company): PUC may provide 5m3 Container by the request | By request, PUC to provide 5m3 containers | To be Charged | Essentially, it is the generators' responsibility to transport the waste themselves. | Sid DS |

## LESSONS LEARNT

- ✓ It is important to find dealers and/or recyclers for recyclables.
- ✓ By having citizens bring SW to RY, collection and transportation costs can be reduced.
- ✓ By measuring the amount of waste collected at WB and the amount of waste sold to the dealers and/or recyclers, it is possible to implement quantitative waste management.
- ✓ Sufficient and continuous PR activities (through leaflet distribution and media, etc) are required to let the citizens know about the use of RY.

# Planning of Institutional System

## 1 Institutional System Plan

- The municipal solid waste management system consists of technical and institutional systems. In order to operationalize the Technical System planned in the A/P, **the Institutional System Plan was prepared with the following components:**
  1. **Plan of Rules and Regulations:** Municipal regulations and PUC rules required to execute the activities planned in the A/P and to utilize equipment and facilities properly (ex. Procedures to replace the large containers which private companies have to 1.1$m^3$ containers; rules of waste separation and discharge; etc.)
  2. **Organizational Plan:** For executing the A/P, adding personnel and/or strengthening the sections handling the awareness activities (information dissemination, education, publicity meetings, etc.), and the mobilization of newly procured equipment (Chipping Machine, CT) and facilities (RY, WB).
  3. **Financial Plan:** Financial allocations to manage the above-mentioned activities, equipment and facilities, in addition to the increased cost of collection, transportation, treatment and disposal.

## 2 Plan of Rules and Regulations

### 2.1 Amendment of Current Ordinance on Communal Hygiene and Services and General Provisions

Stipulations on the following matters need to be included:

1. The municipality and/or the PUC shall determine a waste discharge rule, which specifies the waste types to be separately discharged by waste generators, taking account of the National Waste Management Program, requirement of the RMRF, and other factors.
2. The municipality and/or the PUC shall widely announce the waste discharge rule mentioned above.
3. The waste generators shall observe the waste discharge rule.
4. When the rule stated in Paragraph 1 is modified, the municipality and/or PUC shall notify the changes fully to the waste generators in advance.

The waste discharge rule was developed by Pilot Project 1.

## 2.2 Development of a Rule Related to SL Collection

### 1) Objective:

To standardize waste management practices, enhance efficiency in waste collection and transportation, and ensure environmental compliance across the city.

### 2) Regulatory Content:

**a. Container Standardization:**

- Mandating replacement of large containers (with size of more than 5 $m^3$) placed at non-household generation sources with 1.1 $m^3$ containers
- The municipality/PUC will replace the containers being used by public entities and public areas
- Private entities are obliged to bear the container replacement costs by themselves

**b. Exemption:**

- Entities discharging waste not suitable for 1.1 $m^3$ containers are allowed to continue using large containers
- PUC will determine the entities to be exempted by determining the state and dimensions of the waste being generated by them.

**c. Compliance Period:**

- A deadline will be set for private entities to replace their large containers

**d. Penalties for Non-Compliance:**

- To be set

**e. Public Awareness:**

- Implementing awareness activities to inform non-household generation sources about the regulations and the importance of the container replacement.

## 2.3 Development of a Rule for Green Waste:

- Green Waste shall be treated at waste generation sources by composting (non-pruning green waste) and chipping with the service provided by PUC (pruning waste). The chipping service will be offered free of charge if the machine operation time required for chipping the waste is less than one hour. Otherwise, a fee of RSD 3,000 will be charged to the generator.

## 2.4 Development of a Rule for the Operation of RY

- "Specific Waste" (Bulky waste, WEEE, HMW from households, C&D waste from households, and non-recyclable glass and metal waste) shall be brought into the Recycling Yard (RY) by the citizens. Waste that is sorted prior to drop-off will be accepted free of charge at the RY; unsorted waste will incur fees. PUC will determine a table of fees.
- The citizens, business persons, and PUC shall weigh their waste with the weighbridge when they discharge their waste to RY.
- When any valuable waste is brought out from RY, the weight of the valuable waste shall be measured with the weighbridge.

## 2.5 Development of a Rule for the Promotion of Home Composting at Generation Source

- Waste generators who generate biodegradable waste shall try to reduce its discharge by composting as much as possible.
- PUC shall encourage composting at generation sources and distribute efficient composting methodologies to the waste generators.
- If a citizen is provided with a compost bin by PUC, the PUC shall conduct monitoring of its usage, and the user citizen shall report back to PUC during the first six (6) months of usage.
- If the user citizen decides to stop the use of the compost bin, he/she has to report this to PUC and return the bin to PUC.

# 3 Organizational Plan

- **Establishment of Recycling Work Unit within PUC:**

1. **Staff members:** 5 (to be assigned from the existing units)
   - Unit head (1)
   - Weighbridge operator (1)
   - Truck driver (1)
   - Workers (2)
2. **Tasks:**
   - Operate and maintain the RY and the weighbridge
   - Handle sorting, processing and sale of recyclable materials received at the RY

- Implement quality control measures to ensure that the recyclable materials meet the required standards
- Build and maintain relationships with buyers including manufacturers, recycling companies, and other stakeholders.
- Engage in negotiations to secure favorable terms and prices for the sale of recyclable materials.
- Manage data and metrics to monitor progress
- Raise community awareness about the RY activities and services

# 4 Financial Plan

## 4.1 Funds Required

**Table 91 Estimated Cost for WM in 2024 (Unit: Thousand RSD)**

| No | Indicators | Collection & Transport | Sid Disposal Site | Recycling Yard | PW Chipping Service | Promotion of home composting | Awareness Raising Activities | Total |
|---|---|---|---|---|---|---|---|---|
| 1 | Labor cost: | | | | | | | |
| | Driver | 3,562 | | | | | | 3,562 |
| | Operator (weighbridge, wheel loader) | | 71 | 941 | | | | 1,012 |
| | Worker | 6,680 | 883 | 397 | 663 | | | 8,623 |
| | **Subtotal** | **10,242** | **953** | **1,338** | **663** | **0** | **0** | **13,197** |
| 2 | Material costs: | | | | | | | 0 |
| | Fuel and lubricants | 20,911 | 723 | | 506 | | | 22,140 |
| | Composters | | | | | 193 | | 193 |
| | Manuals, leaflets and PR materials | | | | | 135 | 216 | 351 |
| | Work consumables | 1,167 | 23 | 46 | 77 | | | 1,313 |
| | **Subtotal** | **22,078** | **747** | **46** | **583** | **328** | **216** | **23,998** |
| 3 | Highway fee | 1,973 | | | | | | 1,973 |
| 4 | Tipping fee | 18,112 | | | | | | 18,112 |

| No | Indicators | Collection & Transport | Sid Disposal Site | Recycling Yard | PW Chipping Service | Promotion of home composting | Awareness Raising Activities | Total |
|---|---|---|---|---|---|---|---|---|
| 5 | Maintenance cost | 2,198 | 29 | | 238 | | | 2,465 |
| 6 | Depreciation cost | 2,094 | 26 | 436 | 213 | | | 2,769 |
| 7 | Expenses for organizing PR events and activities | | | | | | 221 | 221 |
| 8 | Other costs: | | | | | | | 0 |
| | Employee insurance | 21 | 1 | 2 | 3 | | | 27 |
| | Vehicle/equipment insurance | 170 | 24 | | 24 | | | 219 |
| | Annual technical inspection | 56 | 8 | | | | | 64 |
| | Vehicle/equipment registration fee | 21 | 3 | | 3 | | | 27 |
| | **Subtotal** | **268** | **36** | **2** | **30** | **0** | **0** | **337** |
| | **Grand total** | **56,965** | **1,791** | **1,823** | **1,728** | **328** | **437** | **63,071** |

Note:

(1) Volume of work (Waste to treat etc.): Based on the Waste Flow developed for the A/P

(2) For Estimating costs: (a) Collection and Transportation: The inputs (manpower, trucks and materials) and the operation indicators (the number of trips to RMRF and Sid DS/RY, kilometrage, operation hours) applied to the estimation were determined based on the collection and transportation plans prepared under the A/P. (b) Sid DS, RY, and PW Chipping Service: The operation indicators (operation hours of facility or equipment, treating capacity, fuel consumption, etc.) and required inputs (manpower, equipment, and materials) were set based on either the results obtained through the PPs or the PUC's current operation.

(3) Prices/Unit costs were set based on market prices, the PUC's financial reports, and the results of interviews with PUC.

## 4.2 Comparison between 2022 and 2024

1. **WM Cost in 2022 (Actual)**
   - **Entire Municipality:** **72,824 Ths. RSD** (PUC Financial Report)

- **Sid Commune:** **44,582 Ths. RSD** (based on the share of waste collected in Sid Commune, 60% of the total waste collected in the municipality)

2. **WM Cost for 2024 (Plan)**
   - **Sid Commune:** **63,071 Ths. RSD**
3. **Difference**
   - **Increase by 41%:** **18,489 Ths. RSD**

### 4.3 Revenues and Expenses of PUC for 2024

**Table 92 Revenues and Expenses of PUC for 2024**

| No | Category | Amount (Thousands RSD) | Remark |
|---|---|---|---|
| 1 | Expected Total Revenue | 198,520 | Amount invoiced for all services provided by PUC in 2022 was adopted |
| 2 | Expected Total Cost | 223,174 | Costs in 2022 + the additional costs for implementing the A/P (204,685 Ths. RSD + 18,489 Ths. RSD) |
| 3 | **Balance** | **-24,654** | |

### 4.4 Measures to be Taken

☐ **Actions to respond to the expected funding shortage:**

1. **Actions related to the revenue:**
   - Ensure a high collection rate of waste collection fee
   - Explore private companies interested in buying recyclable waste received at the Recycling Yard to increase revenues and reduce the amount of waste to be transported to the RWMC
   - Review (renew) the current fees of the services to be provided to non-household sources (collection fee, pruning waste chipping fee, etc.)
   - Explore the possibility of selling chipped pruning waste
2. **Actions related to the expenses:**
   - Promote recycling at generation sources (e.g. home composting, etc.) to reduce collection and transportation costs

- Explore the possibility to replace large containers (>5$m^3$) used at non-household sources with small containers (1$m^3$) in order to change SL collection to CT collection and to increase collection and transportation efficiency.

# Plan for Dissemination of Sid Model

## 1 Overall Goal

The Overall Goal has been set to be achieved in three years or so after the completion of the Project, in the continuous efforts by the Project implementing institutions on Serbian side.

**Table 93 Overall Goal and Indicators**

| Overall Goal | Objectively Verifiable Indicators |
|---|---|
| The Sid Model is disseminated to other small and medium-sized municipalities to promote regional waste management systems. | Sid Model will be introduced to 25 municipalities |

## 2 Plan of Operation and Implementation Structure to achieve Overall Goal

MEP plans to introduce Sid Model in seminars and/or workshops organized for any other donor projects, where small- and medium-sized municipalities will participate. The Project's counterparts from the PUC Standard Sid and the municipality of Sid are expected to explain about Sid Model in such occasions.

On the other hand, the Sid Model is the model developed based on the Project's experiences merely in Sid. However, the situation of waste management of small and medium-sized municipalities in Serbia vary from one municipality to another and there must be municipalities that the Sid Model cannot be applied straightforwardly. It is recommended the variety of waste management condition of different municipalities to be considered and the applicability of the Sid Model in each case to be assessed.

## 3 Monitoring Plan from the end of the Project to Ex-post Evaluation

MEP will be responsible for monitoring after the Project's completion in May 2024. MEP will keep the records in regard to the following:

- The plan to organize the seminars/workshops (date, venue, size of audience)
- The implementation record of the seminars/workshops (date, venue, list of municipalities attended and their responses)
- The activities to adopt the Sid Model by the municipalities that took part in the seminars/workshops
- PUC Standard will also keep records of inquiries made directly to them by other municipalities, and will communicate them to MEP.

# 1 Reviews on Laws and Regulations

## 1.1 List of laws and regulations reviewed

| Activity | No | Document name (ENG) |
|---|---|---|
| **B.1.1** | 1 | Strategic development plan of the Municipality of SID for the period 2016-2021 |
| **B.1.1** | 2 | National waste management strategy for period 2010-2019 |
| **B.1.1** | 3 | Serbian National Waste Management Strategy including National Waste Management Plan for the period 2020-2025 |
| **B.1.1** | 4 | Local Waste Management Plan 2010-2020. SID |
| **B.1.1** | 5 | Law on waste management |
| **B.1.1** | 6 | Draft Law on Amendments to the Law on Waste Management |
| **B.1.1** | 7 | Law on Amendments to the Law on Waste Management |
| **B.1.1** | 8 | Law on environmental protection |
| **B.1.1** | 9 | Law on amendments to the law on environmental protection |
| **B.1.1** | 10 | Law on Public Private Partnerships and Concessions |
| **B.1.1** | 11 | Business program of PUC-[Srem-Macva] Sabac for 2019 |
| **B.1.1** | 12 | Statistical yearbook 2020 |
| **B.1.1** | 13 | Draft Law on Amendments to the Law on Health insurance Public Hearing 4.2.2021. |
| **B.1.1** | 14 | Law about medicines and medical means |
| **B.1.1** | 15 | Law on Agricultural Land |
| **B.1.1** | 16 | Law on Air Protection |
| **B.1.1** | 17 | Law on Amendments to the Law on Agricultural Land |
| **B.1.1** | 18 | Law on Amendments to the Law on Chemicals 25-15 |
| **B.1.1** | 19 | Law on Amendments to the Law on Chemicals 88-10 |
| **B.1.1** | 20 | Law on Amendments to the Law on Chemicals 92-11 |
| **B.1.1** | 21 | Law on Amendments to the Law on Chemicals 93-12 |
| **B.1.1** | 22 | Law on Amendments to the Law on Integrated prevention and Control Environmental Pollution |
| **B.1.1** | 23 | Law on Amendments to the Law on Veterinary Science |
| **B.1.1** | 24 | Law on Amendments to the Law on Waters |
| **B.1.1** | 25 | Law on Capital Market |
| **B.1.1** | 26 | Law on Chemicals 36-09 |
| **B.1.1** | 27 | Law on communal activities |
| **B.1.1** | 28 | Law on Energy SG 145-2014 |
| **B.1.1** | 29 | Law on Impact Assessment |
| **B.1.1** | 30 | Law on Medical |
| **B.1.1** | 31 | Law on medical means |
| **B.1.1** | 32 | Law on Mining |
| **B.1.1** | 33 | Law on Organization and Jurisdiction of State Authorities in the Suspension of Organized crime, Terrorism and Corruption |
| **B.1.1** | 34 | Law on Plant Health |
| **B.1.1** | 35 | Law on Private Entrepreneurs |
| **B.1.1** | 36 | Law on Protection of Land-official version |
| **B.1.1** | 37 | Law on Protection of nature |
| **B.1.1** | 38 | Law on Sanitary supervision |
| **B.1.1** | 39 | Law on Standardization (2) |
| **B.1.1** | 40 | Law on Strategic Environmental Assessment |
| **B.1.1** | 41 | Law on termination of the Law on Environmental Protection Fund |
| **B.1.1** | 42 | Law on Water 30-10 and 93-12 |
| **B.1.1** | 43 | National program of environmental protection |
| **B.1.1** | 44 | Ordinance on harmonized amounts of compensation for environmental pollution |
| **B.1.1** | 45 | Ordinance on harmonized amounts of incentives for reuse, recycling |
| **B.1.1** | 46 | Ordinance on the content of land reclamation project and remediation |
| **B.1.1** | 47 | Overview of changing provisions |

| Activity | No | Document name (ENG) |
|---|---|---|
| **B.1.1** | 48 | Program of hearing on the draft Law on amendments to the Law on health Insurance |
| **B.1.1** | 49 | Regulation on products 2014 |
| **B.1.1** | 50 | Regulation on the amount and conditions for the allocation of incentive funds |
| **B.1.1** | 51 | Regulation on types of pollution, criteria for calculation of compensation for environmental pollution |
| **B.1.1** | 52 | Regulation on types of waste for which thermal treatment is performed |
| **B.1.1** | 53 | Rulebook on amendments to rulings on categories of testing and classification of waste |
| **B.1.1** | 54 | Rulebook on the manner and procedure of waste tire management |
| **B.1.3** | 1 | Law on ministries |
| **B.1.3** | 2 | Statute of Autonomous Province of Vojvodina |
| **B.1.3** | 3 | Law on local self-government |
| **B.1.3** | 4 | Law on Public Enterprises |
| **B.1.3** | 5 | Law on government |
| **B.1.3** | 6 | Law on employees in autonomous provinces and local self-government. |
| **B.1.3** | 7 | Law on Public Agencies |
| **B.1.3** | 8 | Law on Amendments to the Law on Public Agencies |
| **B.1.3** | 9 | Informatory on the Work of the Provincial Government-Vojvodina |
| **B.1.3** | 10 | Role of Ministry of Environmental Protection |
| **B.1.3** | 11 | Role of Environmental Protection Agency |
| **B.1.3** | 12 | Statute of the Municipality of ŠID |
| **B.1.3** | 13 | PUC-Rules on Organization and Systematization of Business and General Provisions |
| **B.1.3** | 14 | Rev-PUC-Rules on Organization and Systematization of Business and General Provisions |
| **B.1.3** | 15 | Statute of Public Utility Company STANDARD ŠID |
| **B.1.4** | 1 | Law on local government financing |
| **B.1.4** | 2 | Law on budget system |
| **B.1.4** | 3 | Law on public procurement |
| **B.1.4** | 4 | Law on salaries and employees in autonomous province and local self-government |
| **B.1.4** | 5 | Law on the Budget of the Republic of Serbia for 2021 |
| **C.1** | 1 | Law on packaging and packaging waste |
| **C.1** | 2 | Law on amendments to the law on packing and packing waste |
| **C.1** | 3 | Explanatory statement for packing and packing waste |
| **C.1** | 4 | Article 42, paragraph 4 of the Law on Packaging and Packaging Waste |
| **C.1** | 5 | Article 15, paragraph 5 of the Law on Packaging and Packaging Waste |
| **C.1** | 6 | Article 19, paragraph 3 of the Law on Packaging and Packaging Waste |
| **C.1** | 7 | Article 7, paragraph 2 of the Law on Packaging and Packaging Waste |
| **C.1** | 8 | Article 30, paragraph 3 of the Law on Packaging and Packaging Waste |
| **C.1** | 9 | Regulation on waste disposal on landfills |
| **C.1** | 10 | Rulebook on categories, testing and classification of waste |
| **C.1** | 11 | Rulebook on conditions, manner and procedure of waste oil management |
| **C.1** | 12 | Correct on the type and annual quantity of packaging used for packaged goods |
| **C.1** | 13 | Decree on establishing a plan for the reduction of packaging waste |
| **C.1** | 14 | Law on Amendments to the Law on Plant Protection Products |
| **C.1** | 15 | Ordinance on the content and appearance of the waste permit |
| **C.1** | 16 | Plastic bag policy |
| **C.1** | 17 | Regulation on the criteria for calculating the packaging fee |
| **C.1** | 18 | Rulebook on medical waste management |
| **C.1** | 19 | Rulebook on the content and appearance of the permit for storage, treatment and disposal of waste. |
| **C.1** | 20 | Rulebook on the content, manner of keeping and appearance of the register of issued waste management permits |

| Activity | No | Document name (ENG) |
|---|---|---|
| **C.1** | 21 | Rulebook on the form of the document on the movement of hazardous waste Sl.gl.114-2013 |
| **C.1** | 22 | Rulebook on the form of the document on the movement of hazardous waste Sl.gl.114-2013 |
| **C.1** | 23 | Rulebook on the form of the document on the movement of waste Sl.gl.114-2013 |
| **C.1** | 24 | Rulebook on the manner of storage, packaging and labeling of hazardous waste |
| **C.1** | 25 | Rules on the form requirement 2018 |

## 1.2 Excerpts from laws and regulations

### 1.2.1 Excerpt from Law on Waste Management

***The descriptions underlined in bule show the laws and regulations which have to be taken into account when the Project is implementated**

| Clause |
|---|
| **Definitions of expressions**<br>**Article 5**<br>13) **Municipal waste is waste generated by households (household waste), as well as other waste that is similar to household waste due to its nature or composition;** |
| 26) **A waste management region is a spatial unit that includes several neighboring local self-government units which, in accordance with an agreement concluded by those local self-government units, jointly manage waste in order to establish a sustainable waste management system;** |
| **Principles**<br>**Article 6**<br>Waste management is based on the following principles.<br>1) **The principle of choosing the most optimal option for the environment**<br>The selection of the most optimal option for the environment is a systematic and consultative decision-making process that includes the protection and preservation of the environment. The application of the choice of the most optimal option for the environment establishes, for the given goals and circumstances, the option or combination of options that gives the greatest profit or the least damage to the environment as a whole, with acceptable costs and profitability, both long-term and short-term. |
| 1a) **The principle of self-sufficiency**<br>The application of the principle of self-sufficiency implies the establishment of an integrated and appropriate network of facilities for the reuse and disposal of mixed municipal waste collected from households, including the collection of this type of waste generated by other waste producers, taking into account the best available techniques, in accordance with this law.<br>The network of these facilities should be designed to enable the Republic of Serbia to achieve the principle of self-sufficiency in waste disposal and waste reuse, taking into account the geographical characteristics of the region and the need for special facilities for certain types of waste. This network should enable the disposal or reuse of waste in one of the nearest appropriate facilities by the most appropriate methods and technologies, in order to ensure a high level of protection of the environment and public health. |
| 2) **The principle of proximity and regional approach to waste management**<br>Waste is treated or disposed of as close as possible to the place of its generation, i.e. in the region in which it was produced, in order to avoid undesirable consequences for the environment during the transport of waste. The choice of the location of the plant for the treatment, reuse, or disposal of waste is made depending on local conditions and circumstances, the type of waste, its volume, the mode of transport and disposal, and economic justification, as well as the possible impact on the environment. Regional waste management is ensured by the development and implementation of regional strategic plans based on European legislation and national policy. |
| 3) **Principle of waste management hierarchy**<br>The waste management hierarchy represents the order of priorities in waste management practice. |

| Clause |
| --- |
| The waste management hierarchy is applied as a priority in waste prevention and management, regulations, and policies:<br>• prevention;<br>• preparation for re-use;<br>• recycling;<br>• other reuse operations (reuse in order to obtain energy, etc.); and<br>• disposal.<br>When applying the order of the waste management hierarchy, measures shall be taken to encourage solutions that achieve the best overall result for the environment, which may require deviations from the hierarchy for specific waste streams where justified by the life cycle, taking into account the overall impacts on the generation and management of such waste.<br>The development of legislation and policy in the field of waste management is a fully transparent process, in accordance with the applicable regulations on consultation and involvement of citizens and all stakeholders.<br>The application of the principles of hierarchy takes into account the general principles of environmental protection, precaution and sustainability, technical feasibility and economic value, and protection of resources, as well as the overall impact on the environment, human health, and economic and social impacts. |
| 4) **The principle of responsibility**<br>Manufacturers, importers, distributors, and sellers of products that affect the increase in the amount of waste are responsible for the waste generated by their activities. The manufacturer bears the greatest responsibility because it affects the composition and properties of the product and its packaging. The manufacturer is obligated to take care of reducing waste generation, developing products that are recyclable, and developing markets for the reuse and recycling of their products. |
| 5) **"Polluter pays" principle**<br>The polluter must bear the full costs of the consequences of his activities. The costs of generation, treatment, reuse, and disposal of waste must be included in the price of the product. |
| **III WASTE MANAGEMENT PLANNING**<br>**Types of planning documents**<br>**Article 9**<br>For the purpose of waste management planning in the Republic of Serbia, the following planning documents are adopted:<br>1) waste management strategy (hereinafter “the Strategy”);<br>2) waste prevention programs;<br>3) regional waste management plans;<br>4) local waste management plans;<br>5) the waste management plan at the plant for which an integrated permit is issued; and<br>6) work plans for waste management facilities. |
| **Strategy**<br>**Article 10**<br>The Strategy is the basic document that determines and directs waste management in the long term, based on the analysis of the current situation and waste management objectives, and determines measures to improve waste management (preparation for reuse, recycling, reuse, disposal, and other waste treatment) in the Republic of Serbia.<br>The Strategy contains, in particular:<br>1) analysis and assessment of the state of waste management;<br>2) national waste management objectives; and<br>3) the National Waste Management Plan.<br>**The Strategy is adopted by the Government for a period of six years, and evaluated and revised as necessary once every three years.**<br>The Strategy is **prepared by the ministry in charge of environmental protection (hereinafter “the Ministry”) in cooperation with the competent authority of the Autonomous Province.**<br>The Strategy is published in the *Official Gazette of the Republic of Serbia*.<br>The report on the implementation of the Strategy is prepared by the Ministry and submitted to the Government at least once a year. |
| **National Waste Management Plan**<br>**Article 11** |

| Clause |
| --- |
| The National Waste Management Plan (hereinafter “the National Plan”), which is an integral part of the Strategy, contains in particular:<br>1) expected types, quantities, and origins of waste that will be produced on the territory of the Republic of Serbia and imported or exported to another country, including the assessment of the generation of special waste streams, based on the quantities of products placed on the market in the Republic of Serbia;<br>2) the existing waste collection system and network of large waste recovery and disposal facilities, including any treatment of waste oils, hazardous waste, and special waste streams;<br>3) assessment of the need for a new collection system, closure of existing waste management facilities, additional infrastructure of waste management facilities in accordance with the principles of self-sufficiency and proximity, and, if necessary, investments in the construction of that infrastructure;<br>4) a plan for the implementation of the reduction of biodegradable waste disposed of in landfills, measures to achieve the objective of reducing the disposal of this type of waste, especially for recycling, composting, biogas production, or reuse of materials/energy;<br>5) criteria for determining the location and necessary capacities of new plants for reuse and/or waste disposal;<br>6) organization of waste management, including the division of responsibilities between the public and private sectors in the field of waste management;<br>7) sources and amount of financial resources for the implementation of all waste management measures;<br>8) assessment of the beneficial effects and sustainability of the application of economic and other instruments in waste management, with the smooth functioning of the internal market;<br>9) measures and guidelines for the implementation of the National Plan; and<br>10) manner and deadlines for implementation of the National Plan. |
| **Regional waste management plan**<br>**Article 12**<br>**The assemblies of two or more local self-government units on whose territories at least 250,000 inhabitants live in total adopt a regional waste management plan for the territory of the Autonomous Province of the competent authority of the Autonomous Province,** which defines common goals in waste management in accordance with the Strategy.<br>The procedure for drafting and adopting the regional plan referred to in para. 1 and 2 of this Article shall be regulated by agreement of the assemblies of the local self-government units, in accordance with the law.<br>Waste management in the territory of two or more local self-government units from para. 1 and 2 of this Article shall be performed in accordance with the regional and local waste management plan. |
| **Local waste management plan**<br>**Article 13**<br>**The Assembly of the local self-government unit adopts a local waste management plan which defines the goals of waste management in its territory in accordance with the Strategy.**<br>The local waste management plan is prepared by the service of the local self-government unit responsible for waste management in cooperation with other bodies responsible for the economy, finance, environmental protection, and urban planning, as well as with representatives of companies, associations, professional institutions, and non-governmental and other organizations dealing with environmental protection, including consumer organizations. |
| **Period of validity and content of plans**<br>**Article 14**<br>**Waste management plans from Article 12 and 13 of this Law shall be adopted for a period of 10 years and shall be reviewed every five years, and, if necessary, revised and adopted for the next 10 years.** |
| **Republic of Serbia**<br>**Article 18**<br>The Republic of Serbia, through competent bodies and organizations, ensures waste management on its territory.<br>**The Ministry:**<br>1) proposes to the Government the Strategy, as well as waste prevention programs; |

| Clause |
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| 2) coordinates and performs waste management activities of importance for the Republic of Serbia and monitors the situation;<br>3) **gives consent to regional waste management plans, except for plans on the territory of the Autonomous Province;**<br>4) issues permits, consents, certificates, and other acts prescribed by this Law;<br>5) keeps records of permits, consents, certificates, and other acts issued by other competent authorities;<br>6) determines authorized organizations in accordance with this Law;<br>7) supervises and controls the application of waste management measures; and<br>8) undertakes other measures and activities, in accordance with international treaties and agreements. |
| **Autonomous Province**<br>**Article 19**<br>**Autonomous Province:**<br>1) participates in the development of the Strategy and programs for waste prevention;<br>2) **coordinates and performs waste management activities of importance for the Autonomous Province and monitors the situation;**<br>3) gives consent to regional waste management plans on its territory;<br>4) issues permits, consents, certificates, and other acts in accordance with this Law, keep records, and submits data to the Ministry;<br>5) **supervises and controls measures for waste management on its territory in accordance with this Law;** and<br>6) performs other tasks determined by law. |
| **Local self-government unit**<br>**Article 20**<br>Local self-government unit:<br>1) **adopts a local waste management plan, provides conditions, and takes care of its implementation;**<br>2) **regulates, provides, organizes, and implements the management of municipal, i.e. inert and non-hazardous waste, on its territory, in accordance with the law;**<br>3) regulates procedures for the collection of services in the field of municipal, i.e. inert and non-hazardous waste management, in accordance with the law;<br>4) issues permits, approvals, and other acts in accordance with this Law, keeps records, and submits data to the Ministry;<br>5) at the request of the Ministry or the competent body of the Autonomous Province, gives opinions in the procedure of issuing permits in accordance with this Law;<br>6) **supervises and controls waste management measures in accordance with this Law;** and<br>7) performs other tasks determined by law. |
| **Joint waste management of local self-government units**<br>**Article 21**<br>**Two or more local self-government units jointly provide and conduct waste management, under the conditions and in the manner determined by law, the Strategy, and the agreement of the assemblies of local self-government units.** |
| **Environmental Protection Agency**<br>**Article 22**<br>The Environmental Protection Agency (hereinafter “the Agency”) performs activities related to:<br>1) **maintaining and updating the database on waste management in the information system for environmental protection, in accordance with the law governing environmental protection.** |
| **Waste collection and transport**<br>**Article 35**<br>The person who collects or transports waste collects waste from the producer or owner and/or other holder and transports it to the waste management facility, i.e. to the center for collection or storage, a transfer station, or a treatment, reuse, or disposal facility.<br>**The competent authority shall take appropriate measures in accordance with Article 3 and Article 6, paragraph 1, item 3) of this Law so as to encourage:**<br>1) **separate collection of biowaste for purposes of composting and digestion;** |

| Clause |
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| 2) treatment of biowaste in such a way as to ensure a high level of environmental protection; and<br>3) use of environmentally safe materials produced from biowaste.<br>Waste is transported in a closed vehicle, packaging, container, or tank in order to prevent waste from falling out during transport, loading, or unloading, or the pollution of air, water, soil, and the environment. |
| **Reuse and reuse**<br>**Article 38**<br>The competent waste management authority shall also take measures to ensure the high quality of recycling and, to that end, establish separate waste collection where technically, environmentally, and economically feasible and appropriate, in order to meet the necessary quality standards for the relevant areas of recycling. |
| **Municipal waste management**<br>**Article 43**<br>Municipal waste is collected, reused, and disposed of in accordance with this Law and special regulations governing communal activities.<br>It is forbidden to mix hazardous waste with municipal waste.<br>Municipal waste that has already been mixed with hazardous waste is separated if it is economically viable; otherwise the waste is considered hazardous.<br>The local self-government unit, in accordance with the local plan, regulates and organizes:<br>1) selection and separate collection of waste, including the frequency of waste collection for recycling (paper, metal, plastic and glass);<br>2) ensures the disposal of household waste in containers or by other means; and<br>3) also provides equipment for collection centers from household waste that cannot be disposed of in containers for municipal waste (bulky, biodegradable, and other waste), including hazardous household waste.<br>Households are obligated to dispose of their waste in containers or in other ways provided by the local self-government unit, and hazardous household waste (waste batteries and accumulators, oils, waste from electrical and electronic products, paints and varnishes, pesticides, etc.) is to be handed over to household waste collection centers or to an authorized legal entity for hazardous waste collection.<br>Households and other producers of municipal waste select municipal waste for recycling.<br>The local self-government unit is obligated to keep records of illegal landfills and existing non-sanitary landfills on its territory and to ensure their removal and remediation.<br>The local self-government unit is obligated to prepare a project of remediation and reclamation for existing non-sanitary landfills, in accordance with the law governing environmental protection.<br>The public utility company that manages unsanitary landfills (municipal waste dumps) is obligated to submit to the Ministry, i.e. the competent authority of the Autonomous Province, for approval the work plan for the plant referred to in Article 16 of this Law, together with a program of corrective measures and dynamics of adjustment of the plant. Waste disposal at landfills is regulated. |
| **Competence for issuing permits**<br>**Article 60**<br>Permits for the collection, transport, treatment, i.e. storage, reuse, and disposal of hazardous waste, permits for the treatment of inert and non-hazardous waste by incineration, and permits for the treatment of waste in mobile plants are issued by the Ministry.<br>Permits for collection, transport, treatment, i.e. storage, reuse, and disposal of inert and non-hazardous waste on the territory of several local self-government units are issued by the Ministry, and on the territory of the Autonomous Province by the competent authority of the Autonomous Province.<br>The Autonomous Province is entrusted with issuing permits for collection, transport, treatment, i.e. storage, reuse, and disposal of waste for all activities on the territory of the Autonomous Province and for all facilities for which construction permits have been issued by the competent authority of the Autonomous Province.<br>The city, i.e. the municipality, is entrusted with the issuance of permits for collection, transport, treatment, i.e. storage, reuse, and disposal of inert and non-hazardous waste on their territory. |
| **X WASTE REPORTING AND DATABASES**<br>**Waste management reports** |

| Clause |
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| **Article 74**<br>The Report on Waste Management on the Territory of the Republic of Serbia is an integral part of the Report on the State of the Environment and is submitted to the National Assembly once a year.<br>**Once a year, the Assembly of the Autonomous Province considers the report on the implementation of regional and local plans on its territory and submits the report to the Ministry and the Agency.**<br>**Two or more local self-government units that have adopted a regional waste management plan consider the report on the implementation of the plan once a year and submit the report to the Ministry, the Agency, and the competent authority of the Autonomous Province.**<br>**The local self-government unit considers the report on the implementation of the local waste management plan once a year and submits the report to the Ministry, the Agency, and the competent authority of the Autonomous Province.** |
| **Reporting**<br>**Article 75**<br>**The unit of local self-government keeps records on collected municipal waste, as well as a list of unregulated landfills, and submits data on these to the Agency.** |
| **XI WASTE MANAGEMENT FINANCING**<br>**Waste management costs**<br>**Article 77**<br>**Waste management costs are determined according to the amount and properties of waste in accordance with the "polluter pays" principle and include:**<br>1) costs of separate waste collection;<br>2) costs of waste transportation;<br>3) costs of other waste management measures that are not covered by the income generated from waste turnover;<br>4) costs of disposal of waste disposed of by an unknown person outside of the landfill; and<br>5) costs of design and construction of treatment plants, i.e. storage, reuse, and disposal of waste; the costs of plant operation; the costs of plant closure; and the costs of subsequent maintenance of plants after operations cease. |
| **Responsibility of waste producers and owners**<br>**Article 78**<br>The producer or owner of waste shall bear the costs of collection, transport, storage, treatment, and disposal of waste in accordance with this Law.<br>**The costs of removing waste disposed of outside of the landfill, the origin of which cannot be determined, i.e. its connection with the producer, i.e. the person who disposed of it, shall be borne by the local self-government unit.**<br>Households shall bear the costs of waste management in accordance with the regulations governing communal activities. |
| **Price of waste management services**<br>**Article 79**<br>**A legal entity or entrepreneur that performs the activity of collection, transport, treatment, i.e. storage, reuse, and disposal of waste shall charge for its services according to the price determined in accordance with the law.**<br>**The price of the waste management service, which includes the previous treatment, is determined depending on the type, quantity, characteristics of the waste, and the frequency of the service, as well as the length and conditions of waste transport and other circumstances that affect the cost of waste management.**<br>**The price of the landfill service covers all costs of establishing and operating the landfill, including financial guarantees or other equivalent instruments and the estimated costs of closing and subsequent maintenance of the site for a period of at least 30 years, for all types of waste at the site.** |
| **Waste management financing**<br>**Article 80**<br>Funds for financing waste management in the Republic of Serbia are provided from:<br>**1) the budget of the Republic of Serbia;**<br>**2) the budget of the Autonomous Province and local self-government units;**<br>**3) European Union funds and other international funds;** |

| Clause |
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| 4) donations, gifts, aid, and similar sources for waste management;<br>5) loans from international financial institutions; and<br>6) other sources in accordance with the law.<br>The funds referred to in paragraph 1 of this Article may be used only for the purpose determined by this Law and in the manner prescribed by the law governing the protection of the environment.<br>The implementation of the Waste Management Strategy and Plans, as well as the construction of treatment facilities, i.e. storage, reuse, and disposal of waste, under the jurisdiction of the Republic of Serbia, the Autonomous Province, and local self-government units, is financed in accordance with the law. |
| **Use of funds to finance waste management**<br>**Article 81**<br>The Republic of Serbia and the Autonomous Province, i.e. the unit of local self-government, shall use the funds referred to in Article 80 of this Law for investment in and operational costs of waste management, as follows:<br>1) construction of new plants for waste management, reconstruction, revitalization, and utilization of existing plants;<br>2) improvement of waste management organization;<br>3) management of spent batteries and accumulators, waste oils, waste tires, waste from electrical and electronic products, waste from fluorescent tubes containing mercury, and End-of-life vehicles;<br>4) encouraging separate waste collection;<br>5) implementation of regional or local waste management plans;<br>6) development of a waste management information system;<br>7) assistance in the development and application of new technologies for waste treatment;<br>8) remediation of long-term pollution caused by industrial and municipal waste;<br>9) education and public awareness programs on environmental protection and waste management issues;<br>10) encouraging the market of recycled materials and the export of waste for which there is no possibility of treatment in the Republic of Serbia; and<br>11) other costs, in accordance with the law. |

### 1.2.2 Excerpts from the National Waste Management Strategy (2020-2025), Including the National Waste Management Plan

| Clause |
|---|
| **1.1 Role of the Waste Management Strategy and Waste Management Plan**<br>Sustainable waste management is an essential part of sustainable development. Environmentally-sound waste management is always a cross-cutting issue and requires an adequate network of collection systems, treatment, recycling, and disposal facilities. The Waste Management Strategy (WMS) defines the goals of an integrated national waste management system and the objectives necessary. The National Waste Management Plan (NWMP), as part of the Strategy, is a tool for identifying and implementing the measures necessary to meet these goals and sets benchmarks for the short-term and mid-term implementation of the WMS. |
| **2.2.1 EU policy and legislation in the area of waste management**<br>**Minimum requirements to enhance recycling**<br>Directive (EU) 2018/851 amending Directive 2008/98/EC on waste was published in the *Official Journal of the European Union* on June 14, 2018 as a part of the European Circular Economy Package. The main elements of the amendments of the Directive include:<br>• Increase of preparation for the re-use and recycling target for municipal waste: 55% by 2025, 60% by 2030, and 65% by 2035;<br>• Strict recycling calculation rules based on input into recycling and, as of January 1, 2027, Member States may only count municipal bio-waste entering aerobic or anaerobic treatment as recycled if it has been separately collected or separated at source;<br>• By December 31, 2023, bio-waste shall either be separated and recycled at source or collected separately and shall not be mixed with other types of waste. This includes the |

**Clause**

obligation to encourage home composting, and the obligation to compost and digest[1] bio-waste, resulting in compost or digestive that meet relevant high-quality standards;

- Concrete measures to promote re-use and prevention (including prevention of food waste);
- Improvement of definitions, harmonization of calculation methods for recycling rates, and streamlining of reporting obligations;
- Introduction of minimum operating conditions for Extended Producer Responsibility (EPR);
- Economic incentives for producers to put greener products on the market and support recovery and recycling schemes;
- Setting up of systems promoting repair and re-use activities for textiles and furniture; and
- Separate collection for textiles.

**The reduction of biodegradable waste going to landfills**

The setting up of a national strategy for the implementation of the reduction of biodegradable waste going to landfills. This strategy shall ensure that:

- not later than five years after the date laid down in Article 18(1), biodegradable municipal waste going to landfills must be reduced to 75% of the total amount (by weight) of biodegradable municipal waste produced in 1995 or the latest year before 1995 for which standardized Eurostat data is available;
- not later than eight years after the date laid down in Article 18(1), biodegradable municipal waste going to landfills must be reduced to 50% of the total amount (by weight) of biodegradable municipal waste produced in 1995 or the latest year before 1995 for which standardized Eurostat data is available; and
- not later than 15 years after the date laid down in Article 18(1), biodegradable municipal waste going to landfills must be reduced to 35% of the total amount (by weight) of bio-degradable municipal waste produced in 1995 or the latest year before 1995 for which standardized Eurostat data is available.

**2.3 Current waste generation**

According to SEPA, the total generation of waste in Serbia in 2016 was 9.2 million tonnes, out of which 74.000 tonnes were classified as hazardous waste. Table 3 shows the quantities of waste generated in Serbia in 2016 broken down by the 2-digit chapter codes of the List of Waste. The data covers quantities reported by companies which submit annual reports to the Environmental Protection Agency on the types and quantities of waste generated.

Table 3: Quantities of Waste Generated in Serbia in 2017 (in Tonnes) Broken Down by the Two-digit Chapter Codes of the List of Waste. (Source: Waste Management in the Republic of Serbia for the Period 2011-2017; SEPA, 2018)

| Chapter | Waste | Quantity |
|---|---|---|
| 01 | Waste resulting from exploration, mining, quarrying, physical and chemical treatment of minerals | / |
| 02 | Waste from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing | 36.219 |
| 03 | Waste from wood processing and the production of panels and furniture, pulp, paper and cardboard | 33.238 |
| 04 | Wastes from the leather, fur and textile industries | 7.830 |
| 05 | Waste from petroleum refining, natural gas purification and pyrolytic treatment of coal | 5.442 |
| 06 | Waste from inorganic chemical processes | 1.077 |
| 07 | Waste from organic chemical processes | 8.645 |
| 08 | Waste from the manufacture, formulation, supply and use (MFSU) of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks | 3.612 |
| 09 | Waste from the photographic industry | 241 |
| 10 | Waste from thermal processes | 8.249.653 |
| 11 | Waste from chemical surface treatment and coating of metals and other materials; non-ferrous hydro- metallurgy | 1.828 |

[1] Anaerobic fermentation

| Clause | | |
|---|---|---|
| 12 | Waste from shaping and physical and mechanical surface treatment of metals and plastics | 70.454 |
| 13 | Oil waste and wastes of liquid fuels (except edible oils, 05 and 12) | 10.212 |
| 14 | Waste organic solvents, refrigerants and propellants (except 07 and 08) | 27 |
| 15 | Waste packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified | 118.013 |
| 16 | Waste not otherwise specified in the list | 55.319 |
| 17 | Construction and demolition waste (including excavated soil from contaminated sites) | 230.535 |
| 18 | Waste from human or animal health care and/or related research (except kitchen and restaurant waste not arising from immediate health care) | 2.964 |
| 19 | Waste from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use | 404.873 |
| 20 | Municipal waste (household waste and similar commercial, industrial and institutional waste) including separately collected fractions | 2.237.432 |
| TOTAL | | 11.477.614 |

## 2.4 Current status of relevant waste streams

### 2.4.1 Municipal waste

According to the LWM, municipal waste means “household waste, as well as other waste which is similar to household waste due to its nature or composition”. To a large extent, municipal waste consists of the waste generated by households, but it may also include similar waste generated by small businesses and public institutions and collected directly by or on behalf of municipalities or by private operators.

Table 4: Quantity of Waste from Category 20 of the List of Waste in Tonnes/Year. (Source: Waste Management in the Republic of Serbia for the Period 2011-2017; SEPA, 2018)

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|
| Municipal waste | 2,733,825 | 2,658,549 | 2,454,520 | 2,186,297 | 1,936,309 | 1,963,776 | 2,237,432 |
| Total | 7,337,333 | 10,601,454 | 9,881,313 | 7,451,105 | 9,354,680 | 9,197,100 | 11,477,614 |

Table 5: Quantities of Utility Waste. (Source: Waste Management in the Republic of Serbia for the Period 2011-2017; SEPA, 2018)

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|
| Total quantity of generated waste (million tonnes) | 2.71 | 2.62 | 2.41 | 2.13 | 1.84 | 1.89 | 2.15 |
| Quantity of waste collected and deposited by municipality PUCs (million tonnes) | 2.09 | 1.83 | 1.92 | 1.67 | 1.36 | 1.49 | 1.80 |
| Average scope of waste collection (%) | 77 | ~ 70 | 80 | ~80 | 82 | ~82 | 83.7 |
| Average daily quantity of utility waste per inhabitant (kg) | 1.01 | 0.99 | 0.92 | 0.81 | 0.71 | 0.73 | 0.84 |
| Average annual quantity per inhabitant (t) | 0.37 | 0.36 | 0.34 | 0.30 | 0.26 | 0.27 | 0.30 |

**Clause**

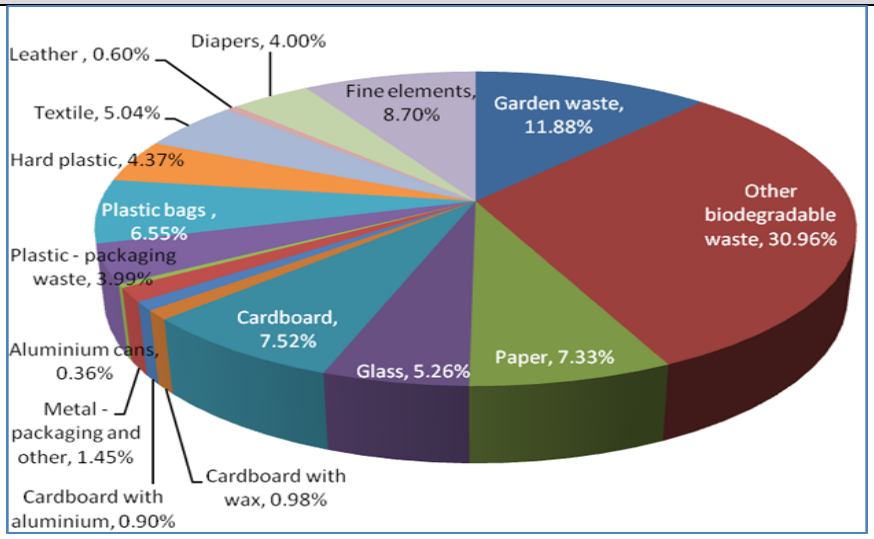


Figure 3: Average morphological composition of mixed municipal waste in Serbia
Source: Batinic 2014, *Report on Municipal Solid Waste Information*, reference year 2008)

Waste management issues are not equally and evenly present in all municipality units, and the activities related to the introduction of an integrated system are not conducted with the same intensity. Rather, they primarily depend on the capacities of a municipality. Such an incoherent system cannot function adequately and changing such conditions in the direction of applying modern sanitary and safe methods for handling waste cannot be expected without significant assets. The only economically feasible solution would be the establishment of regional waste management centers, where the waste collected from several municipalities (including separately collected waste fractions) are treated at plants for the separation of recyclable waste, with the rest of it disposed of at regional landfills, as defined in the 2003 National Waste Management Strategy. These regions will implement the principles of integrated waste management system for a longer period.

Table 6: Waste Management Regions (Sources: Investment Planning Tool (Solid Waste Management in Serbia) and Implementation Plan for Council Directive 1999/31/EC on the landfilling of waste)

| Region | Ownership | Municipalities |
|---|---|---|
| **Sremska Mitrovica** | Public | Bogatić, Šabac, Sremska Mitrovica. |
| **Pančevo** | Public | Opovo, Pančevo. |
| **Inđija** | Public | Inđija, Irig, Pećinci, Ruma, Šid, Sremski Karlovci, Stara Pazova. |
| **Užice** | Public | Arilje, Bajina Bašta, Čačak, Čajetina, Ivanjica, Kosjerić, Ljubovija, Lučani, Požega, Užice. |
| **Pirot** | Public | Babušnica, Bela Palanka, Dimitrovgrad, Pirot. |
| **Kikinda** | Majority private | Ada, Bečej, Kikinda, Nova Crnja, Novi Bečej. |
| **Lapovo** | Majority private | Batočina, Despotovac, Lapovo, Rača, Svilajnac. |
| **Jagodina** | Majority private | Ćuprija, Jagodina, Paraćin, Smederevska Palanka, Velika Plana. |
| **Leskovac** | Majority private | Bojnik, Crna Trava, Lebane, Leskovac, Medveđa, Prokuplje, Vladičin Han, Vlasotince, Žitorađa. |
| **Subotica** | Public | Bačka Topola, Čoka, Kanjiža, Mali Iđoš, Novi Kneževac, Senta, Subotica. |
| **Valjevo** | Public | Barajevo, Koceljeva, Lajkovac, Lazarevac, Ljig, Mionica, Obrenovac, Osečina, Ub, Valjevo, Vladimirci. |
| **Zrenjanin** | IMCA | Kovačica, Sečanj, Titel, Žitište, Zrenjanin. |
| **Nova Varoš** | IMCA | Nova Varoš, Priboj,Prijepolje, Sjenica. |
| **Vranje** | IMCA | Bosilegrad, Bujanovac, Preševo, Surdulica, Trgovište, Vranje. |
| **Beograd** | Public | Čukarica, Grocka, Mladenovac, Novi Beograd, Palilula, Rakovica, Savski venac, Sopot, Stari Grad, Surčin, Voždovac, Vračar, Zemun, Zvezdara. |

| Clause | | |
|---|---|---|
| **Novi Sad** | IMCA | Bačka Palanka, Bački Petrovac, Beočin, Novi Sad, Srbobran, Temerin, Vrbas, Žabalj. |
| **Niš** | IMCA | Aleksinac, Doljevac, Gadžin Han, Merošina, Niš, Ražanj, Sokobanja, Svrljig. |
| **Sombor** | IMCA | Apatin, Bač, Kula, Odžaci, Sombor. |
| **Vršac** | IMCA | Alibunar, Bela Crkva, Plandište, Vršac. |
| **Zaječar** | IMCA | Boljevac, Bor, Kladovo, Knjaževac, Majdanpek, Negotin, Zaječar. |
| **Smederevo** | IMCA | Golubac, Kovin, Smederevo, Veliko Gradište. |
| **Kragujevac** | IMCA | Aranđelovac, Gornji Milanovac, Knić, Kragujevac, Topola |
| **Kraljevo** | IMCA | Kraljevo, Novi Pazar, Raška, Tutin, Vrnjačka Banja. |
| **Kruševac** | IMCA | Aleksandrovac, Brus, Ćićevac, Kruševac, Rekovac, Trstenik, Varvarin. |
| **Petrovac** | IMCA | Kučevo, Malo Crniće, Petrovac, Požarevac, Žabari, Žagubica. |
| **Loznica** | IMCA | Krupanj, Loznica, Mali Zvornik. |
| **Undefined** | | Blace, Kuršumlija. |

## 2.5 Current status of special waste streams

### 2.5.1 Packaging waste

Table 13: Packaging quantities placed on the market by producers/importers/fillers organized in a collective/individual scheme, in tonnes. (Source: SEPA, annual reports.)

| Type | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|---|---|
| **Glass** | 65.224,12 | 85.534,4 | 77.774,4 | 61.496,8 | 55.236,8 | 57.115,5 | 58.155,2 |
| **Plastic** | 83.118,28 | 80.373,3 | 87.742,9 | 84.568,6 | 86.878,9 | 90.811 | 89.492,6 |
| **Paper and cardboard** | 91.352,04 | 101.957,1 | 103.738 | 102.152,5 | 105.532,3 | 108.751,1 | 109.159,6 |
| **Metal** | 8.333,17 | 11.218,0 | 11.992,3 | 12.608,7 | 12.546,3 | 13.661,9 | 13.626,7 |
| **Wood** | 44.220,72 | 52.905,9 | 56.539,1 | 55.057,7 | 62.982,4 | 68.449,2 | 73.475,6 |
| **Other** | 1.766,60 | 2.268,3 | 2.622,6 | 1.443 | 1.231,9 | 907,1 | 752,1 |
| **TOTAL** | 294.014,93 | 334.257,0 | 340.409,3 | 317.327,3 | 324.408,6 | 339.695,8 | 344.661,8 |

# 3 NATIONAL WASTE MANAGEMENT GOALS

The overall goal is to develop a sustainable waste management system in order to reduce environmental pollution and spatial degradation. In order to achieve this overall goal, the legal framework shall be fully harmonized with EU legislation, institutional set-up needs to be further improved, key principles of waste management must be implemented, and a network of waste management installations needs to be established and operated. Waste management must be geared towards defined waste management objectives which are laid down in the Strategy. Financial measures need be implemented to direct waste streams to the appropriate treatment options.

**Sustainable development principle**

The principle of sustainable development postulates the fulfilment of the needs of today's generation without threatening the opportunity of future generations to meet their needs. Sustainable development seeks to achieve, in a balanced manner, economic development, social development, and environmental protection, ensuring:

- The reduction of poverty;
- Fair distribution of wealth;
- Improvement of quality of life;
- Reduction of the level of pollution to the level of environmental capacity;
- Prevention of future pollution; and
- Biodiversity conservation.

Thus, sustainable waste management means the implementation of all necessary measures for the most efficient use of resources, the reduction of the quantity of generated waste, and, once the waste has been generated, handling it in such a manner that it contributes to the objectives of sustainable development, including re-introducing resources through recycling.

**Precautionary principle**

The precautionary principle means that "in case there is a possibility of a serious and irreversible damage, the absence of full scientific credibility may not be used as a reason for not taking measures to prevent the degradation of the environment". Each activity must be planned and implemented in such a manner so as to cause the least possible change to the environment. In cases of potential and

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| significant impacts on the environment, preventive activities should be taken, while the application of environmental impact assessment instruments should be particularly supported.<br>**Principle of selection of the most favorable option for the environment**<br>The selection of the most favorable option for the environment is a systematic approach. The assessment of the environmental impact of different options allows for the determination of the option, or a combination of options, which comprises the highest benefit and/or the least harm for the environment as a whole, with acceptable costs and profitability, both in the long and short term. In cases of a conflict between the principle of vicinity or the application of the waste hierarchy with the principle of selection of the most favorable option for the environment, the latter may prevail.<br>**The principle of self-sufficiency**<br>The application of the self-sufficiency principle means the establishment of an integrated and suitable network of plants for the recovery and disposal of mixed municipal household waste, including the collection of this type of waste produced by other waste producers, taking into account the best available technologies.<br>The network shall be designed to enable the Republic of Serbia to become self-sufficient in waste disposal and in waste recovery, taking into account geographical characteristics of the region and the need for separate plants for specific types of waste.<br>This network should enable the disposal or recovery of waste at one of the nearest appropriate plants, with the application of the most appropriate methods and technologies in order to ensure a high level of environmental and public health protection.<br>**Principle of vicinity and regional approach in waste management**<br>Waste shall be treated or disposed of as near as possible to its place of origin, i.e. in the region where it has been generated, in order to avoid undesirable environmental impacts from its transportation. The selection of a location for a plant for waste treatment and/or recovery and/or disposal shall depend on local conditions and circumstances, the type and volume of waste, manner of transportation and disposal, and economic viability, as well as the possible environmental impact. Regional waste management shall be ensured through the development and application of regional strategic plans in line with the overall national strategy, based on European legislation and national policy.<br>**The hierarchy of measures in waste management**<br>The hierarchy in waste management means the following order of priorities in waste management practice:<br>• Prevention: Measures taken before a substance, material, or product has become waste, that reduce: the quantity of waste, including through the reuse of products or the extension of the life span of products; the adverse impacts of the generated waste on the environment and human health; and the content of harmful substances in materials;<br>• Preparation for Reuse: Operations related to the reuse of waste which include cleaning (e.g. used clothing), functional testing (e.g. of electrical and electronic devices or components thereof), or the repair and refurbishment of discarded equipment, by which products or components of products that have become waste are prepared so that they can be reused without any other pre-processing;<br>• Recycling: the reprocessing of waste materials into products, materials, or substances, whether for the original or other purposes (“bottle to bottle”, “metal to metal”, composting);<br>• Other Recovery: Utilization of waste value for other useful purposes by replacing other materials which would otherwise have been used to fulfil a particular function, or waste that is prepared to fulfil that function, in the plant or in the wider economy (e.g. backfilling, re-cultivation, energy recovery, other energetic or chemical utilization); and<br>• Disposal: Any operation which is not the recovery of waste, even when substances are re-claimed or when energy is produced as a secondary effect of such an operation (e.g. incineration without energy recovery, landfilling).<br>However, the waste hierarchy is not an absolute principle. Measures need to be implemented to achieve solutions which will generate the best possible overall result for the environment. General environmental principles must also be taken into account, such as the precautionary principle and sustainability principle, technical feasibility, economic viability, and the protection of resources, as well as the general impact on the environment, human health, the economy, and social aspects. In specific cases, it may be necessary to depart from the strict hierarchy in order to comply with the other key principles. For example, for POPs wastes (POP content above a “low level” as defined in the guidelines of the |

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| Stockholm Convention or pertinent legislation), other treatments which destroy or transform the POPs content (e.g. incineration) take precedence over recycling.<br>**Extended Producer Responsibility**<br>The scheme of Extended Producer Responsibility (EPR) is a strategy to internalize the environmental costs of the production and consumption of a specific product. The producer of a product bears responsibility for the impact of the produced good over the whole life cycle, including disposal ("from cradle to grave"). The producer bears the greatest responsibility because he influences the composition and the characteristics of a product and its packaging material. The producer must take care of minimizing waste generation, the development of recyclable products, and the development of markets for the reuse and recycling of their products. The producers or, failing that, importers and sellers, may fulfil their obligations either individually or collectively (inclusion into a collective scheme), depending on the specific implementing legislation.<br>**"Polluter pays" principle**<br>To ensure financially sustainable activity in waste management, the "polluter pays" principle shall be applied. Polluters must bear the full cost of the consequences of their activities. Thus, the costs of collection, treatment, and disposal of waste must be included in the price of a product. The principle of full cost recovery for the services of collection and disposing of waste should be applied, as well as the introduction of financial stimulation instruments for the reuse and recycling of waste. |
| **3.3 Improvement of institutional set-up**<br>To meet the recycling targets as well as reduction targets (e.g. of the share of biodegradable wastes sent to landfill) a strengthening of the institutional set-up for waste collection is a necessary prerequisite. Therefore the following steps for the improvement of the institutional set-up seem to be necessary:<br>• Strengthening of the local self-government units, municipalities, and cities in order to achieve full implementation of the local waste management services;<br>• Development and implementation of a program of training and technical assistance to municipalities;<br>• Review of the effectiveness of existing waste management regions and establishment of waste management regions in the areas where they do not exist, including the establishment of responsible institutions (legal entities);<br>• Establishment of regional waste management companies providing separate collection of recyclables. Obligation of the private sector to establish collective schemes for specific waste streams (as to be stipulated in amended legislation – see Chapter 3.2.1);<br>• Strengthening of the "Green Fund" as a complementary instrument to the EPR schemes; and<br>• Strengthening of environmental inspections to gain the full compliance of stakeholders with their legal obligations. |
| **3.4 Establishment of a network of waste management facilities**<br>Environmentally sound waste management always needs a comprehensive approach and a chain of consecutive steps of collection – transport – treatment – use of recovered material and storage and disposal of unrecoverable residues. Thus, a suitable collection system for specific waste streams (municipal waste, packaging wastes, WEEEs, etc.) with collection points, transfer stations, and storage is a relevant part of a network of waste management facilities.<br>Furthermore, specific waste streams require specific treatment and consecutive disposal options. To comply with the key principles of sustainable waste management, an integrated network of waste management facilities (including collection systems) covering all of the undertakings in a chain of treatment steps is necessary. In assessing these needs, the export or even import of specific wastes, if a treatment cannot be provided in line with the economic scale necessary, is also an option to be taken into account. Different waste streams, however, require different solutions.<br>The integrated network of treatment installations is mandatory by 2024 for the waste management regions of Subotica, Vranje, Kruševac, Užice, Pančevo, Pirot, Sremska Mitrovica, Nova Varoš, Novi Sad, Kragujevac, Zrenjanin, Valjevo, and Belgrade, and is voluntary for all other waste management regions and shall cover:<br>• Source separation at the household level should be organized via the bin/bag system (including vehicles), at least for the following waste streams:<br>➢ recyclables including specific special waste streams such as packaging waste (metals, plastics, glass, paper and cardboard, wood);<br>➢ bio-degradable waste; (food and garden green waste); and<br>➢ non-hazardous residual mixed municipal solid waste. |

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| • Public amenity sites to be established at the municipality level (covering waste streams such as bulky waste, green park waste (e.g. from cuttings in gardens), packaging waste (including waste from special waste streams such as metals, glass plastics, paper and cardboard, wood), hazardous waste from households (including waste from special waste streams such as WEEEs, used batteries and accumulators, waste oil, medical and pharmaceutical waste), asbestos containing waste (small scale storage possibility);<br>• Home-composting in rural areas at the household level (covering waste streams such as biodegradable waste, including green waste);<br>• Composting facilities at the municipal level (covering waste streams such as biodegradable waste, including green waste);<br>• Transfer stations/storage areas for interim storage at the regional level (covering waste streams such as C&D waste[2], hazardous waste, municipal waste);<br>• Secondary separation and mechanical sorting of recyclables (at least eight facilities in the dedicated regions);<br>• Mechanical-biological treatment of mixed municipal solid waste (at least one facility in the indicated regions);<br>• Mobile treatment facilities for mineral construction and demolition waste at regional level;<br>• Incinerator dedicated for thermal waste treatment of municipal waste (at least one facility in Serbia);<br>• Incinerator dedicated for organic industrial and medical waste (at least one facility in Serbia);<br>• Physical-chemical treatment for hazardous waste (at least one facility in Central Serbia).<br>• Regional sanitary landfills for residues and pre-treated municipal waste at the regional level (also covering selected hazardous wastes such as asbestos containing waste); |
| **3.5 Waste management objectives**<br>**3.5.1 Short term objectives**<br>The DSIPs for the WEEE-Directive, WBA-Directive, PPW-Directive, WF-Directive, and Landfill-Directive reflect an implementation period for the achievements of the targets defined in the specific directives far beyond the time frame of the WMS 2020–2025. However, as short-term objectives the legal and institutional framework for the implementation of the Directives and pilot projects are to be implemented. This includes:<br>• The adoption of a new law which fully transposes Directive 2012/19/EU by 2021;<br>• Implementation of a pilot project for the selective collection of WEEE at the designated collection points by 2022;<br>• Collecting WEEE from citizens through retail network on a “one-to-one basis”, free of charge by 2024;<br>• By 2024, an increase in the separate collection of WEEE to 20% of the WEEE placed on the market in the three years preceding 2024;<br>• The adoption of a new legal framework to implement Article 17 (on producer registration) of Directive 2013/56/EU and provide for a fully functional EPR scheme by 2021:<br>• Installation of a register in accordance with Article 17 of Directive 2013/56/EU by 2022;<br>• The collection of portable batteries through retail networks, educational institutions, and public buildings by 2025;<br>• An increase in the collection rate for portable batteries and accumulators to 25% by 2031;<br>• The provision of a legal framework for a separate collection system for recyclables by 2021.<br>• The stepwise introduction of a separate collection of recyclables;<br>• An increase in the recycling rate of wastes from households to 25% overall by weight by 2025; and<br>• An increase in the level of diversion as percentage of totally generated paper and cardboard in Serbia to 25% by 2025;<br>To create the preconditions for achieving the targets, the Government and Parliament should complete the transposition of the EU Directives into law. |
| **3.5.2 Long term objectives**<br>Although full compliance with the relevant targets for separate collection, recycling, and reduction will be reached far beyond the timeframe of the WMS, the following long-term objectives can be defined:<br>• By the end of 2030, increase the recycling rate of wastes from households to 35% overall by weight, and to 45% by the end of 2035; |

[2] construction and demolition waste

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| • By the end of 2029, increase the recycling rate for C&D waste to 40% by weight and to 70% by weight by the end of 2034;<br>• By the end of 2029, increase the level of diversion as percentage of the total volume of paper and cardboard generated in Serbia to 35%, and to 50% by the end of 2034;<br>• By the end of 2029, increase the level of diversion as percentage of totally generated bio-waste in Serbia to 40% and to 60% by the end of 2034;<br>• By the end of 2028, reduce the biodegradable waste going to landfills to 75% of the total amount of biodegradable waste generated in 2008 (maximum amount to be landfilled), to 50% by the end of 2032, and to 35% by the end of 2039;<br>• By 2027, increase the separate collection of WEEE to 27% of EEE placed on the market in the three years preceding 2027, and by 2031 increase the separate collection of WEEE to 45% of EEE placed on the market in the three preceding years;<br>• By 2028 comply with the collection and recycling targets of Directive 94/62/EC; and<br>• By 2035 comply with the collection and recycling targets of Directive (EU) 2018/852. |

### 3.5.3 Targets for recycling and reduction

The targets for reduction and recycling in accordance with the Directive Specific Implementation Plan (DSIP) for the WFD 2008/98/EC, the PWD 94/62/EC and the WEEED 2012/19/EC are listed in Table 39. In the DSIP for packaging waste, it is assumed that Serbia will reach the targets in accordance with Directive 94/62/EC by 2028. Thus, the new targets introduced by Directive (EU) 2018/852 for 2025 should be reached at least by 2035 (applying the implementation period of seven years as provided by the Directive in general).

Table 39: Recycling and Reduction Targets to Be Implemented from 2024 to 2035

| Target | 2024 | 2025 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|
| **Recycling of household waste** | | 25% | | | | 35% |
| **Recycling of paper and cardboard** | | 25% | | | 35% | |
| **Recycling of bio-waste** | | 20% | | | 40% | |
| **Recycling of C&D waste** | | | | | 40% | |
| **Collection rate of WEEE** | 20% | | 27% | | | |
| **Reduction of biodegradable waste on landfill (reference year 2008)** | | | | by 25 | | |
| **Coverage of separate collection of packaging waste** | 50% | 55% | 85% | 100% | | |
| **Recycling/recovery of packaging waste** | 46% | | 51% | | 53% | |
| **Glass** | 44% | 49% | 57% | | 64% | |
| **Plastic** | 31% | 32% | 34% | | 35% | |
| **Paper** | 59% | 60% | 63% | | 63% | |
| **Metal** | 46% | 52% | 61% | | 68% | |
| **Wood** | 50% | 50% | 50% | | 50% | |

## THE NATIONAL WASTE MANAGEMENT PLAN

## 4 EXPECTED TYPES, QUANTITIES, AND ORIGIN OF WASTE, INCLUDING ESTIMATIONS RELATED TO GENERATION OF SPECIFIC WASTE STREAMS

### 4.1.1 Municipal waste

Table 40: Projected Amount of Generated Municipal Waste for Serbia from 2014 to 2030

| Year | Generated waste amount | | |
|---|---|---|---|
| | kg/cap/day | kg/cap/Year | t/Year |
| 2014 | 0.93 | 340.7 | 2,448,566 |
| 2015 | 0.94 | 343.5 | 2,468,363 |
| 2016 | 0.95 | 347.6 | 2,498,382 |
| 2017 | 0.96 | 352.1 | 2,530,283 |
| 2018 | 0.98 | 357.0 | 2,566,067 |
| 2019 | 0.99 | 362.3 | 2,603,892 |
| 2020 | 1.01 | 367.9 | 2,644,308 |
| 2021 | 1.02 | 373.2 | 2,682,116 |
| 2022 | 1.04 | 378.7 | 2,721,803 |
| 2023 | 1.05 | 384.5 | 2,763,469 |

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|---|---|---|---|---|
| | 2024 | 1.07 | 390.6 | 2,807,218 |
| | 2025 | 1.09 | 397.0 | 2,853,162 |
| | 2026 | 1.11 | 403,7 | 2,901,416 |
| | 2027 | 1.13 | 410,8 | 2,952,104 |
| | 2028 | 1.15 | 418,2 | 3,005,355 |
| | 2029 | 1.17 | 426 | 3,061,308 |
| | 2030 | 1.19 | 434,1 | 3,120,105 |

**5 EXISTING WASTE COLLECTION SYSTEM AND NETWORK OF LARGE WASTE RECOVERY AND DISPOSAL FACILITIES INCLUDING ANY TREATMENT OF WASTE OILS, HAZARDOUS WASTE AND SPECIAL WASTE STREAMS**

**5.1 Existing waste collection systems of relevant waste streams**

**5.1.1 Municipal waste**

In Serbia, the coverage of waste collection service ranges from only 25% to 100% in some municipalities. Based on data from SEPA (reports from PUCs) the collection rate of organized municipal waste collection amounts to ~82% in the Republic of Serbia. Collection is organized primarily in urban areas, whereas rural areas are significantly less covered.

In urban areas, for municipal waste, the most common type of container used is a 1.1 m³ container, while in some urban areas there are underground containers of 3 m³ and 5 m³. In semi-urban areas, the most common types of containers used are 1.1 $m^3$ and 240 liter bins (each household has its own waste bin). In rural areas, where there are no flats, waste is collected from each household using plastic sacks or 240 / 140 / 80 bins.

The provision of municipal waste collection and disposal services is typically undertaken by the local public utility company (PUC) that is owned and directed by the local self-government unit. These services may also be conducted under agreement with a private provider. The organization of transport and distribution of containers mostly rely on free assessment and previous practice, rather than on appropriate analyses based on the changing number of population, the frequency of filling and emptying of containers, and the capacity of vehicles.

Currently, the main problems associated with the collection system for municipal waste are:

- Inadequate number and structure of containers for waste collection;
- Inadequate distribution of containers;
- Lack of appropriate vehicles for transport of waste;
- Inadequate frequency of transport of waste; and
- Inadequate routes of vehicle moving.

**5.2 Existing collection systems for special waste streams**

**5.2.1 Packaging waste**

The packaging waste from household flow is collected by waste management companies (public utility companies), mingled with municipal waste, while for buy-back of some packaging waste types (usually PET and cardboard, waste with a high market value) private companies get contracts from the local authorities. Also, in accordance with Article 43 of the LWM, municipalities must organize the separate collection of waste and set up the frequency for waste collection for recyclables (paper, metal, plastic and glass). At present, the separate collection system of packaging waste from household flow is not extended to the entire country. The population connected to sanitation services through sanitation operators represents 60% of the population in urban areas, while rural areas are not sufficiently covered by organized waste collection.

**6 ASSESSMENT OF NEEDS FOR NEW COLLECTION SYSTEM, ADDITIONAL INFRASTRUCTURE IN WASTE MANAGEMENT FACILITIES IN COMPLIANCE WITH SELF-SUFFICIENCY AND PROXIMITY PRINCIPLES, AND AS NECESSARY, INVESTMENTS INTO THE CONSTRUCTION OF SUCH INFRASTRUCTURE**

**6.1 Assessment for relevant waste streams**

**6.1.1 Municipal waste**

Based on the description of the municipal waste management related aspects in previous chapters, the following gaps exist, which are important for the implementation of a sustainable municipal waste management system in Serbia:

- Not all municipalities have guaranteed the conditions for the use of public waste management services by waste holders located in their territory. Currently, the coverage of waste collection in Serbia is about 82%;

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| • Separate collection of recyclables and bio-waste is not yet implemented adequately;<br>• Hazardous waste from households is not collected separately from the mixed municipal waste stream;<br>• Most of the municipal waste goes to landfills untreated and a significant proportion of municipal waste is still being disposed of in non-sanitary landfills;<br>• Recycling targets for municipal waste (50%) are not yet achieved. Currently the recycling rate for municipal waste is about 3%. |
| **6.3.1 Source separation and collection system for households**<br>The collection of municipal waste can in principle be carried out in two ways: the waste is presented to collection points by the inhabitants themselves or waste collection is carried out via a detour route. The preferred method should be chosen in accordance with the local situation, taking into account such things as the population density, the population structure, and the amount of separate collected fractions. Depending on a geographical region (whether there are more villages with smaller populations or urban agglomerations with block apartments or separate houses), these will be combined. The decision whether to implement one or another scheme, or a combined solution, depends on local public authorities.<br>• "PICK – UP" collection directly from holdings (mixed municipal waste, packaging waste, hazardous household generated waste);<br>• "BRING" residents bring waste;<br>➢ Collective used container sites (mixed municipal waste, paper, plastic, glass, metal, textile, separately collected food waste);<br>➢ Amenity sites (all types of waste, including bulky and hazardous waste);<br>➢ Green waste sites (green waste from gardens and city parks (including grass and leaves) etc.);<br>➢ Deposits (reusable and disposable beverage packaging);<br>• Other collecting systems (e.g. single or multiple social events).<br>Separate collection may be conducted using :<br>• Door to door bin/bag collection system from single houses and buildings with multiple flats;<br>• Bring-systems:<br>➢ Near the entrance to the building<br>✧ Flats with communal (i.e. shared) bins;<br>✧ Bins are very close to building entrance, or within communal areas within the building, or in attached bin stores (collection points);<br>➢ Bringing out to the street<br>✧ Communal containers serving multiple buildings in parking areas / on the side of the street.<br>Experience shows that, as a matter of convenience, the closer the collection bin is located to the point of origin, i.e. This is, first of all, the case for bio-waste.<br>To enforce recycling and source separation in households and similar establishments, an appropriate collection system for collection needs to be established. Source separation at the household level should be organized via a bin/bag system at least for following waste streams:<br>• recyclables including specific special waste streams such as packaging waste (metals, plastics, glass, paper and cardboard, wood);<br>➢ Covering glass and glass packaging waste<br>• bio-waste (organic garden and kitchen waste from households and garden green waste); and<br>• non-hazardous residual mixed municipal solid waste.<br>In order to enable further material recovery, the separated recyclables and packaging waste shall not be contaminated, e.g. with hazardous substances and/or food residues. Source separated bio-waste must not be contaminated, e.g. with packaging or non-organic materials. |
| **6.3.2 Public amenity sites (bring-system)**<br>In addition to the bin/bag collection system, a network of public amenity sites needs to be established in the territory of Serbia at the municipality level. Each municipality should provide at minimum one public amenity site to which defined waste streams, including hazardous waste from households, can be brought without charging citizens for the waste received at the amenity site. The takeover should be free of charge if the amount of waste is typical and comparable to the amount generated by households.<br>Following waste streams are covered to be received at public amenity sites:<br>• Bulky waste; |

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| • Green waste (e.g. from cuttings in gardens and parks, including grass and leaves);<br>• Packaging waste (including waste from special waste streams such as metals, glass, plastics, paper and cardboard, wood);<br>• Hazardous waste from households (including waste from special waste streams such as WEEE, used batteries and accumulators, waste oil, medical and pharmaceutical waste); and<br>• Properly packed small amounts of asbestos-containing waste (with small-scale storage possibility).<br>The collection system of hazardous household waste at public amenity sites will be equipped with containers for the collection of waste such as batteries, accumulators, small quantities of pharmaceutical waste, stained packaging from paints and varnishes, detergents, pesticides, waste oil, WEEE, tires, etc. The public amenity sites will be operated by trained staff. It needs to be ensured that all the waste collected at amenity sites is handed over only to registered and li-censed operators with valid permit to transport/treat the respective waste.<br>Amenity site construction must be started from 2020 in all municipalities as the first phase. Public amenity sites are established to a very low extent in 2017, and by 2032 in all municipalities public amenity sites should be established and operated.<br>Public amenity sites shall be located on closed and fenced areas and equipped with containers for non-hazardous (source separated) and hazardous household wastes (including WEEE, batteries and accumulators). Ideally all containers, at minimum those for hazardous wastes, needs to be placed under the roof in a lockable container or room. |
| **6.3.3 Home-composting in rural and semi-urban households**<br>In rural and semi-urban areas of dedicated waste management regions citizens and households shall be provided with knowledge for home-composting.<br>Therefore, targeted information campaigns to enable active participation of the public and citizens in rural and semi-urban areas shall be carried out. This may comprise an initial letter to the households with a leaflet and short description about how to establish and run a garden compost / equipment for home-composting and should be followed with training workshops in the neighborhoods including training on smart, biological gardening. Equipment for home-composting, including a brochure with a description about suitable materials/wastes and process steps to produce their own compost, shall be given to citizens who participated in the training workshop for free. For one household (two inhabitants, 0.06 - 0.1 ha) a composting container with a capacity of more than 700 liters is recommended. Trained compost masters from the municipalities or regional waste management companies/regions will offer advice to interested citizens. The introduced system shall be based on targeted information campaigns followed by detailed advice for interested citizens only. This will ensure that related costs are expended most efficiently.<br>• Home composting must be started from 2020 in all municipalities as the first phase. Home-composting shall be introduced in rural and semi-urban areas in all municipalities in all waste management regions until 2032. |
| **6.3.4 Composting**<br>**6.3.4.1 Small-scale composting facilities at municipal level**<br>Composting as a separate process is mainly understood as aerobic biological treatment for separate collected bio-waste waste from households and similar establishments (organic garden and vegetable kitchen waste from households), green waste (garden and park), and sludge from wastewater treatment plants. The compost can be used as a soil improver.<br>For optimal decomposition, input material must be a mixture of easily degradable, wet organic substances and structure-improving organic matter. Structure improving materials are needed to create structure with adequate air-filled porosity and a high number of pores in the pile when air conductivity is low. Moisture content is important to maintain microorganism activity; low moisture content can lead to microorganisms becoming dormant. If the moisture content becomes too high the porosity of materials is reduced and anaerobic conditions can flourish within the composting material. An optimum moisture content in the range of 40–65% has been reported in several studies and surveys.<br>In rural municipalities, the location of the composting facility may be situated near or next to the municipal amenity site or even at a suitable location in one of the parks. In city municipalities only, combined simple composting facilities for more than one municipality may be operated, taking into consideration the shortage and suitability of space. Hence, each municipality needs to decide to establish and operate its own composting plant at a suitable location or contract a partner for the service |

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| of composting. Produced compost may be used by the municipality administration and provided for citizens at special prices.<br>Depending on local climate, site conditions and total quantity treated, simple composting facilities may fulfil specific technical minimum requirements such as a sealed composting platform with controlled collection of surface and process water. The type of technique chosen for composting (an open/closed system, with or without active ventilation) needs to be decided considering the location (near housing areas) and the type and amount of wastes treated. Minimum machinery includes a wheel loader as well as a turning device for frequent turning and mixing of the waste, as well as a possibility of adding water in order to guarantee optimized rotting conditions during the treatment, as well for storage and transport of raw materials and compost.<br>The municipality administrations themselves generate a significant amount of organic waste. This comprises inter alia green waste from public garden and parks. To manage these waste streams together with source separated bio-waste (organic garden and vegetable kitchen waste from households), simple composting facilities for garden and park waste and bio-waste should be established in all municipalities. The capacities of the composting facilities at the municipal level shall be in the range of 500 to 5.000 t/year (small scale biological treatment plants).<br>It should be noted that in the case of composting plants intended to treat bio-waste of animal origin which is collected from households, operations should be subject to stricter requirements set in Commission Regulation (EU) No. 142/2011.<br>In such a case, the composting plant must be equipped with a closed composting reactor or closed area, which cannot be bypassed for the animal by-products or derived products introduced into the plant, and it must be equipped with the following:<br>• installations for monitoring temperature against time;<br>• recording devices to record, where appropriate continuously, the results of the monitoring measurements referred to in the first point;<br>• an adequate safety system to prevent insufficient heating.<br>Each composting plant must have its own laboratory or make use of an external laboratory. The laboratory must be equipped to carry out necessary analyses and be approved by the competent authority, be accredited according to internationally recognized standards, or be subject to regular controls by the competent authority.<br>In case bio-waste of animal origin from households is collected separately from that of vegetable origin, additional equipment enabling the production of a waste substrate for biogas production could be installed at the site.<br>It should also be noted that the treatment of bio-waste of vegetable origin from households which are collected separately should be subject to the hygiene requirements and standards for digestion residues and compost which are set in Commission Regulation (EU) No 142/2011. This should be done in the light of the fact that, when collecting vegetable origin kitchen waste from households, small quantities of animal origin kitchen waste are likely to enter the stream. |
| **6.3.5 Transfer stations / storage areas for interim storage**<br>In order to strengthen the management of waste streams which are not treated on-site or which are treated in centralized facilities with long transport distances, additional storage areas / transfer stations need to be established.<br>Operations carried out in waste transfer stations include transferring from small collection vehicles to big volume transport trucks, reception, bulking, sorting, and transferring pending, and prior to submission to a disposal/recovery/recycling operation. In some cases, blending and mixing may also be carried out in these installations. Waste transfer stations may involve individual operations or may be an integrated part of a treatment process. All sites typically under-take some kind of bulking operation to agglomerate the solids, where liquids are decanted from one container to another. The transfer of liquid can be from a tanker to a holding tank, or from a fraction of a liter up to a drum of more than 200 liters. The operations typically carried out are inspection, sampling, physical sorting and packaging, decanting, blending, drum emptying, storage, and in some cases the disposal of wiping cloths, solidification, and the crushing of oil filters. Waste transfer stations tend to fall into two categories according to the objective of the installation:<br>• Focus on the output stream. This corresponds to sites that act as a feeder for other processes: e.g. solvent regeneration, incineration, chemical treatment;<br>• Focus on the input waste. These sites are independent transfer stations and generally accept a full range of materials from the neighboring area. Typically, they also bulk and blend materials to |

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| produce a range of waste streams suitable for disposal through different treatment, recovery, and disposal processes, but they do not usually target any specific waste group.<br>The majority of operations linked to waste preparation may be distinguished under two groups:<br>• Regrouping/Reconditioning. Here the aim is to group together wastes in small or medium quantities, when they have the same nature and when they are compatible. The resulting waste still has to be treated, though. The purpose of regrouping is to obtain larger and more homogeneous volumes for waste treatment, to improve safety (e.g. facilitation of handling) and to rationalize the logistics cost. The combination of processes used in waste preparation and in pre-treatment operations depends on the specifications of final treatment;<br>• Pre-treatment. Here the aim is to adapt the waste to the type of recovery and/or disposal of the final treatment available. Pre-treatment covers several aspects. It can be defined as those operations that lead to homogenization of the chemical composition and/or physical characteristics of the wastes. Pre-treatment produces a waste, which may be very different from the initial waste, although not from a regulatory point of view. This pre-treated waste still has to be treated in a recovery and/or disposal plant.<br>Where economically feasible, transfer stations may be established to reduce transport costs and, in some cases, the number of vehicles passing inhabited settlements. Transfer stations are considered more as a possibility than a necessary element of the system. The number of transfer stations in each region must be defined during the technical assessment of future regional systems primarily as a function of the distances to landfill and the quantities of waste to be transported. Additional transfer stations may be developed in later phases if there is a change in circumstances.<br>• For construction and demolition waste, the establishment of storage areas / transfer stations at the municipal level is proposed, where mobile equipment may be operated. Given that the installation and maintenance of construction and demolition waste treatment system should be the responsibility of the market participants, it is the task for municipalities to foresee a place for the installation of such sites on the municipal territory when initiative for constructions comes from the private sector. Areas for such activities should be foreseen in the preparation of municipal spatial plans.<br>• The responsibility for the management of hazardous waste from production and other economic activities lies with the private sector. For hazardous waste, it is proposed that storage sites / transfer stations be established at the national level for five regions, where the minimum requirements to ensure environmentally safe handling of these wastes are ensured. The need and financial incentive for the private sector to invest in such activities should be formed through legislation to handle such waste and through inspection companies. It shall be necessary to introduce incentive measures for the participation of the private sector and to work on the development of partnerships between the public and private sector. Hazardous waste from the municipal sector should be collected via amenity sites.<br>• For non-hazardous waste, it needs to be assessed within the period 2020-2025 if storage areas / transfer stations are needed (e.g. for packaging and municipal solid waste). The assessment must take into consideration enforcement activities on introducing collection schemes and treatment capacities, as proposed in this WMS.<br>Storage areas/transfer stations may cover several different waste streams to be stored / transferred considering the technical minimum requirements and shall be equipped with suitable containers which are located on impermeable surfaces. Considering the potential of the stored waste type to damage the environment, the storage area should be equipped with a roof (at minimum for hazardous waste types) and the whole area should be closed and safe against unauthorized access. |
| **9. ORGANISATION OF WASTE MANAGEMENT, INCLUDING DIVISION OF RESPONSIBILITIES BETWEEN PUBLIC AND PRIVATE SECTOR IN THE AREA OF WASTE MANAGEMENT**<br>Waste management systems should be developed to cover the management of all waste except emissions into the air, waste water, radioactive waste, fallen stock, and agricultural waste (natural, non-hazardous, used in agriculture) as other substances that are listed in the Law on Waste Management, Article 4. Essentially, waste management systems can be divided into two parts:<br>• Management of municipal waste (post-consumer waste);<br>• Management of production waste and wastes from other economic activities.<br>The function of organizing municipal waste management is attributable to the responsibility of the public sector. According to Article 20 of the Law on Waste, it is the responsibility of the local self-government |

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| unit. In contrast, the management of production waste and waste from other economic activities is the responsibility of producers and entities engaged in economic activities. Public authorities shall establish the essential requirements for ensuring the safety of workers, the protection of the environment and human health from pollution produced by waste. Each economic entity and public authority, in accordance with these requirements, can choose the most appropriate ways or means of waste management.<br>One of the most important aspects of these two groups is the principle of the producer's responsibility for the environmental impact of the product, as the producer has the greatest influence on the formation of this effect when taking important decisions at the stages of product design and production process design and production. However, consumers play a major role in waste management systems. It is important to analyze the entire life cycle of a product and understand both of the main players, both the producer and the consumer, when developing waste management systems for individual waste types.<br>Another important aspect is to ensure the financial viability of systems. The costs of waste management, in accordance with the polluter pays principle, shall be borne by the holder of the waste and/or by the producer or importer of the materials and articles for which the waste is generated. To fully implement the polluter pays principle, the Rulebook on Adjusted Amounts for the Environmental Pollution Tax (*Official Gazette of the Republic of Serbia*, No. 43/17) establishes a tax for environmental pollution by waste products. |
| **9.1 Public sector**<br>In the field of waste management, the public sector generally carries out regulatory and service control functions. However, local self-government units also have to ensure the organization and implementation of the municipal waste management that is to create a system of municipal waste management in the territory.<br>A municipal waste management system is a set of organizational, technical, and legal measures related to the implementation of municipal functions in the field of waste management. It should cover household waste, as well as other waste, which is similar to household waste due to its nature or composition, and other waste generated in the territory of municipalities that are not included in production waste and wastes from other economic activities management systems.<br>Household waste that forms a high proportion of municipal waste must be managed in accordance with the requirements of waste management legislation; **all of their handling costs should not exceed 1.5 percent of the average family income**. Social policy must be implemented through social programs, not by means of waste management companies. |
| **9.2 Private sector**<br>As mentioned above, responsibility for the management of production waste and waste from other economic activities lies with the private sector.<br>The management of waste from production and other economic activities includes organizational and technical measures implemented by operators who have integrated pollution prevention and control permits or emission allowances that are prepared and issued in accordance with the procedures established by legal acts for the management of waste and/or the waste generated by the operation is not municipal waste. Therefore, this waste is not necessarily managed in the municipal waste management systems organized by the local authorities.<br>Production waste and wastes from other economic activities include industrial waste, including hazardous and biodegradable waste, construction and demolition, medical and pharmaceutical waste, sewage sludge, and other waste. The management of production waste and wastes from other economic activities at the state level is regulated by environmental and other normative documents, regulations on the management of specific waste flows, and permits issued for the operation of facilities.<br>Ensuring that waste from production and other economic activities is managed is a duty of economic operators, performed in accordance with the requirements and principles of the general waste management system and in co-operation with the operating waste managers.<br>The collection and sorting, packaging, labelling, accounting, storage, and transfer of waste from production and other economic activities shall be the responsibility of the waste handlers and/or holders who, in accordance with the polluter pays principle, must cover all waste management costs. |
| **10. SOURCES AND AMOUNTS OF FINANCIAL FUNDS FOR REALISATION OF ALL WASTE MANAGEMENT MEASURES**<br>**10.1 Currently available sources and financial funds dedicated to financing the waste measures** |

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| As an EU candidate country, Serbia is eligible to use IPA funds (Instrument for Pre-Accession Assistance). After accession to the EU, Serbia will be eligible to use EU Structural Funds, including the Cohesion Fund, which is the main source of EU grants for water/wastewater/waste infrastructure.<br>Capital investments in environmental infrastructure may be financed through various loan schemes, i.e. through the loans of international financial institutions (IFIs) and governments (bilateral loan actors), in the form of bilateral loans.<br>The Western Balkans Investment Framework (WBIF) is a regional blending facility supporting EU enlargement and socio-economic development in Serbia. The WBIF provides financing and technical assistance to strategic investments in the energy, environment, social, transport, and digital infrastructure sectors. It also supports private sector development initiatives.<br>Relatively small amounts (less than one million euros) are available from international donation.<br>The private sector can be an important source of capital investment financing and the transfer of technical and operational know-how (e.g. including public-private partnership arrangements in the utilities sector of the PUC and the realization of capital investments in the waste sector). Private sector funding is assumed for certain types of waste management projects, notably C&D and hazardous waste.<br>Comparing the total amount of public investments and expenditures for the current costs for environmental protection in 2016 and 2017, a significant turn to negative development is obvious. The share of investments decreased by about 52.6 million euros, which is half of the investments for 2016; in contrast, current cost expenditures increased about 44.6 million euros or +24% compared to 2016.<br>The situation in the waste management sector is slightly different, but the trend remains.<br>The 2018 report of the Fiscal Council of the Republic of Serbia calls for a strong increase in environmental protection investment as a budgetary priority in 2019 and beyond. One of the key suggestions of the Fiscal Council is that **it will be necessary to increase budget expenditures for environmental protection**, amounting to about 1.2 to 1.4% of GDP (about 500 million euros). This indicates that potentially in the future there could be a significantly larger fiscal space available in the budget that could be allocated for environmental infrastructure.<br>The average coverage of waste collection in 2016 was 82% in 2016. This might be an indication that some municipal waste is at risk of being managed outside of the municipal waste collection and disposal system. **Current charge rates are insufficient to provide the necessary investment in waste management infrastructure; they cover only the most urgent basic operational needs. The levels of cost recovery are currently low. In future, the principle of full cost recovery for the services of collection and disposing of waste should be applied.** |
| **10.2 Options for the financing of waste management measures**<br>In order to implement the envisaged measures, the country needs to ensure sufficient environmental funds available for related investments. Appropriate financing mechanisms and suitable economic incentives must also be in place to cover the operational costs of waste management activities in Serbia.<br>Financial instruments for future municipal waste management must seek to introduce and support high hierarchy waste management options at the least expensive cost. The approach includes the following measures:<br>**Municipal waste charges that are user charges are an important contribution for realizing the polluter pays principal and strengthening municipal waste management services.** Municipal waste charges have the potential to create incentives for waste minimization and better separation if they are implemented as unit-pricing models, where the rate varies with the amount and type of waste collected by individual households. Generally speaking, the strength of the incentive increases with a good balance of rates charged for different types of household waste (wet/dry; green/residual; packaging/non-packaging; recyclables/non-recyclables), and with the accuracy with which the rates charged are adapted to the volume collected. The most significant impact on waste generation and separated collection is coming from volume-based or weight-based systems of user charges, but the effect can also be ambiguous (see below: “pay-as-you-throw systems”).<br>Container subscription systems, where households can choose from different size containers (bins), also create a satisfying incentive for waste minimization and separation but are comparably easy to manage because they do not require elaborated measuring and accounting technologies. A pre-paid garbage bag model can accompany this system; it creates comparable incentives for waste reduction and is easy to manage in parallel. Pre-paid bag programs have been successfully implemented in large cities (e.g. Kyoto).<br>There is a potential trade-off between the strong environmental incentive effects of waste charges and the stability of revenues derived from them. The more accurately the charge adapts to the actual amount |

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| of waste collected, the more room there is for temporary revenue volatility when citizens decide to use illegal dumping. This trade-off can partially be overcome by introducing hybrid systems of waste charges, where one component is a flat-rate charge which covers part of the structural costs of waste management services and the other a variable part depending on the amount of waste collected. In order to maintain environmental incentives, however, the flat-rate charge should not be too high. In hybrid models, the basic charge can be adjusted to household income or property value. |

**10.3 Conclusions on financing of the proposed waste management options**

**Table 82: Options for financing long term infrastructure (Public sector)**

| **Establish an integrated system for municipal waste management throughout Serbia (MO1)** | | |
|---|---|---|
| **Waste management components** | **Description of options for financing waste management measures** | **Investment costs, Euros** |
| Establish a bin/bag collection system for separate collection of municipal waste covering 100% of the Serbian population. | Main source is fees from local budget. Can be co-financed from private sources in case of public-private partnership (PPP). | 104,931,346 (collection, containers, information campaigns) |
| Establish a network of amenity sites across the country for various municipal wastes including hazardous household wastes (at least one in each municipality). | A combination of national (public) and external sources. The main external source – IPA III. Can be co-financed from private sources in case of PPP. | 25,330,091 |
| Establish waste centers with appropriate separation lines for recyclable waste separation - in each waste management region. | A combination of national (public) and external sources. The main external source – IPA III. Can be co-financed from private sources in case of PPP. | 59,898,182 |
| Establish a waste-to-energy plant in Belgrade. | Construction of facility financed from private company Beo Clean Energy Ltd. Operational costs will be covered by the waste management tariff. According to the contract, the tariff will have to include investment costs and payed as fixed annual amount. | 190,000,000 |
| Establish a sanitary landfill in each Serbian waste management region | A combination of national (public) and external sources. The main external source – IPA III. Can be co-financed from private sources in case of PPP. | 139,075,316 |
| Construct small composting capacities (composting lines) for composting organic municipal waste. | A combination of national (public) and external sources. The main external source – IPA III. Can be co-financed from private sources in case of PPP. | 35,801,894 |
| Introduce home composting in rural regions. | A combination of national (public) and external sources. The main external source – IPA III. | 27,362,084 (containers, information campaigns) |
| **Close non-compliant landfills and dumpsites (MO2)** | | |
| Ceasing of landfill operation of all non-compliant landfills and dumpsites. | A combination of national (public) and external sources. The main external source – IPA III. Can be co-financed from private sources in case of PPP. In case the **Environmental Protection Fund** (**Green Fund**) is re-established the funds raised could be used as instrument to co-finance the remediation of historically | 2,369,600 |
| Re-cultivation of the closed landfills and dumpsites. | | 244,589,892 |

| Clause | | |
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| | contaminated sites and the disposal/treatment of historical hazardous waste stockpiles.<br>It is foreseen that regions under PPP will be supported for the second phase closure–re-cultivation, but not for the first phase closure. In addition, it is expected that only main landfills will be eligible for central level support for financing, namely 141 official municipal landfills as well as dumpsites larger than 10,000 $m^3$, which pose a risk for the environment or human health. The rest shall be taken care by municipalities using local resources. | |

**12. MEASURES AND GUIDELINES FOR IMPLEMENTATION OF THE NATIONAL PLAN**

**12.1 General waste management measures**

**12.1.2 Establish an integrated system for municipal waste management throughout Serbia**

The integrated system for municipal waste management will be constituted by the following elements:

- Separate collection of recyclables through the establishment of (at least) a two bin/bags collection system — one for mixed municipal solid waste and the other for recyclable waste — covering 100% of the Serbian population; collective schemes implementing EPR shall have clearly defined geographical, product, and material coverage, without limiting these areas to where the collection and management of waste are the most profitable, shall provide an appropriate availability of waste collection systems, and have the necessary financial or financial and organizational means to meet its EPR obligations;
- Introduction of secondary separation of recyclables through the establishment of regional waste centers with appropriate separation lines for recyclable waste separation — in each waste management region;
- Establishment of separate collection of municipal bio-waste (third bin) and green waste;
- Establishment of a network of amenity sites across the country: Depending on the population density, one or several such sites in each municipality will be established. These sites will be operated as “bring centers” for citizens to dispose of waste that should not be disposed of in the household bins, including e.g. bulky waste, special waste streams, green waste, household hazardous waste, waste electrical and electronic equipment;
- Construction of small composting lines for composting of organic municipal waste including provision of appropriate vehicles for transport;
- Establishment of home composting in rural regions, in order to recycle organic waste from households;
- Construction of a mechanical-biological treatment plant for municipal waste in three waste management regions;
- After assessing impact of first phase infrastructure, development of treatment of bio-waste by constructing large scale facilities for biological treatment of source separated bio-waste;
- Establishment of a municipal waste incineration plant for residual municipal waste in Belgrade with an incineration capacity of 340,000 tonnes, an installed power production capacity of 25 MW and a heat production capacity of 56 MW. Completion of construction is foreseen in 2021;
- Establishment of a sanitary landfill in each waste management region where it does not yet exist; and
- Closure of non-compliant landfills and dumpsites.

**12.1.3 Conduct information campaigns related to waste management for citizens (including municipal waste)**

Carry out comprehensive information campaigns in order to establish a system for municipal waste management

a) Source separation of wastes at household level

Awareness raising campaigns on source separation of specific wastes from households and similar establishments covering hazardous waste (including pharmaceutical waste and medical waste) and bio-

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| waste (including food and garden waste), as well as further recyclables (such as plastics, metals, wood, glass, paper and cardboard), shall be conducted on different levels.<br>Households shall be informed about the related needs and possibilities of the system in place. This includes information on the location, type, labelling, and size of the containers (and related amenity sites) available in the surroundings of the settlement and the types of waste covered by each container type. In addition, information on the further use of the source separated materials shall be provided to the citizens in order to reflect the benefits resulting from the activity of source separation.<br>The frequency with which containers are emptied and a contact point to be consulted in case of questions/problems shall be part of continuous exchange with citizens.<br>If take-back systems or free take-back possibilities are installed for specific fractions (such as drinking bottles, pharmaceutical waste, batteries) even on a voluntary basis, these shall be described in detail and concerned companies/shops shall be involved in conducting the campaigns.<br>The campaigns on source separation shall be addressed inter alia to schools and all the educational levels in order to inform young/interested people on current waste management systems. Training courses as an integral part of educational programmers need to be introduced. Brochures and training courses shall also be carried out at the public level involving housing/flat rental organizations.<br>Commercial spots in radio and TV may be an additional instrument to be conducted in order to enable broad notice of newly launched initiatives/systems on source separation.<br>b) Home-composting at household level<br>In rural and semi-urban areas of dedicated waste management regions, citizens and households shall be provided with knowledge for home-composting. Therefore, targeted information campaigns to enable active participation of the public and citizens in rural and semi-urban areas shall be carried out. This may comprise an initial letter to the households with a leaflet and short description of how to establish and run a garden compost / equipment for home-composting and should be followed with training workshops in the neighborhoods, including training on smart, biological gardening. Equipment for home-composting, including a brochure with a description of suitable materials/wastes and process steps to produce their own compost, shall be given for free to citizens who participated in the training workshop. Trained compost masters from the municipalities or regional waste management companies/regions will offer advice to interested citizens. The introduced system shall be based on targeted information campaigns followed by detailed advice for interested citizens only. This will ensure that related costs are expended most efficiently. |

### 1.2.3 Law on the Protection of the Environment

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| **Waste management**<br>**Article 30**<br>Waste management shall be enforced according to the regulated conditions and measures treatment through system of collecting, transport, treatment and disposal of waste, including supervision of those activities and concern for waste management facilities after their closure.<br>**The owner of the waste is obliged to take waste management measures in order to prevent or reduce waste generation, reuse and recycling of waste, separation of secondary raw materials and use of waste as energents, i.e. waste disposal.** |

### 1.2.4 Law on Ministries (ORGS, no. 44/14, 14/15, 54/15, 96/15, 62/17)

| Clause |
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| **Ministry of Environmental Protection***<br>***Official Gazette of RS, No. 62/2017**<br>**Article 5a***<br>The Ministry of Environmental Protection performs state administration tasks related to:<br>• **waste management, excluding radioactive waste;** |
| **The Environmental Protection Agency**, as an administrative body within the Ministry of Environmental Protection, with the status of a legal entity, performs state administration tasks related to: |

| Clause |
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| • keeping data on the best available techniques and practices and their application in the field of environmental protection; |

### 1.2.5 Law on Local Self-Government (ORGS, no.129/07, 83/14)

| Clause |
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| **Article 7**<br>A unit of local self-government may found enterprises, institutions and other organizations that perform public service, in order to exercise its rights and duties and to meet the needs of the local population, in accordance with the law and the statute. |
| **2. Legal status of the local self-government unit**<br>**2.1. Municipality**<br>**Article 18**<br>A municipality is a basic territorial unit in which local self-government is exercised, which is capable of independently performing all rights and duties within its competence through its bodies and has at least 10,000 inhabitants. |
| **2.1.1. Competence of the municipality**<br>**Article 20**<br>The municipality, through its bodies, in accordance with the Constitution and the law:<br>5) regulates and ensures the performance and development of communal activities (water purification and distribution, purification and drainage of atmospheric and wastewater, production and supply of steam and hot water, regular urban and suburban transport of passengers by road, maintaining cleanliness in cities and towns, maintenance and management landfill, maintenance and use of markets, parks, greenery, recreational and other public areas, public parking lots, public lighting, arrangement and maintenance of cemeteries and burials, etc.), as well as organizational, material and other conditions for their performance; |
| 11) takes care of environmental protection, adopts programs for the use and protection of natural recources and environmental protection programs, ie local action and remediation plans, in accordance with strategic documents and its interests and specifics and determines special compensation for environmental protection and improvement; |
| **Article 24**<br>The city, in accordance with the law, forms the communal police, provides and organizes the performance of communal police tasks. |
| **Article 32**<br>Municipal Assembly, in accordance with the law:<br>8) establishes services, public enterprises, institutions and organizations, determined by the statute of the municipality and supervise their work; |

### 1.2.6 Statute of the Autonomous Province of Vojvodina ("Official Gazette of AP Vojvodina", No. 20/2014)

| Clause |
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| **Cooperation with local self-government units**<br>**Article 15**<br>AP Vojvodina, in performing tasks within its competence, achieves cooperation and coordination with local self-government units on its territory. |
| **Article 27**<br>**AP Vojvodina is responsible for performing the following tasks:**<br>5. Environmental protection<br>- performs systematic monitoring of environmental factors with monitoring and assessment of the development of environmental pollution;<br>- regulates other issues of provincial importance in the field of environmental protection in accordance with the law; |
| **The position of the provincial administration**<br>**Article 55** |

| Clause |
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| The Provincial Administration is independent and performs the tasks within its competence in accordance with the Constitution, law, the Statute and the Provincial Assembly decision, and is responsible for its work to the Provincial Government and the Assembly. |

### 1.2.7 Law on Public Enterprises ("Official Gazette of RS", No. 15/2016 and 88/2019)

| Clause |
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| **3. The concept of public enterprise and other forms of organization**<br>**Article 3**<br>2) a capital company whose sole owner is the Republic of Serbia, an autonomous province, a unit of local self-government, as well as a subsidiary whose sole owner is that capital company; |
| **II PURPOSE OF ESTABLISHMENT, ESTABLISHMENT AND OPERATION OF A PUBLIC ENTERPRISE**<br>**1. The goal of founding a public company**<br>**Article 4**<br>Public enterprise and capital company referred to in Article 3, paragraph 2, item 1) and 2) of this Law shall be established and operate for the purpose of:<br>1) ensuring the permanent performance of activities of general interest and regular satisfaction of the needs of users of products and services;<br>2) development and improvement of performing activities of general interest;<br>3) ensuring the technical-technological and economic unity of the system and the harmonization of its development;<br>4) gaining profit;<br>5) realization of another interest determined by law. |
| **2. Establishment of a public company**<br>**Article 5**<br>If a public enterprise is established by a unit of local self-government, the act on the establishment of a public enterprise is passed by the assembly of the unit of local self-government, which exercises the rights of the founder. |
| **16. Profit distribution**<br>**Article 58**<br>Public enterprise and capital company referred to in Article 3, paragraph 2, item 1) and 2) of this Law shall be obliged to pay a part of the realized profit to the budget of the Republic of Serbia, autonomous province or local self-government unit, according to the final account for the previous year.<br>The amount and deadline for payment of the profit referred to in paragraph 1 of this Article shall be determined by law, ie by the decision on the budget for the following year. |

### 1.2.8 Law on Local Government Financing (ORGS, no.62 / 06, 47/11, 93/12, 83/16, 104/16)

| Clause |
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| **1. Source revenues of the local self-government unit**<br>**Article 6**<br>The local self-government unit belongs to the original revenues generated on its territory, as follows:<br>1) property tax, except for tax on transfer of absolute rights and tax on inheritance and gift;<br>2) local administrative fees;<br>3) local utility fees;<br>4) sojourn tax;<br>5) fees for the use of public goods, in accordance with the law;<br>6) concession fee;<br>7) other fees in accordance with the law;<br>8) revenues from fines imposed in misdemeanor proceedings for misdemeanors prescribed by an act of the assembly of a local unit self-government, as well as confiscated property gain in that procedure; |

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| 9) income from leasing, ie the use of real estate and movable property owned by the Republic of Serbia, which is used local self-government unit, ie bodies and organizations of the local self-government unit and indirect users of its budget;<br>10) revenues from leasing, ie the use of real estate and movables owned by the local self-government unit;<br>11) revenues generated from the sale of services of users of budget funds of the local self-government unit whose provision has been agreed with natural and legal persons;<br>12) income from interest on budget funds of the local self-government unit;<br>13) revenues from donations to local self-government units;<br>14) income from self-contribution |
| **2. Revenues from other levels of government**<br>**Types of income from other levels of government**<br>**Article 34**<br>Local self-government units from the level of the Republic belong to:<br>1) **assigned revenues;**<br>2) **transfers** |
| **Article 41**<br>All local self-government units have the right to a general transfer.<br>The total amount of funds for the general transfer is obtained when the required amount is deducted from the total amount of the non-earmarked transfer equalization transfer and compensatory transfer. |
| **Article 42**<br>Determining the basis for calculating the amount of general transfer by individual units of local self-government is done on the basis unique criteria, namely:<br>- **65.0% of the total amount of funds allocated for general transfer is divided according to the number of inhabitants**, whereby the amount transfers per capita is calculated by dividing the amount of the general transfer by number population, divided by the total number of inhabitants, according to the data of the republic body in charge of statistics from the last census;<br>- **19.3% is divided according to the area of the territory**, where the amount of transfer per one square kilometer of area is calculated so that the amount of the general transfer intended for distribution by area is divided by the total area of the local units self-government, according to the data of the republic body in charge of statistics;<br>- **4.56% is divided according to the number of classes in primary education**, where the amount of transfer per one class is calculated by dividing the amount of the general transfer intended for distribution according to the number of classes in primary education by the total number of departments according to the data of the ministry in charge of education;<br>- **1.14% is divided according to the number of facilities in primary education**, where the amount of transfer per facility is calculated by dividing the amount of the general transfer intended for distribution according to the number of facilities in primary education by the total the number of facilities, according to the data of the ministry in charge of education;<br>- **2.0% is divided according to the number of departments in secondary education**, where the amount of transfer per department is calculated by dividing the amount of the general transfer intended for distribution according to the number of classes in secondary education by the total the number of departments, according to the data of the ministry in charge of education;<br>- **0.5% is divided according to the number of facilities in secondary education**, where the amount of transfer per facility is calculated as follows that the amount of the general transfer intended for distribution according to the number of facilities in secondary education is divided by the total the number of facilities, according to the data of the ministry in charge of education;<br>- **6.0% is divided according to the number of children covered by direct child protection**, especially for children in full-time, ie half-day stay, where the total amount of the transfer intended for the financing of children covered by the immediate child protection is divided into two parts: the part for financing the stay of children in full-time or half-day stay, in proportion to the cost price in these two types of stay, and the amount of transfer per child in a full-day or half-day residence, is determined by dividing the corresponding part of the transfer with the total number of children in the full-time, ie half-day stay, according to the data of local self-government units; |

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| - 1.5% is divided according to the number of facilities in child protection, where the amount of transfer per one facility is calculated by the amount of the general transfer intended for distribution according to the number of facilities in child protection, divided by the total number of facilities, according to the competent ministry. |

### 1.2.9 Business program of JKP "Srem-Macva" Sabac for 2019

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| **1. MISSION, VISION, GOALS**<br>**1.1. Mission**<br>On November 10, 2006, the City of Sremska Mitrovica and the City of Sabac concluded a Cooperation Agreement related to the establishment of a municipal solid waste management region, based on the National Waste Management Strategy adopted by the Government of the Republic of Serbia in 2003 as a basic state document which provided conditions for the rational and sustainable waste management at the level of the Republic of Serbia.<br>Based on the Agreement, on March 25, 2011, the two cities concluded an Agreement on the construction, management and use of a regional system for municipal solid waste management in the territories of the two cities. The agreement stipulates that the regional system consists of a sanitary landfill "Jarak" with accompanying infrastructure, a transfer station in Sabac and a waste separation plant at the regional landfill. During 2014, the Agreement on construction, management and use of the regional system for solid municipal waste management on the territory of the City of Šabac and the City of Sremska Mitrovica was amended. |
| The market in which the joint venture performs activities in the field of municipal waste management includes the entire population of the two founding cities - Sremska Mitrovica with 85,000 inhabitants and Sabac with about 116,000 inhabitants. In the future, in accordance with the Regional Waste Management Plan, the inclusion of other municipalities of Srem and Macva districts is envisaged, which will significantly increase the market of the joint venture in the coming years (Municipality of Sid and Municipality of Bogatic primarily). |
| PUC Regional Landfill "Srem-Macva" started landfilling on August 14, 2014. |
| **1.2. Vision**<br>The project of the regional waste management system envisages its construction in two phases.<br>The first phase of development of the regional waste management system includes the construction of a sanitary landfill cassette, leachate treatment plants and other ancillary facilities required for waste disposal, with the construction of a transfer station for waste preparation and transport from Sabac. All of the above was built in the period 2011-2012 with European Union funds intended for the development of local government infrastructure in Serbia, through the IPA 2008 program, and through co-financing with the Republic Eco Fund, as well as budget funds of the founding cities. |
| The development of the company in the future should include other types of waste treatment, in addition to its disposal and compaction on the landfill cassette. The second phase of the regional system in the future will include, in addition to the construction of the next sanitary landfill cassette, the construction of a waste separation line and a composting plant for biodegradable waste treatment, which will complete all waste treatment processes before landfilling. During 2015, the competent Ministry of the Republic of Serbia allocated funds for the construction of the separation line, which is in the implementation phase during 2018, and is expected to be completed and handed over for use in 2019. |
| Waste selection at the place of origin is the best way of waste treatment that can be carried out by the users themselves, by disposing of "dry" and "wet" waste separately, i.e. by disposing of recyclable waste fraction ("dry" waste) and microbiological active waste ("wet" waste) separately in two containers. active waste ("wet" waste). Such primarily selected waste would be delivered to the landfill for further treatment at the waste separation plant, where the "dry" fraction would be further treated, ie its separation into constituent components - paper, cardboard, metal, plastic, rubber, textiles and glass . |
| Composting is the final treatment of biodegradable, ie microbiologically active waste (food waste, yard waste and other waste of organic origin) which will be delivered to the location of the regional landfill as a "wet" fraction of municipal waste for further processing. The future construction of the composting plant will realize the presuppose the production of compost as fertilizer, ie organic |

<table>
<tr><th>Clause</th></tr>
<tr><td>matter that serves to improve the soil in horticulture and agriculture, as well as the reclamation of the old landfill and the closure of the new sanitary landfill.</td></tr>
<tr><td>Precisely by separating recyclable fractions from waste and producing compost, preconditions will be created for making a profit by performing the basic activity of the company, because it will be possible to offer products to the wider market that will result from this way of waste management.</td></tr>
<tr><td>4.1. Planned activities in 2019<br>In 2019, the company will achieve operational capacity through the disposal of constructed facilities, procured equipment and employment of professional staff, which will meet all the necessary standards required for the activities for which the company is registered.<br>The planned performance of the service of receiving, transshipment, transport and disposal of garbage in 2019, with indicators from 2018, is shown in the following table:
<table>
<tr><th>Service name</th><th>Unit</th><th>Plan 2018</th><th>Estimate 2018</th><th>Plan 2019</th></tr>
<tr><td>Reception and disposal of municipal waste from the territory of the city of Sremska Mitrovica</td><td>t</td><td>20,300</td><td>19,900</td><td>22,000</td></tr>
<tr><td>Reception, transshipment, transport and disposal of municipal waste from the territory of the city of Sabac</td><td>t</td><td>31,000</td><td>30,900</td><td>22,500</td></tr>
<tr><td>Receipt of municipal waste by legal entities</td><td>t</td><td>2,000</td><td>1,100</td><td>2,700</td></tr>
<tr><td>Sale of secondary raw materials to legal entities that are registered for that</td><td>t</td><td>100</td><td>72</td><td>100</td></tr>
<tr><td>Total disposal of municipal waste</td><td>t</td><td>53,400</td><td>51,972</td><td>58,300</td></tr>
</table>
10. PRICES<br>The company will generate its own revenues in 2019:<br>- collection of waste disposal fees from the competent local utility companies, in charge of the collection of solid municipal waste on the territory of the founder,<br>- collection of waste disposal fees from other legal entities and individuals.<br>- By selling secondary raw materials to registered purchasers, the amount of the waste disposal fee, which will be charged from local utility companies, is determined in this Business Program of the company.<br>Fees for disposal from other legal entities and individuals, as well as for various types of waste that can be deposited, but do not have the characteristics of municipal waste (construction debris, green waste, bulky waste, etc.), will be determined by the price list of PUC "Srem-Macva" Sabac, which will be brought by the Supervisory Board of the company. The waste disposal fee will include the calculated total operating costs of the waste disposal company and the costs of depreciation of facilities and equipment. Adoption and application of the price list of services, as well as invoicing of the waste disposal service, is done after the monthly service provided.</td></tr>
</table>

### 1.2.10 Law Related with Packaging and Packaging Waste

<table>
<tr><th>Clause</th></tr>
<tr><td>II. ENVIRONMENTAL PROTECTION CONDITIONS WHICH PACKAGING MUST MEET TO BE PLACED ON THE MARKET<br>Placing on the market<br>Article 7<br>Packaging may be placed on the market provided that it meets the basic requirements relating to the production and composition of packaging, its reuse and reuse, including the suitability of packaging for recycling.</td></tr>
<tr><td>Specific requirements for packaging that is reusable by recycling materials<br>Article 12</td></tr>
</table>

| Clause |
| --- |
| Packaging must be designed and manufactured in such a way that when it becomes packaging waste it enables the recycling of materials used in the production of that packaging in a certain percentage by weight. **The values of the mass estimates depend on the packaging material.** |

# 2 Study on Organizations and Institutions of C/P

## 2.1 Laws Relevant to the Organization Reviewed

| No | Document name |
|---|---|
| 1 | Law on ministries |
| 2 | Statute of Autonomous Province of Vojvodina |
| 3 | Law on local self-government |
| 4 | Law on Public Enterprises |
| 5 | Law on government |
| 6 | Law on employees in autonomous provinces and local self-government. |
| 7 | Law on Public Agencies |
| 8 | Law on Amendments to the Law on Public Agencies |
| 9 | Informatory on the Work of the Provincial Government-Vojvodina |
| 10 | Role of Ministry of Environmental Protection |
| 11 | Role of Environmental Protection Agency |
| 12 | Statute of the Municipality of ŠID |
| 13 | PUC-Rules on Organization and Systematization of Business and General Provisions |
| 14 | Rev-PUC-Rules on Organization and Systematization of Business and General Provisions |
| 15 | Statute of Public Utility Company STANDARD ŠID |

## 2.2 Business of PUC Standard SID

| Description | Contents |
|---|---|
| **Public utility business**<br>**Mainly removal and disposal of household and industrial wastes** | • Collection of non-hazardous wastes<br>• Treatment and disposal of non-hazardous waste<br>• Dismantling of wreckage<br>• Reuse of sorted materials<br>• Rehabilitation, reclamation and other services in the field of waste management<br>• Other cleaning services for buildings and facilities<br>• Other cleaning services<br>• Animal hygiene activities |
| **Urban Greening**<br>**Provides services for the maintenance and management of green spaces. Maintenance of parks, boulevards, and green oases; arrangements for flower beds, roads, gardens, cemeteries, etc.** | • Maintenance of streets and roads<br>• Maintaining the cleanliness of public places<br>• Maintenance of public green spaces |
| **Markets and Fairs**<br>**The market in Sid is located in the city center, the fair is held on the 15th of every month in "Vasharishte"** | • Market Management |
| **Parking services**<br>**Maintenance and collection of fees for parking in three zones** | • Manage public parking lots |
| **Funeral services** | • Provide funeral services<br>• Cemetery management and funeral services |
| **Chimney sweeping service**<br>**Cleaning, upkeep and maintenance of flue and firebox equipment in authorized zones** | • Chimney sweeping services |

| Description | Contents |
|---|---|
| **Others** | • Management of economic entities<br>• Business and other management consultancy activities<br>• Engineering activities and related technical consultancy<br>• Technical testing and analysis<br>• Wholesale and retail of other intermediate products<br>• Wholesale of waste and scrap<br>• Road freight transportation<br>• Warehousing<br>• Service activities in land transportation<br>• Support activities for animal production<br>• Other personal service activities |

Source: PUC Standard SID

# 3 Financial Data

## 3.1 List of Finance-related Laws Reviewed

| No | Document name (ENG) |
|---|---|
| 1 | Law on local government financing |
| 2 | Law on budget system |
| 3 | Law on public procurement |
| 4 | Law on salaries and employees in autonomous province and local self-government |
| 5 | Law on the Budget of the Republic of Serbia for 2021 |

## 3.2 Budgets for IPA project for Serbia provided by the MEP

| IPA year | Project Name | User name | co-financing / pre-financing | European Union funds |
|---|---|---|---|---|
| **IPA 2008 first component** | IPA 2008 - Support to the introduction of a decentralized management system of EU funds | MINISTRY OF FINANCE | 141,001,000 | |
| **IPA 2008 first component total** | | | 141,001,000 | |
| **IPA 2010 first component** | IPA 2010 - Support to Municipalities in the Republic of Serbia in preparation and implementation of infrastructure projects (MISP 2010) | MINISTRY OF ENVIRONMENTAL PROTECTION | 65,502,000 | |
| **IPA 2010 first component in total** | | | 65,502,000 | |
| **IPA 2013** | IPA 2013 - Energy sector | MINISTRY OF MINING AND ENERGY | 10,080,000 | 90,720,000 |
| | IPA 2013 - Support for modernization of customs administration and improvement of border management | CUSTOMS BUREAU | 370.000 | 3,330,000 |
| | IPA 2013 - Justice Sector | CRIMINAL SANCTIONS ADMINISTRATION | 23,005,000 | 39,877,000 |
| | IPA 2013 - Public Administration Reform | PUBLIC PROCUREMENT OFFICE | 13,204,000 | 118,835,000 |
| | | MINISTRY OF FINANCE | 2,461,000 | 134,161,000 |
| | IPA 2013 - Environment and Climate Change | MINISTRY OF ENVIRONMENTAL PROTECTION | 49,977,000 | 75,824,000 |
| | | MINISTRY OF MINING AND ENERGY | 8,894,000 | 80,045,000 |
| | IPA 2013 - Transport sector | DIRECTORATE FOR WATERWAYS | 92,054,000 | 297,183,000 |
| | IPA 2013 - Support to European integration and project preparation for 2014 - 2020 | MINISTRY OF EUROPEAN INTEGRATION | 23,520,000 | 45,090,000 |
| | IPA 2013 - PROGRESS | MINISTRY OF HEALTH | 475.000 | 2,688,000 |

| IPA year | Project Name | User name | co-financing / pre-financing | European Union funds |
|---|---|---|---|---|
| | IPA 2013 - Social Development | MINISTRY OF CONSTRUCTION, TRANSPORT AND INFRASTRUCTURE | 1,656,000 | 31,975,000 |
| | | MINISTRY OF LABOR, EMPLOYMENT, VETERANS AND SOCIAL ISSUES | 14,182,000 | 127,624,000 |
| | IPA 2013 - Social Development 2 | MINISTRY OF LABOR, EMPLOYMENT, VETERANS AND SOCIAL ISSUES | 9,226,000 | 83,026,000 |
| **IPA 2013 total** | | | 249,104,000 | 1,130,378,000 |
| **IPA 2014** | IPA 2014 - Home Affairs Sector | COMMISSIONER FOR REFUGEES AND MIGRATION | 12,000,000 | 122,214,000 |
| | | MINISTRY OF INTERIOR | | 78,457,000 |
| | | CUSTOMS BUREAU | 21,906,000 | 77,415,000 |
| | IPA 2014 - Public Administration Reform | MINISTRY OF STATE ADMINISTRATION AND LOCAL SELF-GOVERNMENT | 378.000 | 37,119,000 |
| | IPA 2014 - Competitiveness Sector | MINISTRY OF ECONOMY | 7,799,000 | 70,187,000 |
| | | MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGICAL DEVELOPMENT | 58,538,000 | 73,172,000 |
| | | MINISTRY OF TRADE, TOURISM AND TELECOMMUNICATIONS | | 12,000,000 |
| | IPA 2014 - Sector for Support of Youth Employment and Active Inclusion | MINISTRY OF CONSTRUCTION, TRANSPORT AND INFRASTRUCTURE | 20,375,000 | 183,367,000 |
| | | MINISTRY OF LABOR, EMPLOYMENT, VETERANS AND SOCIAL ISSUES | 10,231,000 | 110,066,000 |
| | | MINISTRY OF YOUTH AND SPORTS | 7,493,000 | 67,432,000 |
| | | MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGICAL DEVELOPMENT | | 63,515,000 |
| | IPA 2014 - Lifelong Learning Sector | MINISTRY OF YOUTH AND SPORTS | 1,080,000 | 6,461,000 |
| | | MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGICAL DEVELOPMENT | | 302,278,000 |
| | IPA 2014 - Energy sector | MINISTRY OF MINING AND ENERGY | 10,362,000 | 93,251,000 |

| IPA year | Project Name | User name | co-financing / pre-financing | European Union funds |
|---|---|---|---|---|
| | IPA 2014 - Assistance to European integration - unallocated funds | MINISTRY OF AGRICULTURE, FORESTRY AND WATER MANAGEMENT | | 13,680,000 |
| | IPA 2014 - Support to European integration and preparation of projects for 2014-2020 unallocated funds | MINISTRY OF ENVIRONMENTAL PROTECTION | | 144,000,000 |
| | IPA 2014 - Assistance to EU accession | MINISTRY OF EUROPEAN INTEGRATION | 19,058,000 | 190,580,000 |
| | | MINISTRY OF FINANCE | | 29,181,000 |
| **IPA 2014 total** | | | 169,220,000 | 1,674,375,000 |
| **IPA cross-border cooperation** | IPA cross-border cooperation program Bulgaria - Serbia - technical assistance | MINISTRY OF EUROPEAN INTEGRATION | 19,120,000 | 22,920,000 |
| | IPA cross - border cooperation program Romania - Serbia - technical assistance | MINISTRY OF EUROPEAN INTEGRATION | 25,190,000 | 29,400,000 |
| | IPA cross-border cooperation program Hungary-Serbia - technical assistance | MINISTRY OF EUROPEAN INTEGRATION | 11,935,000 | 1,955,000 |
| | IPA cross-border cooperation program Croatia-Serbia - technical assistance | MINISTRY OF EUROPEAN INTEGRATION | 17,340,000 | 12,940,000 |
| | Danube Transnational Program - Technical Assistance | MINISTRY OF EUROPEAN INTEGRATION | 7,130,000 | 7,670,000 |
| | Adriatic Ionian Transnational Program - Technical Assistance | MINISTRY OF EUROPEAN INTEGRATION | 3,520,000 | 4,265,000 |
| | IPA cross-border cooperation program Hungary-Serbia | MINISTRY OF FINANCE | 4,101,000 | 2,100,000 |
| | Danube Transnational Program 2014-2020 | MINISTRY OF CONSTRUCTION, TRANSPORT AND INFRASTRUCTURE | 5,790,000 | |
| | | REPUBLIC HYDROMETEOROLOGICAL INSTITUTE | | 1,295,000 |
| | | CULTURAL INSTITUTIONS | 6,790,000 | |
| | IPA cross-border cooperation program Serbia - Montenegro and Serbia - Bosnia and Herzegovina - technical assistance 2014-2020 | MINISTRY OF EUROPEAN INTEGRATION | 2,007,000 | 46,410,000 |

| IPA year | Project Name | User name | co-financing / pre-financing | European Union funds |
|---|---|---|---|---|
| | IPA cross-border cooperation program Serbia - Macedonia - technical assistance 2016-2020 | MINISTRY OF EUROPEAN INTEGRATION | 980.000 | 10,103,000 |
| | IPA Cross-Border Cooperation - Focal Point - Support to the Management of the Macro-Regional Strategy for the Adriatic-Ionian Region | MINISTRY OF EUROPEAN INTEGRATION | 9,820,000 | 10,560,000 |
| | Program "Intereg" IPA - CBC Romania - Serbia | MINISTRY OF HEALTH | 82,042,000 | 8,020,000 |
| | IPA cross-border cooperation program Serbia - Montenegro - To be ready | MINISTRY OF INTERIOR | 5,620,000 | 10,751,000 |
| | Support to the Serbian presidency of the EU strategy for the Adriatic-Ionian region | MINISTRY OF EUROPEAN INTEGRATION | 1,300,000 | 12,000,000 |
| | IPA - Safer cross-border area through improved emergency response and joint training | MINISTRY OF INTERIOR | 40,945,000 | 58,575,000 |
| | IPA Safer climate in the Romanian - Serbian cross - border area | MINISTRY OF INTERIOR | 72.000 | 45,900,000 |
| | IPA Cross-Border Cooperation - Preparing the Population for Disaster Action and Improving the Capacity of Emergency Response Teams in the Bulgarian-Serbian Cross-Border Region | MINISTRY OF INTERIOR | 1,337,000 | 44,186,000 |
| **IPA cross-border cooperation in total** | | | 245,039,000 | 329,050,000 |
| **IPA membership fees** | IPA Support for participation in EU programs | MINISTRY OF EUROPEAN INTEGRATION | | 64,892,000 |
| | | MINISTRY OF HUMAN AND MINORITY RIGHTS AND SOCIAL DIALOGUE | 1.000 | |
| | | MINISTRY OF CULTURE AND INFORMATION | 60,500,000 | |
| | | MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGICAL DEVELOPMENT | 2,000,000,000 | |

| IPA year | Project Name | User name | co-financing / pre-financing | European Union funds |
|---|---|---|---|---|
| | | TAX ADMINISTRATION | 13,000,000 | 12,000,000 |
| | | CUSTOMS BUREAU | 15,990,000 | 15,000,000 |
| **IPA membership fees in total** | | | 2,089,491,000 | 91,892,000 |
| **IPA 2015** | IPA 2015 Traffic | MINISTRY OF CONSTRUCTION, TRAFFIC AND INFRASTRUCTURE | 565,279,000 | 284,370,000 |
| **IPA 2015 total** | | | 565,279,000 | 284,370,000 |
| **IPA 2016** | IPA 2016 - Support in the form of a twinning project | MINISTRY OF TRADE, TOURISM AND TELECOMMUNICATIONS | 4,680,000 | 17,962,000 |
| | | REPUBLIC WATER DIRECTORATE | | 18,000,000 |
| | IPA 2016 Support for the visibility of EU aid | MINISTRY OF CONSTRUCTION, TRANSPORT AND INFRASTRUCTURE | 55,500,000 | |
| | IPA 2016 - unallocated funds | FOREST SERVICE | | 59,100,000 |
| **IPA 2016 total** | | | 60,180,000 | 95,062,000 |
| **IPA 2017** | IPA 2017 - Environmental Protection Sector | MINISTRY OF PROTECTION ENVIRONMENT | 91,731,000 | 158,269,000 |
| | | MINISTRY OF AGRICULTURE, FORESTRY AND WATER MANAGEMENT | | 12,000,000 |
| | | REPUBLIC WATER DIRECTORATE | 117,940,000 | 247,277,000 |
| | IPA 2017 - Support for European integration | MINISTRY OF INTERIOR | | 282,793,000 |
| | IPA 2017 - unallocated funds | MINISTRY OF EUROPEAN INTEGRATION | | 8,640,000 |
| | | MINISTRY OF TRADE, TOURISM AND TELECOMMUNICATIONS | | 24,000,000 |
| | | AGRICULTURAL PAYMENTS ADMINISTRATION | | 16,295,000 |
| | | PLANT PROTECTION ADMINISTRATION | | 60,240,000 |
| **IPA 2017 total** | | | 209,671,000 | 809,514,000 |
| **IPA 2018** | IPA 2018 - National Program | REPUBLICAN BUREAU OF STATISTICS | 319,470,000 | 1,074,596,000 |
| | IPA 2018 - Competitiveness | MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGICAL DEVELOPMENT | 146,250,000 | 100,000,000 |
| | IPA 2018 - Environmental Protection Sector | MINISTRY OF ENVIRONMENTAL PROTECTION | 30,809,000 | 269,191,000 |

| IPA year | Project Name | User name | co-financing / pre-financing | European Union funds |
|---|---|---|---|---|
| | IPA 2018 - Support to improving the capacity of relevant institutions in the "SoHo" system | MINISTRY OF HEALTH | 45,485,000 | 160,650,000 |
| | IPA 2018 - Democracy and Governance | MINISTRY OF CONSTRUCTION, TRANSPORT AND INFRASTRUCTURE | 9,600,000 | 43,704,000 |
| | IPA 2018 - Strengthening consumer protection in the Republic of Serbia in response to new market challenges | MINISTRY OF TRADE, TOURISM AND TELECOMMUNICATIONS | 5,400,000 | 88,650,000 |
| **IPA 2018 total** | | | 557,014,000 | 1,736,791,000 |
| **IPA 2019** | Strengthening the professional capacities of state officers in office | NATIONAL ACADEMY OF PUBLIC ADMINISTRATION | | 32,405,000 |
| | IPA 2019 - Improving the business environment in Serbia through better coordination, promotion of competitiveness and transparency | MINISTRY OF ECONOMY | | 50,000,000 |
| | IPA 2019 - Recapitalization of support programs for micro and small enterprises for the procurement of equipment | MINISTRY OF ECONOMY | | 100,000,000 |
| **IPA 2019 total** | | | | 182,405,000 |
| **IPA 2020** | IPA 2020 - Support to the implementation of active employment policy measures | MINISTRY OF LABOR, EMPLOYMENT, VETERANS AND SOCIAL ISSUES | 87,750,000 | 100,000,000 |
| | IPA 2020 - Modernization of the social protection system | MINISTRY OF LABOR, EMPLOYMENT, VETERANS AND SOCIAL ISSUES | | 100,000,000 |
| | IPA 2019-2020 EU Integration Facility Support to the EU integration process - direct management | MINISTRY OF HEALTH | 24,000,000 | 96,000,000 |
| | IPA 2020 - Democracy and governance | MINISTRY OF CONSTRUCTION, TRANSPORT AND INFRASTRUCTURE | 48,000,000 | 81,600,000 |
| | IPA 2020 - Education, employment and social policies | MINISTRY OF LABOR, EMPLOYMENT, VETERANS AND SOCIAL ISSUES | | 100,000,000 |

| IPA year | Project Name | User name | co-financing / pre-financing | European Union funds |
|---|---|---|---|---|
| | | MINISTRY OF HEALTH | | 144,000,000 |
| **IPA 2020 total** | | | 159,750,000 | 621,600,000 |
| **total** | | | 4,511,251,000 | 6,955,437,000 |

## 3.3 SID Municipality

### 3.3.1 Fiscal year 2016

Article 1

Realized current revenues and receipts, as well as current expenditures and expenses in the consolidated final account of the budget of the municipality of Sid in 2016 amount to (in thousands of dinars):

1. Total realized current revenues, income from sale of non - financial assets 899,706
2. Total current expenses and expenditures 922,016
3. Difference between total revenues, incomes and total expenditures, expenditures 22,310

Article 2

In the consolidated balance sheet (Form 1) as at 31 December 2016, total assets in the amount of RSD 995,756 thousand and total liabilities in the amount of RSD 995,756 thousand were determined.

Assets: in 000 dinars

| Code | Description | Amount | Structure |
|---|---|---|---|
| 010000 | Non-financial assets in fixed assets | 842.010 | 84,56% |
| 020000 | Non-financial assets in inventories | 3.916 | 0,39% |
| 110000 | Long-term financial assets | 100 | 0,01% |
| 120000 | Cash, precious metals, securities, receivables and short - term placements | 113.115 | 11,36% |
| 130000 | Active accruals | 36.615 | 3,68% |
| | Total assets | 995.756 | 100,00% |

Liabilities: in 000 dinars

| Code | Description | Amount | Structure |
|---|---|---|---|
| 200000 | Obligations | 88.384 | 8.88% |
| 300000 | Capital, determination of business results and off-balance sheet records | 907.372 | 91.12% |
| | Total liabilities | 995.756 | 100% |

Article 3

In the consolidated balance sheet (Form 1) as at 31 December 2016, an undistributed surplus of income and receipts from previous years was determined in the amount of RSD 23,512 thousand and a surplus of RSD 1,202 thousand.

Article 4

The consolidated balance of income and expenditure (Form 2) for the period from January 1, 2016 to December 31, 2016 determines the following amounts, as follows:

in 000 dinars

| | |
|---|---|
| 1. Total current income and receipts from the sale of non-financial assets | 899.706 |
| 2. Total incurred current expenditures and expenses for the acquisition of non-financial assets | 922.016 |
| 3. Financial result - budget deficit | 22.310 |

The determined financial result - the budget deficit for 2016 is covered from the part of transferred unspent funds from previous years.

Revenues and income: in 000 dinars

| Code | Description | Amount | Structure |
|---|---|---|---|
| 711100 | Income tax and capital gains paid by individuals | 325.045 | 36.13% |
| 712100 | Earnings tax | 1 | 0,00% |
| 713100 | Periodic real estate tax | 116.618 | 12.96% |
| 713300 | Legacy, inheritance and gift taxes | 3.428 | 0.38% |
| 713400 | Tax on financial and capital transactions | 24.627 | 2.73% |
| 714400 | Tax on individual services | 147 | 0.02% |
| 714500 | Taxes, fees and charges on the use of goods | 28.084 | 3.12% |
| 716100 | Other taxes paid exclusively by companies, i.e. entrepreneurs | 6.652 | 0.74% |
| 733100 | Current transfers from other levels of government | 265.694 | 29.53% |
| 733200 | Capital transfers from other levels of government | 44.404 | 4.94% |
| 741500 | Lease of non-productive assets | 33.737 | 3.75% |
| 742100 | Revenues from sales of goods and services or leases by market organizations | 10.392 | 0.12% |
| 742200 | Fees and charges | 4.516 | 0.50% |
| 742300 | Ancillary sales of goods and services performed by government non-market units | 1.810 | 0.20% |
| 743300 | Revenues from fines for misdemeanors | 5.261 | 0.58% |
| 743900 | Other fines, penalties and proceeds from confiscated property benefits | 33 | 0.00% |
| 744100 | Ongoing voluntary transfers from individuals and legal entities | 3.795 | 0.42% |
| 745100 | Mixed and indefinite income | 15.568 | 1.73% |
| 771100 | Memorandum items for reimbursement of expenses | 7.249 | 0.81% |
| 772100 | Memorandum items for reimbursement of expenses from the previous year | 1.067 | 0.12% |
| 811100 | Proceeds from the sale of real estate | 230 | 0.03% |
| 823100 | Proceeds from sale of goods for resale | 1.348 | 0.15% |
| Total revenues and income: | | 899,706 | 100.00% |

Expenditures and expenses: in 000 dinars

Current expenses and expenditures:

| Code | Description | Amount | Structure |
|---|---|---|---|
| 411100 | Salaries, allowances and employee benefits | 173,513 | 18.82 |
| 412100 | Pension and disability insurance contributions | 20,742 | 2.25 |
| 412200 | Health insurance contributions | 8,902 | 0.97 |
| 412300 | Unemployment contributions | 1,296 | 0.14 |
| 413100 | Fees in kind | 150 | 0.02 |
| 414100 | Payment of compensation during absence from work at the expense of funds | 8,316 | 0.90 |
| 414300 | Severance pay and benefits | 2,106 | 0.23 |
| 414400 | Assistance in medical treatment of an employee or close family members and other assistance to an employee | 127 | 0.01 |
| 415100 | Employee benefits | 10,140 | 1.10 |
| 416100 | Employee awards and other special expenses | 1,897 | 0.21 |

| | | | |
|---|---|---|---|
| 421100 | Costs of payment operations and banking services | 2,435 | 0.26 |
| 421200 | Energy services | 37,325 | 4.05 |
| 421300 | Communal services | 43,461 | 4.71 |
| 421400 | Communication services | 10,193 | 1.11 |
| 421500 | Insurance costs | 1,690 | 0.18 |
| 421600 | Lease of property and equipment | 1,023 | 0.11 |
| 421900 | Other expenses | 1,673 | 0.18 |
| 422100 | Expenses for business trips in the country | 962 | 0.10 |
| 422200 | Expenses for business trips abroad | 247 | 0.03 |
| 422300 | Travel expenses as part of regular work | 300 | 0.03 |
| 422400 | Student travel expenses | 490 | 0.05 |
| 422900 | Other transport costs | 81 | 0.01 |
| 423100 | Administrative services | 11,142 | 1.21 |
| 423200 | Computer services | 2,464 | 0.27 |
| 423300 | Employee education and training services | 2,404 | 0.26 |
| 423400 | Information services | 18,132 | 1.97 |
| 423500 | Professional services | 31,048 | 3.37 |
| 423600 | Household and catering services | 1,136 | 0.12 |
| 423700 | Representation | 5,259 | 0.57 |
| 423900 | Other general services | 9,507 | 1.03 |
| 424200 | Education, culture and sports services | 3,279 | 0.36 |
| 424300 | Medical services | 908 | 0.10 |
| 424400 | Highway maintenance services (local roads) | 70,278 | 7.62 |
| 424500 | Maintenance services of national parks and natural areas | 6,983 | 0.76 |
| 424600 | Environmental protection services, science and geodetic services | 12,056 | 1.31 |
| 424900 | Other specialized services | 14,695 | 1.59 |
| 425100 | Ongoing repairs and maintenance of buildings and structures | 59,627 | 6.47 |
| 425200 | Ongoing repairs and maintenance of equipment | 3,435 | 0.37 |
| 426100 | Administrative material | 4,774 | 0.52 |
| 426200 | Material for agriculture | 429 | 0.05 |
| 426300 | Material for education and training of employees | 1,329 | 0.14 |
| 426400 | Traffic material | 5,797 | 0.63 |
| 426600 | Material for education, culture and sports | 2,712 | 0.29 |
| 426700 | Medical laboratory material | 103 | 0.01 |
| 426800 | Hygiene maintenance and catering material | 13,219 | 1.43 |
| 426900 | Material for other purposes | 10,513 | 1.14 |
| 441400 | Repayment of interest to domestic commercial banks | 897 | 0.10 |
| 451100 | Current subsidies to public non-financial companies and organizations | 12,425 | 1.35 |
| 454100 | Current subsidies to private companies | 1,305 | 0.14 |
| 463100 | Current transfers to other levels of government | 74,178 | 8.05 |
| 464100 | Ongoing grants to compulsory social security organizations | 508 | 0.06 |
| 465100 | Other current grants and transfers | 31,280 | 3.39 |
| 465200 | Other capital grants and transfers | 18,824 | 2.04 |
| 472300 | Budget benefits for children and family | 9,582 | 1.04 |

| | | | |
|---|---|---|---|
| 472700 | Fees from the budget for education, culture, science and sports | 21,673 | 2.35 |
| 472900 | Other fees from the budget | 29,956 | 3.25 |
| 481100 | Grants to non-profit organizations | 11,537 | 1.25 |
| 481900 | Grants to other non-profit institutions | 36,339 | 3.94 |
| 482100 | Other taxes | 794 | 0.09 |
| 482200 | Mandatory fees | 309 | 0.03 |
| 482300 | Fines and penalties | 76 | 0.01 |
| 483100 | Fines and penalties by court decision | 2,661 | 0.29 |
| 484100 | Compensation for injuries or damage caused by natural disasters | 448 | 0.05 |
| 485100 | Compensation for injuries or damage caused by state authorities | 3,089 | 0.34 |
| 511200 | Construction of buildings and structures | 13,389 | 1.45 |
| 511300 | Capital maintenance of buildings and structures | 758 | 0.08 |
| 511400 | Project planning | 5,991 | 0.65 |
| 512100 | Traffic equipment | 4,926 | 0.53 |
| 512200 | Administrative equipment | 6,790 | 0.74 |
| 512500 | Medical and laboratory equipment | 46 | 0.00 |
| 512600 | Equipment for education, science, culture and sports | 5,373 | 0.58 |
| 512800 | Public safety equipment | 7,718 | 0.84 |
| 512900 | Production equipment, motor, stationary and non-motor equipment | 649 | 0.07 |
| 515100 | Intangible assets | 405 | 0.04 |
| 523100 | Stocks of goods for resale | 1,792 | 0.19 |
| | Total current expenditures and expenses: | 922,016 | 100% |

Article 5

The difference between the total amount of current revenues, income generated from the sale of non-financial assets and the total amount of current expenditures and expenses for the acquisition of non-financial assets, was determined in the total amount of 22,310 thousand dinars, which is a budget deficit. provided that the deficit of income and receipts for the amount of expenses and from the part of transferred unspent funds from previous years which was used to cover expenditures and expenses of the current year (in the amount of 23,512 thousand dinars).

in 000 dinars

| Code | Description | Amount |
|---|---|---|
| Income: | | |
| 800000 | Proceeds from sale of non - financial assets | 1.578<br>1.578 |
| Total income: | | 1.578<br>1.578 |
| Expenditures: | | |
| 511000 | Buildings and structures | 20.138 |
| 512000 | Machinery and equipment | 25.502 |
| 515000 | Intangible assets | 405 |
| 523000 | Stocks of goods for resale | 1.792 |
| 611000 | Repayment of principal to domestic creditors | 5.349 |
| *Total expenses:* | | 53.186 |
| Lack of income: | | 51.608 |

Article 7

In the consolidated statement of cash flows (Form 4) in the period from January 1 to December 31, 2016, total cash inflows into the budget in the amount of 899,706 thousand dinars, cash outflows in the amount of 927,365 thousand and cash balance at the end of the year in the amount of 81,618 thousand dinars were determinated.

in 000 dinars

| Code | Description | Amount | Structure |
|---|---|---|---|
| Cash balance at the beginning of the year | | 90.064 | - |
| Cash inflows: | | | |
| 710000 | Taxes | 504.602 | 56,09% |
| 730000 | Donations, aid and transfers | 310.098 | 34,67% |
| 740000 | Other income | 75.112 | 8,35% |
| 770000 | Memorandum items for refund | 8.316 | 0,92% |
| 810000 | Proceeds from the sale of fixed assets | 230 | 0,03/% |
| 820000 | Proceeds from sale of inventories | 1.348 | 0,15% |
| Total cash inflows | | 899.706 | 100.00% |
| Cash outflows: | | | |
| 410000 | Employee expenses | 227.189 | 24,50% |
| 420000 | Use of services and goods | 391.109 | 42,17% |
| 440000 | Repayment of interest and associated costs | | 0,10% |
| 450000 | Subsidies | 13.730 | 1,48% |
| 460000 | Donations, grants and transfers | 124.790 | 13,46% |
| 470000 | Social security and social protection | 61.211 | 6,60% |
| 480000 | Other expenses | 55.253 | 5,96% |
| 510000 | Fixed assets | 46.045 | 4,97% |
| 520000 | Supplies | 1.792 | 0,19% |
| 610000 | Principal repayment expenses | 5.349 | 0,58% |
| Total cash outflows | | 927.365 | 100.00% |
| | *Lack of cash inflows* | 27.659 | |
| | *Cash balance at the end of the year* | 81.618 | |

### 3.3.2 Fiscal year 2017

Article 1

Realized current revenues and incomes, as well as current expenditures and expenses in the consolidated final account of the budget of the municipality of Sid in 2017 amount to (in thousands of dinars):

1. Total realized current revenues, income from sale of non-financial assets 1,044,225
2. Total current expenditures and expenses 1,044,446
3. Difference between total revenues, incomes and total expenditures, expenditures 221

Article 2

In the consolidated balance sheet (Form 1) as at 31 December 2017, total assets and total liabilities in the amount of RSD 1,070,282 thousand were determined.

Assets: in 000 dinars

| Code | Description | Amount | Structure |
|---|---|---|---|
| 10000 | Non-financial assets in fixed assets | 935,160 | 87.38% |
| 20000 | Non-financial assets in inventories | 4,688 | 0.44% |
| 110000 | Long-term financial assets | 100 | 0.01% |
| 120000 | Cash, precious metals, securities, receivables and short-term placements | 64,193 | 6.00% |
| 130000 | Active accruals | 66,141 | 6.18% |
| | Total assets | 1,070,282 | 100.00% |

Liabilities: in 000 dinars

| Code | Description | Amount | Structure |
|---|---|---|---|
| 200000 | Obligations | 119,799 | 11.19% |
| 300000 | Capital, determination of business results and off-balance sheet records | 950,483 | 88.81% |
| | Total liabilities | 1,070,282 | 100.00% |

Article 3

In the consolidated balance sheet (Form 1) as at 31 December 2017, an undistributed surplus of income and receipts from previous years is determinated in the amount of RSD 33,220 thousand and a surplus of RSD 3,036 thousand by one indirect user of public services, a deficit from previous years in the amount of 57 thousand dinars was also reported.

| | in 000 dinars |
|---|---|
| 1. Total current income and receipts from the sale of non-financial assets | 1.044.225 |
| 2. Total incurred current expenditures and expenses for the acquisition of non-financial assets | 1.044.446 |
| 3. Financial result - budget deficit | 221 |

The determined financial result - the budget deficit for 2017 will be covered from the part of undistributed surplus revenue and income from previous years.

Revenues and income: in 000 dinars

| Code | Description | Amount | Structure |
|---|---|---|---|
| 711100 | Income tax and capital gains paid by individuals | 322,161 | 30.85% |
| 712100 | Earnings tax | | 0,00% |
| 713100 | Periodic real estate tax | 116,773 | 11.18% |
| 713300 | Legacy, inheritance and gift taxes | 3,756 | 0.36% |
| 713400 | Tax on financial and capital transactions | 45,511 | 4.36% |

| | | | |
|---|---|---|---|
| 714400 | Tax on individual services | 204 | 0.02% |
| 714500 | Taxes, fees and charges on the use of goods | 30,751 | 2.94% |
| 716100 | Other taxes paid exclusively by companies, i.e. entrepreneurs | 7,197 | 0.69% |
| 732000 | Donations and assistance from international organizations | 44,004 | 4.21% |
| 733100 | Current transfers from other levels of government | 305,796 | 29.28% |
| 733200 | Capital transfers from other levels of government | 81,936 | 7.85% |
| 741400 | Income from property belonging to the holders of insurance policies | 65 | 0.01% |
| 741500 | Lease of non-productive assets | 31,608 | 3.03% |
| 742100 | Revenues from sales of goods and services or leases by market organizations | 19,840 | 1.90% |
| 742200 | Fees and charges | 5,966 | 0.57% |
| 742300 | Ancillary sales of goods and services performed by government non-market units | 1,718 | 0.16% |
| 743300 | Revenues from fines for misdemeanors | 5,413 | 0.52% |
| 743900 | Other fines, penalties and proceeds from confiscated property | 68 | 0.01% |
| 744100 | Ongoing voluntary transfers from individuals and legal entities | 3,693 | 0.35% |
| 745100 | Mixed and indefinite income | 4,131 | 0.40% |
| 771100 | Memorandum items for reimbursement of expenses | 6,706 | 0.64% |
| 772100 | Memorandum items for reimbursement of expenses from the previous year | 1,291 | 0.12% |
| 811100 | Proceeds from the sale of real estate | 3,433 | 0.33% |
| 823100 | Proceeds from sale of goods for resale | 2,204 | 0.21% |
| Total revenues and income: | | 1,044,225 | 100.00% |

Expenditures and expenses: in 000 dinars

Current expenses and expenditures:

| Code | Description | Amount | Structure in % |
|---|---|---|---|
| 411100 | Salaries, allowances and employee benefits | 181,166 | 17.35% |
| 412100 | Pension and disability insurance contributions | 21,493 | 2.06% |
| 412200 | Health insurance contributions | 8,902 | 0.85% |
| 412300 | Unemployment contributions | 9,225 | 0.88% |
| 413100 | Fees in kind | 1,344 | 0.13% |
| 414100 | Payment of compensation during absence from work at the expense of funds | 7,241 | 0.69% |
| 414300 | Severance pay and benefits | 2,507 | 0.24% |
| 414400 | Assistance in medical treatment of the employee or close family members, and other assistance to the employee | 138 | 0.01% |
| 415100 | Employee benefits | 10,304 | 0.99% |
| 416100 | Employee awards and other special expenses | 3,648 | 0.35% |

| | | | |
|---|---|---|---|
| 421100 | Costs of payment operations and banking services | 2,294 | 0.22% |
| 421200 | Energy services | 34,522 | 3.31% |
| 421300 | Communal services | 17,279 | 1.65% |
| 421400 | Communication services | 8,894 | 0.85% |
| 421500 | Insurance costs | 1,744 | 0.17% |
| 421600 | Lease of property and equipment | 1,040 | 0.10% |
| 421900 | Other expenses | 1,357 | 0.13% |
| 422100 | Expenses for business trips in the country | 1,709 | 0.16% |
| 422200 | Expenses for business trips abroad | 286 | 0.03% |
| 422300 | Travel expenses as part of regular work | 411 | 0.04% |
| 422400 | Student travel expenses | 109 | 0.01% |
| 422900 | Other transport costs | 204 | 0.02% |
| 423100 | Administrative services | 11,200 | 1.07% |
| 423200 | Computer services | 2,675 | 0.26% |
| 423300 | Employee education and training services | 2,327 | 0.22% |
| 423400 | Information services | 20,541 | 1.97% |
| 423500 | Professional services | 34,035 | 3.26% |
| 423600 | Household and catering services | 3,269 | 0.31% |
| 423700 | Representation | 6,476 | 0.62% |
| 423900 | Other general services | 8,848 | 0.85% |
| 424100 | Agricultural services | 399 | 0.04% |
| 424200 | Education, culture and sports services | 1,014 | 0.10% |
| 424300 | Medical services | 1,006 | 0.10% |
| 424400 | Highway maintenance services (local roads) | 43,827 | 4.20% |
| 424500 | Maintenance services of national parks and natural areas | 18,542 | 1.78% |
| 424600 | Environmental protection services, science and surveying services | 11,688 | 1.12% |
| 424900 | Other specialized services | 36,212 | 3.47% |
| 425100 | Ongoing repairs and maintenance of buildings and structures | 41,759 | 4.00% |
| 425200 | Ongoing repairs and maintenance of equipment | 3,799 | 0.36% |
| 426100 | Administrative material | 4,176 | 0.40% |
| 426200 | Material for agriculture | 150 | 0.01% |
| 426300 | Material for education and training of employees | 1,535 | 0.15% |
| 426400 | Traffic material | 5,508 | 0.53% |
| 426600 | Material for education, culture and sports | 4,643 | 0.44% |
| 426700 | Medical laboratory material | 124 | 0.01% |
| 426800 | Hygiene maintenance and catering material | 13,254 | 1.27% |
| 426900 | Material for other purposes | 13,566 | 1.30% |
| 441400 | Repayment of interest to domestic commercial banks | 672 | 0.06% |
| 451100 | Current subsidies to public non-financial companies and organizations | 9,500 | 0.91% |
| 451200 | Capital subsidies to public non-financial companies and organizations | 4,770 | 0.46% |
| 454100 | Current subsidies to private companies | 3,915 | 0.37% |

| | | | |
|---|---|---|---|
| 463100 | Current transfers to other levels of government | 91,623 | 8.77% |
| 463200 | Capital transfers to other levels of government | 400 | 0.04% |
| 464100 | Ongoing grants to compulsory social security organizations | 4,800 | 0.46% |
| 465100 | Other current grants and transfers | 18,843 | 1.80% |
| 465200 | Other capital grants and transfers | 29,872 | 2.86% |
| 472300 | Budget benefits for children and family | 12,563 | 1.20% |
| 472700 | Fees from the budget for education, culture, science and sports | 38,835 | 3.72% |
| 472900 | Other fees from the budget | 21,660 | 2.07% |
| 481100 | Grants to non-profit organizations | 11,425 | 1.09% |
| 481900 | Grants to other non-profit institutions | 33,830 | 3.24% |
| 482100 | Other taxes | 165 | 0.02% |
| 482200 | Mandatory fees | 1,061 | 0.10% |
| 482300 | Fines and penalties | 128 | 0.01% |
| 483100 | Fines and penalties by court decision | 35,377 | 3.39% |
| 485100 | Compensation for injuries or damage caused by state authorities | 1,682 | 0.16% |
| 511200 | Construction of buildings and structures | 33,426 | 3.20% |
| 511300 | Capital maintenance of buildings and structures | 21,588 | 2.07% |
| 511400 | Project planning | 9,818 | 0.94% |
| 512100 | Traffic equipment | 15,965 | 1.53% |
| 512200 | Administrative equipment | 8,104 | 0.78% |
| 512600 | Equipment for education, science, culture and sports | 295 | 0.03% |
| 512800 | Public safety equipment | 11,715 | 1.12% |
| 512900 | Production equipment, motor, stationary and non-motor equipment | 21,913 | 2.10% |
| 513100 | Other real estate and equipment | 40 | 0.00% |
| 515100 | Intangible assets | 464 | 0.04% |
| 523100 | Stocks of goods for resale | 2,331 | 0.22% |
| 541100 | Land | 178 | 0.02% |
| Total current expenditures and expenses: | | 1,044,446 | 100.00% |

Article 5

The difference between the total amount of current revenues, receipts generated from the sale of non-financial assets and the total amount of current expenditures and expenses for the acquisition of non-financial assets was determined in the total amount of 221 thousand dinars, which is a budget deficit. with the correction of the deficit of income and receipts for the amount of expenditures and from the part of transferred unspent funds from previous years, which was used to cover expenditures and expenses of the current year.

Article 6

In the consolidated report on capital expenditures and financing (Form 3) in the period from January 1 to December 31, 2017, the total income in the amount of 5,637 thousand dinars was determined. Total expenses for non-financial assets are 131,109 thousand dinars.

| Code | Description | Amount |
|---|---|---|
| Income: | | |

| | | |
|---|---|---|
| 800000 | Proceeds from the sale of non-financial assets | 5,637 |
| *Total income:* | | 5,637 |
| Expenditures: | | |
| 511000 | Buildings and structures | 64,832 |
| 512000 | Machinery and equipment | 57,992 |
| 513000 | Other real estate and equipment | 40 |
| 515000 | Intangible assets | 464 |
| 523000 | Stocks of goods for resale | 2,331 |
| 541000 | Land | 178 |
| 611000 | Repayment of principal to domestic creditors | 5,272 |
| *Total expenses:* | | 131,109 |
| Lack of income: | | 125,472 |

Article 7

In the consolidated statement of cash flows (Form 4) in the period from January 1 to December 31, 2017, determines the total cash inflows into the budget in the amount of 1,044,225 thousand dinars, cash outflows in the amount of 1,049,718 thousand and the balance cash at the end of the year in the amount of RSD 25,704 thousand.

| Code | Description | Amount | Structure |
|---|---|---|---|
| Cash balance at the beginning of the year | | 81,618.00 | |
| Cash inflows: | | | |
| 710000 | Taxes | 526,353.00 | 50.41% |
| 730000 | Donations, aids and transfers | 431,736.00 | 41.35% |
| 740000 | Other income | 72,502.00 | 6.94% |
| 770000 | Memorandum items for refund | 7,997.00 | 0.77% |
| 810000 | Proceeds from the sale of fixed assets | 3,433.00 | 0.33% |
| 820000 | Proceeds from sale of inventories | 2,204.00 | 0.21% |
| Total cash inflows | | 1,044,225.00 | 100.00% |
| Cash outflows: | | | |
| 410000 | Employee expenses | 237,066.00 | 22.58% |
| 420000 | Use of services and goods | 360,422.00 | 34.34% |
| 440000 | Repayment of interest and accompanying borrowing costs | 672.00 | 0.06% |
| 450000 | Subsidies | 18,185.00 | 1.73% |
| 460000 | Donations, grants and transfers | 145,538.00 | 13.86% |
| 470000 | Social security and social protection | 73,058.00 | 6.96% |
| 480000 | Other expenses | 83,668.00 | 7.97% |
| 510000 | Fixed assets | 123,328.00 | 11.75% |
| 540000 | Natural assets | 178.00 | 0.02% |
| 520000 | Supplies | 2,331.00 | 0.22% |
| 610000 | Principal repayment expenses | 5,272.00 | 0.50% |
| Total cash outflows | | 1,049,718.00 | 100.00% |
| Lack of cash inflows | | 5,493.00 | |
| Cash balance at the end of the year | | 25,704.00 | |

### 3.3.3 Fiscal year 2018

Article 1.

Realized current revenues and receipts, as well as current expenditures and expenses in the consolidated final account of the budget of the municipality of Sid in 2018 amount to (in thousands of dinars):

1. Total realized current revenues, income from sale of non-financial assets: 1,064,835

2. Total current expenditures and expenses: 1,101,080
3. Difference between total revenues, incomes and total expenditures, expenses: 36,245
Article 2
"In the consolidated balance sheet (Form 1) as at 31 December 2018, total assets and total liabilities in the amount of RSD 1,162,011 thousand were determined."

In the consolidated balance sheet (Form 1) as at 31 December 2018, total assets and total liabilities in the amount of RSD 1,162,011 thousand were determined.

Assets: in 000 dinars

| Code | Description | Amount | Structure |
|---|---|---|---|
| 01000 | Non-financial assets in fixed assets | 1,045,521 | 89.98% |
| 02000 | Non-financial assets in inventories | 4,782 | 0.41% |
| 110000 | Long-term financial assets | 100 | 0.01% |
| 120000 | Cash, precious metals, securities, receivables and short-term placements | 49,343 | 4.25% |
| 130000 | Active accruals | 62,265 | 5.36% |
| Total assets | | 1,162,011 | 100.01% |

Liabilities: in 000 dinars

| Code | Description | Amount | Structure |
|---|---|---|---|
| 200000 | Obligations | 139,180 | 11.19% |
| 300000 | Capital, determination of business results and off-balance sheet records | 1,022,831 | 88.81% |
| Total liabilities | | 1,162,011 | 100% |

Article 3

In the consolidated balance sheet (Form 1) as at 31 December 2018, an undistributed surplus of income and receipts from previous years in the amount of 4 thousand dinars and a surplus of 9,145 thousand dinars, as well as balance sheet assets and liabilities in the amount of 6,431 thousand dinars. One indirect user of public funds also stated other own source in the amount of 1,260 thousand dinars.

Article 4
The consolidated balance of revenues and expenditures (Form 2) for the period from January 1, 2018 to December 31, 2018, determines the following amounts, as follows:

in 000 dinars

| | |
|---|---|
| 1. Total current income and receipts from the sale of non-financial assets | 1.064.835 |
| 2. Total incurred current expenses and expenditures for procurement of non-financial assets | 1.101.080 |
| 3. Financial result - budget deficit | 36 |

Determined financial result - the budget deficit for 2018 is covered from the part of undistributed surplus revenue and income from previous years and from loans (amount of expenditures and expeses for non-financial assets financed from loans), with current revenues and income from sells non-financial assets to repay loan obligations.

Revenues and income: in 000 dinars

| Code | Description | Amount | Structure % |
|---|---|---|---|
| 711100 | Income tax and capital gains paid by individuals | 344,069 | 32.31% |
| 713100 | Periodic real estate tax | 140,767 | 13.22% |

| | | | |
|---|---|---|---|
| 713300 | Legacy, inheritance and gift taxes | 7,618 | 0.72% |
| 713400 | Tax on financial and capital transactions | 42,808 | 4.02% |
| 714400 | Tax on individual services | 157 | 0.01% |
| 714500 | Taxes, fees and charges on the use of goods | 36,320 | 3.41% |
| 716100 | Other taxes paid exclusively by companies, i.e. entrepreneurs | 7,321 | 0.69% |
| 732000 | Donations and assistance from international organizations | 2,801 | 0.26% |
| 733100 | Current transfers from other levels of government | 318,354 | 29.90% |
| 733200 | Capital transfers from other levels of government | 67,702 | 6.36% |
| 741500 | Lease of non-productive assets | 28,814 | 2.71% |
| 742100 | Revenues from sales of goods and services or leases by market organizations | 22,461 | 2.11% |
| 742200 | Fees and charges | 5,434 | 0.51% |
| 742300 | Ancillary sales of goods and services performed by government non-market units | 1,876 | 0.18% |
| 743300 | Revenues from fines for misdemeanors | 8,310 | 0.78% |
| 744100 | Ongoing voluntary transfers from individuals and legal entities | 7,030 | 0.66% |
| 745100 | Mixed and indefinite income | 4,091 | 0.38% |
| | Memorandum items for reimbursement of expenses from the previous year | 9,147 | 0.86% |
| 811100 | Proceeds from the sale of real estate | 8,352 | 0.78% |
| 812100 | Proceeds from the sale of movable property | 102 | 0.01% |
| 823100 | Proceeds from sale of goods for resale | 1,301 | 0.12% |
| Total revenues and income: | | 1,064,835 | |

| Current expenses and expenditures: | | Amount | Structure % |
|---|---|---|---|
| Code | Description | | |
| 411100 | Salaries, allowances and employee benefits | 189,876 | 17.24% |
| 412100 | Pension and disability insurance contributions | 22,524 | 2.05% |
| 412200 | Health insurance contributions | 9,666 | 0.88% |
| 412300 | Unemployment contributions | 1,407 | 0.13% |
| 414100 | Payment of compensation during absence from work at the expense of funds | 641 | 0.06% |
| 414300 | Severance pay and benefits | 1,471 | 0.13% |
| 414400 | Assistance in medical treatment of the employee or immediate family members and other assistance to the employee | 723 | 0.07% |
| 415100 | Employee benefits | 9,769 | 0.89% |
| 416100 | Employee awards and other special expenses | 3,724 | 0.34% |

| | | | |
|---|---|---|---|
| 421100 | Costs of payment operations and banking services | 2,334 | 0.21% |
| 421200 | Energy services | 45,142 | 4.10% |
| 421300 | Communal services | 21,399 | 1.94% |
| 421400 | Communication services | 9,083 | 0.82% |
| 421500 | Insurance costs | 2,402 | 0.22% |
| 421600 | Lease of property and equipment | 2,812 | 0.26% |
| 421900 | Other expenses | 959 | 0.09% |
| 422100 | Expenses for business trips in the country | 1,491 | 0.14% |
| 422200 | Expenses for business trips abroad | 58 | 0.01% |
| 422300 | Travel expenses as part of regular work | 498 | 0.05% |
| 422400 | Student travel expenses | 31 | 0.00% |
| 422900 | Other transport costs | 135 | 0.01% |
| 423100 | Administrative services | 9,354 | 0.85% |
| 423200 | Computer services | 3,658 | 0.33% |
| 423300 | Employee education and training services | 2,496 | 0.23% |
| 423400 | Information services | 18,059 | 1.64% |
| 423500 | Professional services | 35,284 | 3.20% |
| 423600 | Household and catering services | 1,848 | 0.17% |
| 423700 | Representation | 6,484 | 0.59% |
| 423900 | Other general services | 5,977 | 0.54% |
| 424100 | Agricultural services | 491 | 0.04% |
| 424200 | Education, culture and sports services | 2,809 | 0.26% |
| 424300 | Medical services | 958 | 0.09% |
| 424400 | Highway maintenance services (local roads) | 57,125 | 5.19% |
| 424500 | Maintenance services of national parks and natural areas | 20,344 | 1.85% |
| 424600 | Environmental protection services, science and surveying services | 14,152 | 1.29% |
| 424900 | Other specialized services | 59,281 | 5.38% |
| 425100 | Ongoing repairs and maintenance of buildings and structures | 26,458 | 2.40% |
| 425200 | Ongoing repairs and maintenance of equipment | 3,675 | 0.33% |
| 426100 | Administrative material | 4,617 | 0.42% |
| 426200 | Material for agriculture | 205 | 0.02% |
| 426300 | Material for education and training of employees | 1,384 | 0.13% |
| 426400 | Traffic material | 8,728 | 0.79% |
| 426600 | Material for education, culture and sports | 5,439 | 0.49% |
| 426700 | Medical laboratory material | 125 | 0.01% |
| 426800 | Hygiene maintenance material and catering | 12,923 | 1.17% |
| 426900 | Material for other purposes | 9,874 | 0.90% |
| 441400 | Repayment of interest to domestic commercial banks | 482 | 0.04% |
| 444100 | Negative course differences | 4 | 0.00% |
| 444300 | Other ancillary borrowing costs | 53 | 0.00% |

| | | | |
|---|---|---|---|
| 451100 | Current subsidies to public non-financial companies and organizations | 13,998 | 1.27% |
| 454100 | Current subsidies to private companies | 4,380 | 0.40% |
| 462100 | Current grants to international organizations | 340 | 0.03% |
| 463100 | Current transfers to other levels of government | 109,445 | 9.94% |
| 464100 | Ongoing grants to compulsory social security organizations | 5,852 | 0.53% |
| 465100 | Other current grants and transfers | 16,890 | 1.53% |
| 465200 | Other capital grants and transfers | 5,732 | 0.52% |
| 472300 | Budget benefits for children and family | 14,956 | 1.36% |
| 472700 | Fees from the budget for education, culture, science and sports | 38,580 | 3.50% |
| 472800 | Housing and living allowances from the budget | 7,988 | 0.73% |
| 472900 | Other fees from the budget | 40,487 | 3.68% |
| 481100 | Grants to non-profit organizations | 9,615 | 0.87% |
| 481900 | Grants to other non-profit institutions | 34,991 | 3.18% |
| 482100 | Other taxes | 189 | 0.02% |
| 482200 | Mandatory fees | 211 | 0.02% |
| 482300 | Fines and penalties | 87 | 0.01% |
| 483100 | Fines and penalties by court decision | 1,823 | 0.17% |
| 485100 | Compensation for injuries or damage caused by state authorities | 3,033 | 0.28% |
| 511200 | Construction of buildings and structures | 107,951 | 9.80% |
| 511300 | Capital maintenance of buildings and structures | 15,905 | 1.44% |
| 511400 | Project planning | 12,804 | 1.16% |
| 512100 | Traffic equipment | 1,100 | 0.10% |
| 512200 | Administrative equipment | 11,458 | 1.04% |
| 512600 | Equipment for education, science, culture and sports | 357 | 0.03% |
| 512800 | Public safety equipment | 8 | 0.00% |
| 512900 | Production equipment, motor, stationary and non-motor equipment | 626 | 0.06% |
| 515100 | Intangible assets | 435 | 0.04% |
| 523100 | Stocks of goods for resale | 1,691 | 0.15% |
| 541100 | Land | 1,716 | 0.16% |
| Total current expenditures and expenses: | | 1,101,080 | |

Article 5

In the consolidated report on capital expenditures and financing (Form 3) in the period from January 1 to December 31, 2018, the total income in the amount of 36,471 thousand dinars was determined. Total expenses for non-financial assets are 159,187 thousand dinars.

in 000 dinars

| Code | Description | Amount |
|---|---|---|
| Income: | _ | _ |
| 800000 | Proceeds from the sale of non-financial assets | 9,755 |

| | | |
|---|---|---|
| 900000 | Income from borrowing and sale of financial assets | 26,716 |
| *Total income:* | | 36,471 |
| Expenditures: | | |
| 511000 | Buildings and structures | 136,660 |
| 512000 | Machinery and equipment | 13,549 |
| 513000 | Other real estate and equipment | 0 |
| 515000 | Intangible assets | 435 |
| 523000 | Stocks of goods for resale | 1,691 |
| 541000 | Land | 1716 |
| 611000 | Repayment of principal to domestic creditors | 5,136 |
| *Total expenses:* | | 159,187 |
| Lack of income: | | -122,716 |

Article 6

In the consolidated statement of cash flows (Form 4) in the period from January 1 to December 31, 2018, determined the total cash inflows into the budget in the amount of 1,091,551 thousand dinars, cash outflows in the amount of 1,106,216 thousand and cash balance at the end of the year in the amount of 25,704 thousand dinars.

| Code | Description | Amount | Structure % |
|---|---|---|---|
| Cash balance at the beginning of the year | | 25,704.00 | |
| Cash inflows: | | | |
| 710000 | Taxes | 579,060.00 | 53.05% |
| 730000 | Donations, aids and transfers | 388,857.00 | 35.62% |
| 740000 | Other income | 78,016.00 | 7.15% |
| 770000 | Memorandum items for refund | 9,147.00 | 0.84% |
| 810000 | Proceeds from the sale of fixed assets | 8,454.00 | 0.77% |
| 820000 | Proceeds from sale of inventories | 1,301.00 | 0.12% |
| 910000 | Income from borrowing | 26,716.00 | |
| Total cash inflows | | 1,091,551.00 | 100.00% |
| Cash outflows: | | | |
| 410000 | Employee expenses | 239,801.00 | 21.68% |
| 420000 | Use of services and goods | 398,092.00 | 35.99% |
| 440000 | Repayment of interest and accompanying borrowing costs | 539 | 0.05% |
| 450000 | Subsidies | 18,378.00 | 1.66% |
| 460000 | Donations, grants and transfers | 138,259.00 | 12.50% |
| 470000 | Social security and social protection | 102,011.00 | 9.22% |
| 480000 | Other expenses | 49,949.00 | 4.52% |
| 510000 | Fixed assets | 150,644.00 | 13.62% |
| 520000 | Supplies | 1,691.00 | |
| 540000 | Natural assets | 1716 | 0.16% |
| 610000 | Principal repayment expenses | 5,136.00 | 0.46% |
| Total cash outflows | | 1,106,216.00 | |
| Lack of cash inflows | | 14,665.00 | |
| Cash balance at the end of the year | | 9,171.00 | |

### 3.3.4 Fiscal year 2019

Article 1

Realized current revenues and incomes, as well as executed current expenditures and expenses in the consolidated final account of the budget of the municipality of Sid in 2019

in 000 dinars are:
I Total realized current income, income from sale of non-financial assets: 1,062,989
II Total current expenditures and expenses: 1,082,249
III Difference between total revenues, incomes and total expenditures, expenses: 19,260

Article 2

In the consolidated balance sheet (Form 1) as at 31 December 2019, total assets and total liabilities in the amount of RSD 1,162,011 thousand dinars were determined.

Assets: in 000 dinars

| Code | Description | Amount | structure in% |
|---|---|---|---|
| 1000 | Non-financial assets in fixed assets | 2,519,430 | 94.06% |
| 2000 | Non-financial assets in inventories | 4,389 | 0.16% |
| 110000 | Long-term financial assets | 100 | 0.01% |
| 120000 | Cash, precious metals, securities, receivables and short-term placements | 21,461 | 0.80% |
| 130000 | Active accruals | 132,891 | 4.96% |
| Total assets | | 2,678,271 | 100.00% |

Liabilities: in 000 dinars

| Code | Description | Amount | structure in% |
|---|---|---|---|
| 200000 | Obligations | 205,159 | 7.66% |
| 300000 | Capital, determination of business results and off-balance sheet records | 2,473,112 | 92.34% |
| Total liabilities | | 2,678,271 | 100% |

Article 3

In the consolidated balance sheet (Form 1) as at 31 December 2019, a surplus of RSD 13,502 thousand, an undistributed surplus of income and revenues from previous years of RSD 147 thousand, as well as off-balance sheet assets and liabilities in the amount of RSD 9,493 thousand were determined.

Article 4

The consolidated balance of income and expenditure (Form 2) for the period from January 1, 2019 to December 31, 2019 determines the following amounts, as follows:

| | |
|---|---|
| 1. Total realized current income and receipts from the sale of non-financial assets | 1,062,989.00 |
| 2. Total incurred current expenses and expenditures for procurement of non-financial assets | 1,082,249.00 |
| 3. Financial result - budget deficit | -19,260.00 |

Determined financial result - the budget deficit for 2019 is covered from the part of undistributed surplus income and revenues from previous years and from loans (amount of expenses and expenditure for non-financial assets financed from loans), with current income and revenues being spent during the year from the sale of non-financial assets for repayment of loan obligations.

Revenues and income: in 000 dinars

| Code | Description | Amount | structure in% |
|---|---|---|---|
| 711100 | Income tax and capital gains paid by individuals | 367,502.00 | 34.57% |
| 713100 | Periodic real estate tax | 133,575.00 | 12.57% |
| 713300 | Legacy, inheritance and gift taxes | 6,833.00 | 0.64% |
| 713400 | Tax on financial and capital transactions | 35,297.00 | 3.32% |
| 714400 | Tax on individual services | 39.00 | 0.00% |
| 714500 | Taxes, fees and charges on the use of goods | 23,065.00 | 2.17% |
| 716100 | Other taxes paid exclusively by companies, i.e. entrepreneurs | 8,510.00 | 0.80% |
| 732100 | Donations and assistance from international organizations | 10,861.00 | 1.02% |
| 732300 | Donations and assistance from the EU | 1,546.00 | 0.15% |
| 733100 | Current transfers from other levels of government | 274,945.00 | 25.87% |
| 733200 | Capital transfers from other levels of government | 89,621.00 | 8.43% |
| 741400 | Income from property belonging to holders of insurance policies | 98.00 | 0.01% |
| 741500 | Lease of non-productive assets | 32,738.00 | 3.08% |
| 742100 | Revenues from sales of goods and services or leases by market organizations | 23,399.00 | 2.20% |
| 742200 | Fees and charges | 6,785.00 | 0.64% |
| 742300 | Ancillary sales of goods and services performed by government non-market units | 2,173.00 | 0.20% |
| 743300 | Revenues from fines for misdemeanors | 11,564.00 | 1.09% |
| 743900 | Other fines, penalties and proceeds from confiscated property | 116.00 | 0.01% |
| 744100 | Ongoing voluntary transfers from individuals and legal entities | 3,986.00 | 0.37% |
| 745100 | Mixed and indefinite income | 24,406.00 | 2.30% |
| 771100 | Memorandum items for reimbursement of expenses | 73.00 | 0.01% |
| 772100 | Memorandum items for reimbursement of expenses from the previous year | 22.00 | 0.00% |
| 811100 | Proceeds from the sale of real estate | 4,358.00 | 0.41% |
| 812100 | Proceeds from the sale of movable property | 32.00 | 0.00% |
| 823100 | Proceeds from sale of goods for resale | 1,445.00 | 0.14% |
| Total revenues and income: | | 1,062,989.00 | 100.00% |

| Current expenses and expenditures: | | | |
|---|---|---|---|
| Code | Description | Amount | structure in% |
| 411100 | Salaries, allowances and employee benefits | 203,195.00 | 18.78% |
| 412100 | Pension and disability insurance contributions | 24,415.00 | 2.26% |
| 412200 | Health insurance contributions | 10,442.00 | 0.96% |
| 413100 | Fees in kind | 360.00 | 0.03% |
| 414100 | Payment of compensation during absence from work at the expense of funds | 161.00 | 0.01% |
| 414300 | Severance pay and benefits | 1,352.00 | 0.12% |
| 414400 | Assistance in medical treatment of the employee or close family members, and other assistance to the employee | 711.00 | 0.07% |
| 415100 | Employee benefits | 9,550.00 | 0.88% |

| | | | |
|---|---|---|---|
| 416100 | Employee awards and other special expenses | 2,799.00 | 0.26% |
| 421100 | Costs of payment transactions and banking services | 2,476.00 | 0.23% |
| 421200 | Energy services | 46,382.00 | 4.29% |
| 421300 | Communal services | 13,656.00 | 1.26% |
| 421400 | Communication services | 8,028.00 | 0.74% |
| 421500 | Insurance costs | 2,524.00 | 0.23% |
| 421600 | Lease of property and equipment | 2,358.00 | 0.22% |
| 421900 | Other expenses | 819.00 | 0.08% |
| 422100 | Expenses for business trips in the country | 1,846.00 | 0.17% |
| 422200 | Expenses for business trips abroad | 579.00 | 0.05% |
| 422300 | Travel expenses as part of regular work | 245.00 | 0.02% |
| 422400 | Student travel expenses | 184.00 | 0.02% |
| 422900 | Other transport costs | 94.00 | 0.01% |
| 423100 | Administrative services | 10,542.00 | 0.97% |
| 423200 | Computer services | 2,728.00 | 0.25% |
| 423300 | Employee education and training services | 2,141.00 | 0.20% |
| 423400 | Information services | 7,235.00 | 0.67% |
| 423500 | Professional services | 50,146.00 | 4.63% |
| 423600 | Household and catering services | 3,013.00 | 0.28% |
| 423700 | Representation | 7,121.00 | 0.66% |
| 423900 | Other general services | 9,359.00 | 0.86% |
| 424200 | Education, culture and sports services | 2,390.00 | 0.22% |
| 424300 | Medical services | 1,060.00 | 0.10% |
| 424400 | Highway maintenance services (local roads) | 51,511.00 | 4.76% |
| 424500 | Maintenance services of national parks and natural areas | 18,980.00 | 1.75% |
| 424600 | Environmental protection services, science and surveying services | 11,999.00 | 1.11% |
| 424900 | Other specialized services | 62,235.00 | 5.75% |
| 425100 | Ongoing repairs and maintenance of buildings and structures | 29,700.00 | 2.74% |
| 425200 | Ongoing repairs and maintenance of equipment | 4,954.00 | 0.46% |
| 426100 | Administrative material | 4,158.00 | 0.38% |
| 426200 | Material for agriculture | 173.00 | 0.02% |
| 426300 | Material for education and training of employees | 1,458.00 | 0.13% |
| 426400 | Traffic material | 6,834.00 | 0.63% |
| 426600 | Material for education, culture and sports | 4,785.00 | 0.44% |
| 426700 | Medical laboratory material | 82.00 | 0.01% |
| 426800 | Hygiene and catering material | 13,380.00 | 1.24% |
| 426900 | Material for other purposes | 8,862.00 | 0.82% |
| 441400 | Repayment of interest to domestic commercial banks | 1,177.00 | 0.11% |
| 444300 | Other ancillary borrowing costs | 75.00 | 0.01% |
| 454100 | Current subsidies to private companies | 15,750.00 | 1.46% |
| 463100 | Current transfers to other levels of government | 104,613.00 | 9.67% |
| 463200 | Capital transfers to other levels of government | 1,435.00 | 0.13% |
| 464100 | Ongoing grants to compulsory social security organizations | 3,899.00 | 0.36% |
| 465100 | Other current grants and transfers | 16,029.00 | 1.48% |
| 472300 | Budget benefits for children and family | 7,443.00 | 0.69% |

| | | | |
|---|---|---|---|
| 472700 | Fees from the budget for education, culture, science and sports | 32,885.00 | 3.04% |
| 472900 | Other fees from the budget | 26,501.00 | 2.45% |
| 481100 | Grants to non-profit organizations | 12,204.00 | 1.13% |
| 481900 | Grants to other non-profit institutions | 31,721.00 | 2.93% |
| 482100 | Other taxes | 164.00 | 0.02% |
| 482200 | Mandatory fees | 590.00 | 0.05% |
| 482300 | Fines and penalties | 142.00 | 0.01% |
| 483100 | Fines and penalties by court decision | 3,893.00 | 0.36% |
| 485100 | Compensation for injuries or damage caused by state authorities | 3,832.00 | 0.35% |
| 511200 | Construction of buildings and structures | 111,938.00 | 10.34% |
| 511300 | Capital maintenance of buildings and structures | 27,713.00 | 2.56% |
| 511400 | Project planning | 14,486.00 | 1.34% |
| 512100 | Traffic equipment | 498.00 | 0.05% |
| 512200 | Administrative equipment | 6,850.00 | 0.63% |
| 512600 | Equipment for education, science, culture and sports | 1,081.00 | 0.10% |
| 512800 | Public safety equipment | 159.00 | 0.01% |
| 512900 | Production equipment, motor, stationary and non-motor equipment | 443.00 | 0.04% |
| 513100 | Other real estate | 5,012.00 | 0.46% |
| 515100 | Intangible assets | 443.00 | 0.04% |
| 523100 | Stocks of goods for resale | 1,069.00 | 0.10% |
| 541100 | Land | 3,182.00 | 0.29% |
| Total current expenditures and expenses: | | 1,082,249.00 | 100.00% |

Article 5

In the consolidated report on capital expenditures and financing (Form 3) in the period from January 1 to December 31, 2019, the total income in the amount of 39,579 thousand dinars was determined. Total income is 39,579 thousand dinars and expenses for non-financial assets are 178,998 thousand dinars.

in 000 dinars

| Code | Description | Amount |
|---|---|---|
| Income: | | |
| 800000 | Proceeds from the sale of non-financial assets | 5,835 |
| 900000 | Income from borrowing and sale of financial assets | 33,744 |
| Total income: | | 39,579 |
| Expenditures: | | |
| 511000 | Buildings and structures | 154,137 |
| 512000 | Machinery and equipment | 9,031 |
| 513000 | Other real estate and equipment | 5012 |
| 515000 | Intangible assets | 443 |
| 523000 | Stocks of goods for resale | 1,069 |
| 541000 | Land | 3182 |
| 611000 | Repayment of principal to domestic creditors | 6,124 |
| Total expenses: | | 178,998 |
| Lack of income: | | -139,419 |

Article 7

In the consolidated statement of cash flows (Form 4) in the period from January 1 to December 31, 2019, the total cash inflows into the budget in the amount of 1,096,773 thousand dinars, cash outflows in the amount of 1,088,373 thousand and cash balance at the end of the year in the amount of 13,502 thousand dinars were determined.

in 000 dinars

| Code | Description | Amount | structure in% |
|---|---|---|---|
| | Cash balance at the beginning of the year | 9,171.00 | |
| Cash inflows: | | | |
| 710000 | Taxes | 574,821.00 | 53.05% |
| 730000 | Donations, aid and transfers | 376,973.00 | 35.62% |
| 740000 | Other income | 105,265.00 | 7.15% |
| 770000 | Memorandum items for refund | 95.00 | 0.84% |
| 810000 | Proceeds from the sale of fixed assets | 4,390.00 | 0.77% |
| 820000 | Proceeds from sale of inventories of goods | 1,445.00 | 0.12% |
| 910000 | Income from borrowing | 33,744.00 | |
| Total cash inflows | | 1,096,733.00 | 100.00% |
| Cash outflows: | | | |
| Code | Description | Amount | structure in% |
| 410000 | Employee expenses | 252,985.00 | 21.68% |
| 420000 | Use of services and goods | 394,037.00 | 35.99% |
| 440000 | Repayment of interest and accompanying borrowing costs | 1,252.00 | 0.05% |
| 450000 | Subsidies | 15,750.00 | 1.66% |
| 460000 | Donations, grants and transfers | 125,976.00 | 12.50% |
| 470000 | Social security and social protection | 66,829.00 | 9.22% |
| 480000 | Other expenses | 52,546.00 | 4.52% |
| 510000 | Fixed assets | 168,623.00 | 13.62% |
| 520000 | Supplies | 1,069.00 | |
| 540000 | Natural assets | 3,182.00 | 0.16% |
| 610000 | Principal repayment expenses | 6,124.00 | 0.46% |
| Total cash outflows | | 1,088,373.00 | 100.00% |
| Excess cash inflows | | 8,360.00 | |
| Adjustment of cash outflows for the amount of paid expenses that are not recorded over class 4,5, and 6 | | 4,290.00 | |
| Cash balance at the end of the year | | 13,502.00 | |

## 3.4 PUC Standard SID

### 3.4.1 Fiscal year 2016 (Departmental Expenses)

| Opis / Description | | Služba održavanja javnih površina<br>Public Area Maintenance Service | Služba održavanja jav.zelenih površina<br>Service for maintenance of public green areas | Služba Z00 higijene<br>ZOO hygiene Service | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme<br>Burial and cemetery maintenance service with a funeral shop | Služba parkiranja<br>Parking Service | Služba organizovanja pijace i vašara<br>Market and fair organization service | Služba iznošenja smeća<br>Waste collection service | Odeljenje za transport i održavanje<br>Department of Transport and Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| **Direktan trošak** | **Direct cost** | | | | | | | | |
| Materijal | Material | 173,392 | 571,896 | 272,883 | 117,886 | 206,948 | 57,209 | 592,301 | |
| Radni materijal (alat i inventar.) | Work Material | 3,115 | 249,033 | | 1,452,413 | 12,500 | 9,000 | 1,162,779 | |
| Gorivo | Fuel | | 1,126,705 | 128,036 | 183,833 | 12,779 | | 8,732,487 | |
| *Prosečna cena jedinice goriva* | *Average fuel unit price* | | | | | | | | |
| Nafta-ulje | Oil | | | | | | | | |
| Rezervni delovi | Spare Parts | | 1,849,609 | 321,058 | 4,533 | | | 4,210,082 | |
| Gume | Tires | 1,990 | 11,179 | | | | | 580,661 | |
| Potrošni materijal za opremu | Consumable for equipment | | | | | | | | |
| Plate | Salary | 7,251,684 | 7,731,948 | 1,149,420 | 4,685,364 | 4,015,741 | 4,700,757 | 14,765,352 | |
| Solidarna pomoć zaposlenima po odluci | Solidarity assistance to employees by decision | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Otpremnine zaposlenima | Severance pay to employees | | | | | | | 124,828 | |
| Solidarna pomoć zaposlenima u slučaju smrti užeg člana porodice | Solidarity assistance to employees in case of death of a close family member | | 6,000 | | | | | 6,000 | |
| Putni trošak | Travel expenses | 601,772 | 648,062 | 92,580 | 370,321 | 624,031 | 624,031 | 1,157,255 | |
| *Broj zaposlenih* | *Number of employee* | 13 | 14 | 2 | 8 | 7 | 7 | 25 | |
| *HTZ-oprema* | *HTZ equipment* | 62,796 | 71,996 | 5,816 | 81,554 | 109,053 | 9,516 | 1,237,988 | |
| Servisi | Sevices | | | | | | | | |
| Održavanje | Maintenance | | | | 1,245,092 | 61,349 | 544,188 | 6,191,600 | |
| Deponija | Landfill | | | | | | | | |
| **Ukupno direktnih troškova** | **Total of Direct cost** | **8,031,953** | **12,194,432** | **1,963,977** | **8,059,442** | **4,933,348** | **5,935,185** | **37,523,345** | **0** |
| **Indirektni troškovi** | **Indirect cost** | | | | | | | | |
| Administrativni materijal | Administrative Material | | | | | | | | |
| Struja | Electiricity | | | | 206,521 | 60,535 | 277,329 | | |
| Voda | Water | | | 1,491 | 100,542 | 18,382 | 120,130 | | |
| Telekominukacije | Telecominucation | 4,489 | 9,448 | 7,930 | 40,580 | 211,427 | 5,433 | 1,281,143 | |
| Seminar | Seminer | 0 | 0 | 0 | 0 | 0 | 0 | 20,570 | |
| Transport | Transport | | | | | | | | |
| Putovanje(putarine+Dnevnice) | Travel | | 15,120 | 4,050 | 1,600 | | | 155,550 | |
| Pokloni(jubilarne nagrade) | Gifts | | 14,000 | | | 14,000 | | 14,000 | |
| Službeni glasnik(časopisi,knjige, savetovanja) | Official gazette | | | | | | | 20,570 | |
| Naknade | Compensations | | | | | | | | |
| Zastupanje | Representation | | | | | | | | |
| Osiguranje(opreme i radnika) | Insurance | | | 14,982 | 18,666 | | | 780,195 | |
| Amortizacija osnovnih sredstava | | 4,935 | 237,700 | 29,725 | 251,276 | 24,400 | 41,544 | 1,886,756 | |
| Iznajmljivanje | Rent | | | | | | | | |
| Novčane kazne | Fines | | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Ukupan PDV | VAT | | | | | | | | 7,494,941 |
| Naknada članovima Nadzornog odbora | | | | | | | | | 607,600 |
| Porez | Tax | | | | | | | | |
| Porez na dohodak | Income Tax | | | | | | | | |
| Porez na imovinu | Property tax | | | | | | | | |
| Opštinski porez | Minucipality Tax | | | | | | | | |
| Drugo | Others | | | | | | | | |
| Licenca | Licence | | | | | | | | |
| Drugo-TAKSE,ŠTETA | Others | | | 55,390 | 41,513 | 71,373 | | 491,895 | |
| **Ukupno indirektnih troškova** | **Total of Indirect cost** | **9,424** | **276,268** | **113,568** | **660,698** | **400,117** | **444,436** | **4,650,679** | **8,102,541** |
| **Ukupno rashoda** | **Total of Expenditure** | **8,041,377** | **12,470,700** | **2,077,545** | **8,720,140** | **5,333,465** | **6,379,621** | **42,174,024** | **8,102,541** |
| | | | | | | | | | **93,299,413** |

NAPOMENA:OPŠTINSKI POREZ JE PDV-7.494.941,00

### 3.4.2 Fiscal year 2017 (Departmental Expenses)

| Opis / Description | | Služba održavanja javnih površina 13 | Služba održavanja jav.zelenih površina14 | Služba Z00 higijene 31 | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme 15 | Služba parkiranja 24 | Služba organizovanja pijace i vašara 16 | Služba iznošenja smeća 10 | Odeljenje za transport i održavanje |
|---|---|---|---|---|---|---|---|---|---|
| | | Public Area Maintenance Service | Service for maintenance of public green areas | ZOO hygiene Service | Burial and cemetery maintenance service with a funeral shop | Parking Service | Market and fair organization service | Waste collection service | Department of Transport and Maintenance |
| **Direktan trošak** | **Direct cost** | | | | | | | | |
| Materijal | Material | 160,915 | 199,494 | 353,525 | 61,297 | 176,585 | 9,540 | 477,311 | |
| Radni materijal (alat i inventar.) | Work Material | 53,477 | 369,482 | | 1,325,962 | 143,048 | 82,646 | 99,089 | |
| Gorivo | Fuel | 1,202 | 922,291 | 102,807 | 176,286 | | 11,000 | 7,198,574 | |
| *Prosečna cena jedinice goriva* | *Average fuel unit price* | | | | | | | | |
| Nafta-ulje | Oil | | | | | | | | |
| Rezervni delovi | Spare Parts | | 1,264,227 | 133,183 | 321,952 | | | 1,931,456 | |
| Gume | Tires | | | 19,200 | 34,400 | | | 375,284 | |
| Potrošni materijal za opremu | Consumable for equipment | | | | | | | | |
| Plate | Salary | 7,430,112 | 9,035,096 | 1,277,281 | 5,140,067 | 5,308,824 | 3,443,198 | 16,054,668 | |
| Solidarna pomoć zaposlenima po odluci | Solidarity assistance to employees by decision | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Otpremnine zaposlenima | Severance pay to employees | | | | | | 220,923 | | |
| Solidarna pomoć zaposlenima u slučaju smrti užeg člana porodice | Solidarity assistance to employees in case of death of a close family member | | | | | 34,786 | | | |
| Putni trošak | Travel expenses | 523,296 | 610,512 | 87,216 | 348,864 | 348,864 | 218,040 | 1,046,592 | |
| *Broj zaposlenih* | *Number of employee* | 12 | 14 | 2 | 8 | 8 | 5 | 24 | |
| *HTZ-oprema* | *HTZ equipment* | 43,350 | 77,100 | | 44,050 | | 33,750 | 477,255 | |
| Servisi | Sevices | | | | | | | | |
| Održavanje | Maintenance | | | | 162,300 | 840,980 | 145,000 | 5,669,620 | |
| Deponija | Landfill | | | | | | | | |
| **Ukupno direktnih troškova** | **Total of Direct cost** | **8,169,002** | **12,401,102** | **1,973,212** | **7,571,128** | **6,853,087** | **4,130,347** | **32,852,594** | **0** |
| **Indirektni troškovi** | **Indirect cost** | | | | | | | | |
| Administrativni materijal | Administrative Material | | | | | | | | |
| Struja | Electiricity | | | | 266,402 | 51,673 | 252,233 | | |
| Voda | Water | | | 5,702 | 58,881 | 7,238 | 273,844 | | |
| Telekominukacije | Telecominucation | | | 250 | 29,040 | 194,678 | 4,068 | 887,411 | |
| Seminar | Seminer | 0 | 0 | 0 | 12,000 | 0 | 0 | 0 | |
| Transport | Transport | | | | | | | | |
| Putovanje(putarine+Dnevnice) | Travel | | 8,680 | 960 | 7,230 | | | 120,690 | |
| Pokloni(jubilarne nagrade) | Gifts | 14,000 | | | | 14,000 | | | |
| Službeni glasnik(časopisi,knjige, savetovanja) | Official gazette | | | | | | | | |
| Naknade | Compensations | | | | | | | | |
| Zastupanje | Representation | | | | | | | | |
| Osiguranje(opreme i radnika) | Insurance | 30,168 | 35,085 | 43,569 | 49,762 | 16,244 | 9,282 | 521,285 | |
| Amortizacija osnovnih sredstava | | 4,935 | 428,658 | 84,838 | 438,011 | 24,400 | 30,791 | 2,188,843 | |
| Iznajmljivanje | Rent | | | | | | | | |
| Novčane kazne | Fines | | | | | | | | |

| Opis / Description | | Služba održavanja javnih površina 13 | Služba održavanja jav.zelenih površina14 | Služba Z00 higijene 31 | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme 15 | Služba parkiranja 24 | Služba organizovanja pijace i vašara 16 | Služba iznošenja smeća 10 | Odeljenje za transport i održavanje |
|---|---|---|---|---|---|---|---|---|---|
| | | Public Area Maintenance Service | Service for maintenance of public green areas | ZOO hygiene Service | Burial and cemetery maintenance service with a funeral shop | Parking Service | Market and fair organization service | Waste collection service | Department of Transport and Maintenance |
| Ukupan PDV | VAT | | | | | | | | 8,546,976 |
| Naknada članovima Nadzornog odbora | | | | | | | | | 607,600 |
| Porez | Tax | | | | | | | | |
| Porez na dohodak | Income Tax | | | | | | | | |
| Porez na imovinu | Property tax | | | | | | | | |
| Opštinski porez | Minucipality Tax | | | | | | | | |
| Drugo | Others | | | | | | | | |
| Licenca | Licence | | | | | | | | |
| Drugo-TAKSE,ŠTETA | Others | | 3,704 | 2,081,198 | 43,306 | 214,821 | 1,247 | 485,133 | |
| **Ukupno indirektnih troškova** | **Total of Indirect cost** | **49,103** | **476,127** | **2,216,517** | **904,632** | **523,054** | **571,465** | **4,203,362** | **9,154,576** |
| **Ukupno rashoda** | **Total of Expenditure** | **8,218,105** | **12,877,229** | **4,189,729** | **8,475,760** | **7,376,141** | **4,701,812** | **37,055,956** | **9,154,576** |
| | | | | | | | | | **92,049,308** |

### 3.4.3 Fiscal year 2018 (Departmental Expenses)

| Opis / Description | | Služba održavanja javnih površina<br>Public Area Maintenance Service | Služba održavanja jav.zelenih površina<br>Service for maintenance of public green areas | Služba Z00 higijene<br>ZOO hygiene Service | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme<br>Burial and cemetery maintenance service with a funeral shop | Služba parkiranja<br>Parking Service | Služba organizovanja pijace i vašara<br>Market and fair organization service | Služba iznošenja smeća<br>Waste collection service | Odeljenje za transport i održavanje<br>Department of Transport and Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| **Direktan trošak** | **Direct cost** | | | | | | | | |
| Materijal | Material | 118,175 | 146,450 | 419,149 | 103,086 | 171,618 | 66,718 | 499,209 | |
| Radni materijal (alat i inventar.) | Work Material | | 3,217 | 4,225 | 1,599,768 | 49,603 | 2,189 | 164,170 | |
| Gorivo | Fuel | | 987,750 | 105,671 | 152,808 | | | 8,064,687 | |
| *Prosečna cena jedinice goriva* | *Average fuel unit price* | | | | | | | | |
| Nafta-ulje | Oil | | | | | | | | |
| Rezervni delovi | Spare Parts | | 1,086,015 | 33,700 | 69,554 | | | 1,813,203 | |
| Gume | Tires | | 23,300 | | 1,070 | | | 655,141 | |
| Potrošni materijal za opremu | Consumable for equipment | | | | | | | | |
| Plate | Salary | 9,530,196 | 8,936,580 | 1,401,529 | 5,964,598 | 5,972,380 | 4,985,542 | 17,820,565 | |
| Solidarna pomoć zaposlenima po odluci | Solidarity assistance to employees by decision | 654,329 | 654,329 | 100,666 | 402,664 | 402,664 | 301,998 | 1,258,325 | |
| Otpremnine zaposlenima | Severance pay to employees | | | | | | | 207,036 | |
| Solidarna pomoć zaposlenima u slučaju smrti užeg člana porodice | Solidarity assistance to employees in case of death of a close family member | | | | | 37,900 | | 39,637 | |
| Putni trošak | Travel expenses | 566,904 | 566,904 | 98,216 | 348,864 | 34,864 | 261,648 | 1,090,200 | |
| *Broj zaposlenih* | *Number of employee* | 13 | 13 | 2 | 8 | 8 | 6 | 25 | |
| *HTZ-oprema* | *HTZ equipment* | | | | | | | | |
| Servisi | Sevices | | | | | | | | |
| Održavanje | Maintenance | | | 116,940 | 160,000 | | | 6,483,611 | |
| Deponija | Landfill | | | | | | | | |
| **Ukupno direktnih troškova** | **Total of Direct cost** | **10,869,604** | **12,404,545** | **2,280,096** | **8,802,412** | **6,669,029** | **5,618,095** | **38,095,784** | **0** |
| **Indirektni troškovi** | **Indirect cost** | | | | | | | | |
| Administrativni materijal | Administrative Material | | | | | | | | |
| Struja | Electiricity | | | | 205,795 | 17,280 | 260,363 | | |
| Voda | Water | | | 2,788 | 88,033 | 3,258 | 61,354 | 3,667 | |
| Telekominukacije | Telecominucation | | | 1,534 | 29,359 | 24,735 | 3,729 | 663,540 | |
| Seminar | Seminer | | | | | | | | |
| Transport | Transport | | | | | | | | |
| Putovanje(putarine+Dnevnice) | Travel | | 4,700 | 690 | 11,040 | | | 152,660 | |
| Pokloni(jubilarne nagrade) | Gifts | | | | | 57,000 | | 57,000 | |
| Službeni glasnik(časopisi,knjige, savetovanja) | Official gazette | | | 84,833 | | | | | |
| Naknade | Compensations | | | | | | | | |
| Zastupanje | Representation | | | | | | | | |
| Osiguranje(opreme i radnika) | Insurance | 14,859 | 28,918 | 19,116 | 21,721 | 9,144 | 6,858 | 246,809 | |
| Amortizacija osnovnih sredstava | | | 1,000,296 | 127,942 | 392,857 | 24,400 | 30,791 | 2,483,479 | |
| Iznajmljivanje | Rent | | | | | | | | |
| Novčane kazne | Fines | | | | | | | | |
| Ukupan PDV | VAT | | | | | | | | 11,515,950 |

| Opis / Description | | Služba održavanja javnih površina<br>Public Area Maintenance Service | Služba održavanja jav.zelenih površina<br>Service for maintenance of public green areas | Služba Z00 higijene<br>ZOO hygiene Service | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme<br>Burial and cemetery maintenance service with a funeral shop | Služba parkiranja<br>Parking Service | Služba organizovanja pijace i vašara<br>Market and fair organization service | Služba iznošenja smeća<br>Waste collection service | Odeljenje za transport i održavanje<br>Department of Transport and Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| Naknada članovima Nadzornog odbora | | | | | | | | | 607,602 |
| Porez | Tax | | | | | | | | |
| Porez na dohodak | Income Tax | | | | | | | | |
| Porez na imovinu | Property tax | | | | | | | | |
| Opštinski porez | Minucipality Tax | | | | | | | | |
| Drugo | Others | | | | | | | | |
| Licenca | Licence | | | | | | | | |
| Drugo-TAKSE,ŠTETA | Others | | 3,944 | 3,178,271 | 211,563 | 128,565 | | 528,484 | |
| **Ukupno indirektnih troškova** | **Total of Indirect cost** | **14,859** | **1,037,858** | **3,415,174** | **960,368** | **264,382** | **363,095** | **4,135,639** | **12,123,552** |
| **Ukupno rashoda** | **Total of Expenditure** | **10,884,463** | **13,442,403** | **5,695,270** | **9,762,780** | **6,933,411** | **5,981,190** | **42,231,423** | **12,123,552** |
| | | | | | | | | | **107,054,492** |

### 3.4.4 Fiscal year 2019 (Departmental Expenses)

| Opis / Description | | Služba održavanja javnih površina | Služba održavanja jav.zelenih površina | Služba Z00 higijene | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme | Služba parkiranja | Služba organizovanja pijace i vašara | Služba iznošenja smeća | Odeljenje za transport i održavanje |
|---|---|---|---|---|---|---|---|---|---|
| | | Public Area Maintenance Service | Service for maintenance of public green areas | ZOO hygiene Service | Burial and cemetery maintenance service with a funeral shop | Parking Service | Market and fair organization service | Waste collection service | Department of Transport and Maintenance |
| **Direktan trošak** | **Direct cost** | | | | | | | | |
| Materijal | Material | 212,214 | 869,328 | 901,891 | 67,704 | 171,877 | 246,526 | 608,229 | |
| Radni materijal (alat i inventar.) | Work Material | 225,000 | 114,286 | 35,000 | 1,562,260 | 0 | 20,277 | 230,878 | |
| Gorivo | Fuel | | 896,482 | 108,686 | 109,228 | | 9,389 | 9,085,297 | |
| *Prosečna cena jedinice goriva* | *Average fuel unit price* | | | | | | | | |
| Nafta-ulje | Oil | | | | | | | | |
| Rezervni delovi | Spare Parts | 116,656 | 808,423 | 9,800 | 33,000 | | | 2,498,524 | |
| Gume | Tires | | | 16,500 | | | | 153,333 | |
| Potrošni materijal za opremu | Consumable for equipment | | | | | | | | |
| Plate | Salary | 7,970,556 | 11,973,780 | 1,659,696 | 6,307,452 | 6,810,684 | 4,949,016 | 20,834,412 | |
| Solidarna pomoć zaposlenima po odluci | Solidarity assistance to employees by decision | 503,330 | 603,996 | 150,999 | 503,330 | 352,331 | 100,666 | 1,207,992 | |
| Otpremnine zaposlenima | Severance pay to employees | 209,847 | 228,168 | | | | 216,501 | | |
| Solidarna pomoć zaposlenima u slučaju smrti užeg člana porodice | Solidarity assistance to employees in case of death of a close family member | 20,000 | 42,233 | | 49,713 | | 39,713 | | |
| Putni trošak | Travel expenses | 625,800 | 876,120 | 125,160 | 500,640 | 500,640 | 312,900 | 1,501,920 | |
| *Broj zaposlenih* | *Number of employee* | 10 | 14 | 2 | 8 | 8 | 5 | 24 | |
| *HTZ-oprema* | *HTZ equipment* | | | | | | | | |
| Servisi | Sevices | | | | | | | | |
| Održavanje | Maintenance | | | | | | | 180,000 | |
| Deponija | Landfill | | | | | | | | |
| **Ukupno direktnih troškova** | **Total of Direct cost** | **9,883,403** | **16,412,816** | **3,007,732** | **9,133,327** | **7,835,532** | **5,894,988** | **36,300,585** | **0** |
| **Indirektni troškovi** | **Indirect cost** | | | | | | | | |
| Administrativni materijal | Administrative Material | | | | | | | | |
| Struja | Electiricity | | | | 281,209 | 116,853 | 269,547 | | |
| Voda | Water | | | 1,100 | 90,803 | 3,070 | 55,746 | 36,769 | |
| Telekominukacije | Telecominucation | | | 1,390 | 32,346 | 27,221 | 4,068 | 526,301 | |
| Seminar | Seminer | | | 33,333 | | | | | |
| Transport | Transport | | | | | | | | |
| Putovanje(putarine+Dnevnice) | Travel | 0 | 3,080 | 5,450 | 3,070 | 0 | 0 | 152,755 | |
| Pokloni(jubilarne nagrade) | Gifts | 19,000 | | | | | | 38,000 | |
| Službeni glasnik(časopisi,knjige, savetovanja) | Official gazette | | | | | | | | |
| Naknade | Compensations | | | | | | | | |
| Zastupanje | Representation | | | | | | | | |
| Osiguranje(opreme i radnika) | Insurance | 12,540 | 17,556 | 18,452 | 21,911 | 10,032 | 6,270 | 189,908 | |
| Amortizacija osnovnih sredstava | | 0 | 836,852 | 298,960 | 392,857 | 24,400 | 30,791 | 2,126,895 | |
| Iznajmljivanje | Rent | | | | | | | | |
| Novčane kazne | Fines | | | | | | | | |
| Ukupan PDV | VAT | | | | | | | | 8,492,570 |

| Opis / Description | | Služba održavanja javnih površina<br>Public Area Maintenance Service | Služba održavanja jav.zelenih površina<br>Service for maintenance of public green areas | Služba Z00 higijene<br>ZOO hygiene Service | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme<br>Burial and cemetery maintenance service with a funeral shop | Služba parkiranja<br>Parking Service | Služba organizovanja pijace i vašara<br>Market and fair organization service | Služba iznošenja smeća<br>Waste collection service | Odeljenje za transport i održavanje<br>Department of Transport and Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| Naknada članovima Nadzornog odbora | | | | | | | | | 514,434 |
| Porez | Tax | | | | | | | | |
| Porez na dohodak | Income Tax | | | | | | | | |
| Porez na imovinu | Property tax | | | | | | | | |
| Opštinski porez | Minucipality Tax | | | | | | | | |
| Drugo | Others | | | | | | | | |
| Licenca | Licence | | | | | | | | |
| Drugo-TAKSE,ŠTETA | Others | | 11,450 | 4,061,663 | 139,847 | 70,000 | 5,651 | 176,741 | |
| **Ukupno indirektnih troškova** | **Total of Indirect cost** | **31,540** | **868,938** | **4,420,348** | **962,043** | **251,576** | **372,073** | **3,247,369** | **9,007,004** |
| **Ukupno rashoda** | **Total of Expenditure** | **9,914,943** | **17,281,754** | **7,428,080** | **10,095,370** | **8,087,108** | **6,267,061** | **39,547,954** | **9,007,004** |
| | | | | | | | | | **107,629,274** |

### 3.4.5 Fiscal year 2020 (Departmental Expenses)

| Opis / Description | | Služba održavanja javnih površina<br>Public Area Maintenance Service | Služba održavanja jav.zelenih površina<br>Service for maintenance of public green areas | Služba Z00 higijene<br>ZOO hygiene Service | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme<br>Burial and cemetery maintenance service with a funeral shop | Služba parkiranja<br>Parking Service | Služba organizovanja pijace i vašara<br>Market and fair organization service | Služba iznošenja smeća<br>Waste collection service | Odeljenje za transport i održavanje<br>Department of Transport and Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| **Direktan trošak** | **Direct cost** | | | | | | | | |
| Materijal | Material | 220,060 | 620,354 | 753,672 | 43,670 | 79,358 | 19,440 | 570,334 | |
| Radni materijal (alat i inventar.) | Work Material | 86,800 | 87,680 | 43,162 | 1,621,209 | 37,064 | | 172,802 | |
| Gorivo | Fuel | | 787,502 | 110,677 | 144,832 | | | 8,031,372 | |
| *Prosečna cena jedinice goriva* | *Average fuel unit price* | | | | | | | | |
| Nafta-ulje | Oil | | | | | | | | |
| Rezervni delovi | Spare Parts | | 1,202,197 | 10,900 | 34,450 | | | 2,563,707 | |
| Gume | Tires | | 13,592 | 7,200 | | | | 363,208 | |
| Potrošni materijal za opremu | Consumable for equipment | | | | | | | | |
| Plate | Salary | 11,037,204 | 10,882,920 | 2,914,859 | 9,063,648 | 6,548,180 | 2,354,280 | 22,438,716 | |
| Solidarna pomoć zaposlenima po odluci | Solidarity assistance to employees by decision | 603,996 | 603,996 | 150,999 | 503,330 | 352,331 | 100,666 | 1,207,992 | |
| Otpremnine zaposlenima | Severance pay to employees | | | | | | 246,960 | 735,744 | |
| Solidarna pomoć zaposlenima u slučaju smrti užeg člana porodice | Solidarity assistance to employees in case of death of a close family member | 46,993 | 46,841 | | 46,018 | 45,451 | | 93,531 | |
| Putni trošak | Travel expenses | 846,432 | 846,432 | 211,608 | 705,360 | 493,752 | 141,072 | 1,692,864 | |
| *Broj zaposlenih* | *Number of employee* | 12 | 12 | 3 | 10 | 7 | 2 | 24 | |
| *HTZ-oprema* | *HTZ equipment* | | | | | | | | |
| Servisi | Sevices | | | | | | | | |
| Održavanje | Maintenance | | 21,000 | | 245,000 | | 16,850 | 5,516,100 | |
| Deponija | Landfill | | | | | | | | |
| **Ukupno direktnih troškova** | **Total of Direct cost** | **12,841,485** | **15,112,514** | **4,203,077** | **12,407,517** | **7,556,136** | **2,879,268** | **43,386,370** | **0** |
| **Indirektni troškovi** | **Indirect cost** | | | | | | | | |
| Administrativni materijal | Administrative Material | | | | | | | | |
| Struja | Electiricity | | | | 316,906 | 159,131 | 44,089 | | |
| Voda | Water | | | 1,500 | 149,841 | 1,760 | 53,169 | 113,421 | |
| Telekominukacije | Telecominucation | | | | 34,394 | 92,195 | 4,407 | 628,056 | |
| Seminar | Seminer | | | | | | | | |
| Transport | Transport | | | | | | | | |
| Putovanje(putarine+Dnevnice) | Travel | | 1,710 | 1,020 | 9,080 | | 2,000 | 117,093 | |
| Pokloni(jubilarne nagrade) | Gifts | | 88,730 | | 44,365 | | 44,365 | | |
| Službeni glasnik(časopisi,knjige, savetovanja) | Official gazette | | | | | 41,980 | | 190,000 | |
| Naknade | Compensations | | | | | | | | |
| Zastupanje | Representation | | | | | | | | |
| Osiguranje(opreme i radnika) | Insurance | 16,056 | 64,951 | 19,072 | 54,168 | 9,366 | 2,676 | 195,475 | |
| Amortizacija osnovnih sredstava | | | 1,837,704 | 269,235 | 499,166 | 24,400 | 30,791 | 2,448,777 | |
| Iznajmljivanje | Rent | | | | | | | | |
| Novčane kazne | Fines | | | | | | | | |
| Ukupan PDV | VAT | | | | | | | | 8,467,456 |
| Naknada članovima Nadzornog odbora | Remuneration to members of the Supervisory Board | | | | | | | | 384,000 |

| Opis / Description | | Služba održavanja javnih površina<br>Public Area Maintenance Service | Služba održavanja jav.zelenih površina<br>Service for maintenance of public green areas | Služba Z00 higijene<br>ZOO hygiene Service | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme<br>Burial and cemetery maintenance service with a funeral shop | Služba parkiranja<br>Parking Service | Služba organizovanja pijace i vašara<br>Market and fair organization service | Služba iznošenja smeća<br>Waste collection service | Odeljenje za transport i održavanje<br>Department of Transport and Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| Porez | Tax | | | | | | | | |
| Porez na dohodak | Income Tax | | | | | | | | |
| Porez na imovinu | Property tax | | | | | | | | |
| Opštinski porez | Municipality Tax | | | | | | | | |
| Drugo | Others | | | | | | | | |
| Licenca | License | | | | | | | | |
| Drugo-TAKSE,ŠTETA | Others | | 10,528 | 3,406,587 | 165,685 | 8,628 | 0 | 230,245 | |
| **Ukupno indirektnih troškova** | **Total of Indirect cost** | **16,056** | **2,003,623** | **3,697,414** | **1,273,605** | **337,460** | **181,497** | **3,923,067** | **8,851,456** |
| **Ukupno rashoda** | **Total of Expenditure** | **12,857,541** | **17,116,137** | **7,900,491** | **13,681,122** | **7,893,596** | **3,060,765** | **47,309,437** | **8,851,456** |
| | | | | | | | | | **118,670,545** |

### 3.4.6 Fiscal year 2016 (Departmental income)

| Opis / Description | | Služba održavanja javnih površina<br>Public Area Maintenance Service | Služba održavanja jav.zelenih površina<br>Service for maintenance of public green areas | Služba Z00 higijene<br>ZOO hygiene Service | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme<br>Burial and cemetery maintenance service with a funeral shop | Služba parkiranja<br>Parking Service | Služba organizovanja pijace i vašara<br>Market and fair organization service | Služba iznošenja smeća<br>Waste collection service | Odeljenje za transport i održavanje<br>Department of Transport and Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| **Usluga sakupljanja otpada** | **Waste collection service** | | | | | | | | |
| Domaćinstva-Fizička lica | Household | | | | | | | | |
| Broj klijenta | Number of Client | | | | | | | 10,066 | |
| Iznos naplate-prihod | Amount of Billing | | | | | | | 49,279,426 | |
| Iznos prikupljenog | Amount of Collected | | | | | | | 43,982,221 | |
| Firme-Društveni sektor | Business | | | | | | | | |
| Broj klijenta | Number of Client | | | | | | | 560 | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | 9,576,857 | |
| Institucije | Institution | | | | | | | | |
| Broj klijenta | Number of Client | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| Drugo-donacija | Others | | | | | | | 38,107,390 | |
| **Čišćenje puteva** | **Road Sweeping** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | 14,042,040 | 15,492,965 | | | | | | |
| **Čišćenje groblja** | **Cemetery cleaning** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| **Čišćenje divljeg odlaganja** | **Cleaning of illegal dumping** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| **Čišćenje snega** | **Snow clearing** | | | | | | | | |
| Iznos naplate-cena | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| **Sahranjivanje** | **Burial work** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | 11,568,576 | | | | |
| **Pogrebna radnja** | **Funeral shop** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| **Parking servis** | **Parking Service** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog-prihod | Amount of Collected | | | | | 5,932,986 | | | |
| **Usluga tržišta i poštene organizacije-takse i rezervacije pijačarskih i vašarskih tezgi** | **Market service and fair organization-taxes and reservations of market and fair stalls** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | 9,183,389 | | |

| Opis / Description | | Služba održavanja javnih površina<br>Public Area Maintenance Service | Služba održavanja jav.zelenih površina<br>Service for maintenance of public green areas | Služba Z00 higijene<br>ZOO hygiene Service | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme<br>Burial and cemetery maintenance service with a funeral shop | Služba parkiranja<br>Parking Service | Služba organizovanja pijace i vašara<br>Market and fair organization service | Služba iznošenja smeća<br>Waste collection service | Odeljenje za transport i održavanje<br>Department of Transport and Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| **Usluga zoohigijene** | **Zoohygiene service** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | 3,015,261 | | | | | |
| **Drugo-zakup lokala na pijaci** | **Others** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | 211,755 | | |
| **Ukupno prihoda** | **Total of Income** | **14,042,040** | **15,492,965** | **3,015,261** | **11,568,576** | **5,932,986** | **9,395,144** | **91,666,468** | **0** |
| | | | | | | | | | **151,113,440** |

### 3.4.7 Fiscal year 2017 (Departmental income)

| Opis / Description | | Služba održavanja javnih površina<br>Public Area Maintenance Service | Služba održavanja jav.zelenih površina<br>Service for maintenance of public green areas | Služba Z00 higijene<br>ZOO hygiene Service | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme<br>Burial and cemetery maintenance service with a funeral shop | Služba parkiranja<br>Parking Service | Služba organizovanja pijace i vašara<br>Market and fair organization service | Služba iznošenja smeća<br>Waste collection service | Odeljenje za transport i održavanje<br>Department of Transport and Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| **Usluga sakupljanja otpada** | **Waste collection service** | | | | | | | | |
| Domaćinstva-Fizička lica | Household | | | | | | | | |
| Broj klijenta | Number of Client | | | | | | | 9,951 | |
| Iznos naplate | Amount of Billing | | | | | | | 54,590,648 | |
| Iznos prikupljenog | Amount of Collected | | | | | | | 49,137,698 | |
| Firme-Društveni sektor | Business | | | | | | | | |
| Broj klijenta | Number of Client | | | | | | | 590 | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Fakturisano | Amount of Collected | | | | | | | 12,105,148 | |
| Iznos prikupljenog | Institution | | | | | | | | |
| Institucija | Number of Client | | | | | | | | |
| Broj klijenta | Amount of Billing | | | | | | | | |
| Iznos naplate | Amount of Collected | | | | | | | | |
| Iznos prikupljenog | Others | | | | | | | | |
| **Drugi-donacija** | **Road Sweeping** | | | | | | | | |
| Metenje puteva | Amount of Billing | | | | | | | | |
| Iznos naplate | Amount of Collected | 9,637,990 | 15,034,851 | | | | | 12,498,400 | |
| **Iznos prikupljenog** | **Cemetery cleaning** | | | | | | | | |
| Čišćenje groblja | Amount of Billing | | | | | | | | |
| Iznos naplate | Amount of Collected | | | | | | | | |
| **Iznos prikupljenog** | **Cleaning of illegal dumping** | | | | | | | | |
| Čišćenje divljeg odlaganja | Amount of Billing | | | | | | | | |
| Iznos naplate | Amount of Collected | | | | | | | | |
| **Iznos prikupljenog** | **Snow clearing** | | | | | | | | |
| Čišćenje snega | Amount of Billing | | | | | | | | |
| Iznos naplate | Amount of Collected | | | | | | | | |
| **Iznos prikupljenog** | **Burial work** | | | | | | | | |
| Sahranjivanje | Amount of Billing | | | | | | | | |
| Iznos naplate | Amount of Collected | | | | 10,967,492 | | | | |
| **Iznos prikupljenog** | **Funeral shop** | | | | | | | | |
| Pogrebna radnja | Amount of Billing | | | | | | | | |
| Iznos naplate | Amount of Collected | | | | | | | | |
| **Iznos prikupljenog** | **Parking Service** | | | | | | | | |
| Parking servis | Amount of Billing | | | | | | | | |
| Iznos naplate | Amount of Collected | | | | | 5,543,407 | | | |
| **Iznos prikupljenog** | **Market service and fair organization-taxes and reservations of market and fair stalls** | | | | | | | | |
| Usluga tržišta i poštene organizacije-takse i rezervacije pijačarskih i vašarskih tezgi | Amount of Billing | | | | | | | | |

| Opis / Description | | Služba održavanja javnih površina<br>Public Area Maintenance Service | Služba održavanja jav.zelenih površina<br>Service for maintenance of public green areas | Služba Z00 higijene<br>ZOO hygiene Service | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme<br>Burial and cemetery maintenance service with a funeral shop | Služba parkiranja<br>Parking Service | Služba organizovanja pijace i vašara<br>Market and fair organization service | Služba iznošenja smeća<br>Waste collection service | Odeljenje za transport i održavanje<br>Department of Transport and Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| Iznos naplate | Amount of Collected | | | | | | 9,009,428 | | |
| **Iznos prikupljenog** | **Zoohygiene service** | | | | | | | | |
| Usluga zoohigijene | Amount of Billing | | | | | | | | |
| Iznos naplate | Amount of Collected | | | 2,005,582 | | | | | |
| **Iznos prikupljenog** | **Others** | | | | | | | | |
| Drugo-zakup lokala na pijaci | Amount of Billing | | | | | | | | |
| Iznos naplate | Amount of Collected | | | | | | 102,308 | | |
| **Ukupno prihoda** | **Total of Income** | **9,637,990** | **15,034,851** | **2,005,582** | **10,967,492** | **5,543,407** | **9,111,736** | **73,741,246** | **0** |
| | | | | | | | | | **126,042,304** |

### 3.4.8 Fiscal year 2018 (Departmental income)

| Opis / Description | | Služba održavanja javnih površina<br>Public Area Maintenance Service | Služba održavanja jav.zelenih površina<br>Service for maintenance of public green areas | Služba Z00 higijene<br>ZOO hygiene Service | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme<br>Burial and cemetery maintenance service with a funeral shop | Služba parkiranja<br>Parking Service | Služba organizovanja pijace i vašara<br>Market and fair organization service | Služba iznošenja smeća<br>Waste collection service | Odeljenje za transport i održavanje<br>Department of Transport and Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| **Usluga sakupljanja otpada** | **Waste collection service** | | | | | | | | |
| Domaćinstva-Fizička lica | Household | | | | | | | | |
| Broj klijenta | Number of Client | | | | | | | 9,774 | |
| Iznos naplate | Amount of Billing | | | | | | | 57,363,263 | |
| Iznos prikupljenog | Amount of Collected | | | | | | | 51,581,976 | |
| Firme-Društveni sektor | Business | | | | | | | | |
| Broj klijenta | Number of Client | | | | | | | 598 | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | 13,654,728 | |
| Institucija | Institution | | | | | | | | |
| Broj klijenta | Number of Client | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| Drugi-donacija | Others | | | 513,503 | | | | 6,136,364 | |
| **Metenje puteva** | **Road Sweeping** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | 14,627,707 | 17,019,651 | | | | | | |
| **Čišćenje groblja** | **Cemetery cleaning** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| **Čišćenje divljeg odlaganja** | **Cleaning of illegal dumping** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| **Čišćenje snega** | **Snow clearing** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| **Sahranjivanje** | **Burial work** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | 12,824,198 | | | | |
| **Pogrebna radnja** | **Funeral shop** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| **Parking servis** | **Parking Service** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | 5,083,773 | | | |
| **Usluga tržišta i poštene organizacije-takse i rezervacije pijačarskih i vašarskih tezgi** | **Market service and fair organization-taxes and reservations of market and fair stalls** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | 7,035,532 | | |

| Opis / Description | | Služba održavanja javnih površina<br>Public Area Maintenance Service | Služba održavanja jav.zelenih površina<br>Service for maintenance of public green areas | Služba Z00 higijene<br>ZOO hygiene Service | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme<br>Burial and cemetery maintenance service with a funeral shop | Služba parkiranja<br>Parking Service | Služba organizovanja pijace i vašara<br>Market and fair organization service | Služba iznošenja smeća<br>Waste collection service | Odeljenje za transport i održavanje<br>Department of Transport and Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| **Usluga zoohigijene** | **Zoohygiene service** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| **Drugo-zakup lokala na pijaci** | **Others** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | 91,263 | | |
| **Ukupno prihoda** | **Total of Income** | **14,627,707** | **17,019,651** | **513,503** | **12,824,198** | **5,083,773** | **7,126,795** | **71,373,068** | **0** |
| | | | | | | | | | **128,568,695** |

### 3.4.9 Fiscal year 2019 (Departmental income)

| Opis / Description | | Služba održavanja javnih površina<br>Public Area Maintenance Service | Služba održavanja jav.zelenih površina<br>Service for maintenance of public green areas | Služba Z00 higijene<br>ZOO hygiene Service | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme<br>Burial and cemetery maintenance service with a funeral shop | Služba parkiranja<br>Parking Service | Služba organizovanja pijace i vašara<br>Market and fair organization service | Služba iznošenja smeća<br>Waste collection service | Odeljenje za transport i održavanje<br>Department of Transport and Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| **Usluga sakupljanja otpada** | **Waste collection service** | | | | | | | | |
| Domaćinstva-Fizička lica | Household | | | | | | | | |
| Broj klijenta | Number of Client | | | | | | | 9,621 | |
| Iznos naplate | Amount of Billing | | | | | | | 58,910,150 | |
| Iznos prikupljenog | Amount of Collected | | | | | | | 54,051,359 | |
| Firme-Društveni sektor | Business | | | | | | | | |
| Broj klijenta | Number of Client | | | | | | | 582 | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | 13,945,242 | |
| Institucija | Institution | | | | | | | | |
| Broj klijenta | Number of Client | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| Drugi-donacija | Others | | | | | | | | |
| **Metenje puteva** | **Road Sweeping** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | 10,661,784 | 9,122,858 | | | | | | |
| **Čišćenje groblja** | **Cemetery cleaning** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| **Čišćenje divljeg odlaganja** | **Cleaning of illegal dumping** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| **Čišćenje snega** | **Snow clearing** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| **Sahranjivanje** | **Burial work** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | 15,471,190 | | | | |
| **Pogrebna radnja** | **Funeral shop** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| **Parking servis** | **Parking Service** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | 5,020,994 | | | |
| **Usluga tržišta i poštene organizacije-takse i rezervacije pijačarskih i vašarskih tezgi** | **Market service and fair organization-taxes and reservations of market and fair stalls** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | 8,069,420 | | |
| **Usluga zoohigijene** | **Zoohygiene service** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |

| Opis / Description | | Služba održavanja javnih površina<br>Public Area Maintenance Service | Služba održavanja jav.zelenih površina<br>Service for maintenance of public green areas | Služba Z00 higijene<br>ZOO hygiene Service | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme<br>Burial and cemetery maintenance service with a funeral shop | Služba parkiranja<br>Parking Service | Služba organizovanja pijace i vašara<br>Market and fair organization service | Služba iznošenja smeća<br>Waste collection service | Odeljenje za transport i održavanje<br>Department of Transport and Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| Iznos prikupljenog | Amount of Collected | | 77,013 | | | | | | |
| **Drugo-zakup lokala na pijaci** | **Others** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | 98,400 | | |
| **Ukupno prihoda** | **Total of Income** | **10,661,784** | **9,199,871** | **0** | **15,471,190** | **5,020,994** | **8,167,820** | **67,996,601** | **0** |
| | | | | | | | | | **116,518,260** |

### 3.4.10 Fiscal year 2020 (Departmental income)

| Opis / Description | | Služba održavanja javnih površina | Služba održavanja jav.zelenih površina | Služba Z00 higijene | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme | Služba parkiranja | Služba organizovanja pijace i vašara | Služba iznošenja smeća | Odeljenje za transport i održavanje |
|---|---|---|---|---|---|---|---|---|---|
| | | Public Area Maintenance Service | Service for maintenance of public green areas | ZOO hygiene Service | Burial and cemetery maintenance service with a funeral shop | Parking Service | Market and fair organization service | Waste collection service | Department of Transport and Maintenance |
| **Usluga sakupljanja otpada** | **Waste collection service** | | | | | | | | |
| Domaćinstva-Fizička lica | Household | | | | | | | | |
| Broj klijenta | Number of Client | | | | | | | 9,733 | |
| Iznos naplate | Amount of Billing | | | | | | | 60,656,065 | |
| Iznos prikupljenog | Amount of Collected | | | | | | | 58,710,382 | |
| Firme-Društveni sektor | Business | | | | | | | | |
| Broj klijenta | Number of Client | | | | | | | 570 | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | 14,394,941 | |
| Institucija | Institution | | | | | | | | |
| Broj klijenta | Number of Client | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| Drugi-donacija | Others | | | | | | | | |
| **Metenje puteva** | **Road Sweeping** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | 9,338,780 | 7,897,308 | | | | | | |
| **Čišćenje groblja** | **Cemetery cleaning** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| **Čišćenje divljeg odlaganja** | **Cleaning of illegal dumping** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| **Čišćenje snega** | **Snow clearing** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| **Sahranjivanje** | **Burial work** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | 13,408,745 | | | | |
| **Pogrebna radnja** | **Funeral shop** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | | | |
| **Parking servis** | **Parking Service** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | 4,093,902 | | | |
| **Usluga tržišta i poštene organizacije-takse i rezervacije pijačarskih i vašarskih tezgi** | **Market service and fair organization-taxes and reservations of market and fair stalls** | | | | | | | | |

| Opis / Description | | Služba održavanja javnih površina<br>Public Area Maintenance Service | Služba održavanja jav.zelenih površina<br>Service for maintenance of public green areas | Služba Z00 higijene<br>ZOO hygiene Service | Služba sahranjivanja i održ.grobalja sa prodavnicom pogrebne orpeme<br>Burial and cemetery maintenance service with a funeral shop | Služba parkiranja<br>Parking Service | Služba organizovanja pijace i vašara<br>Market and fair organization service | Služba iznošenja smeća<br>Waste collection service | Odeljenje za transport i održavanje<br>Department of Transport and Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | 2,952,738 | | |
| **Usluga zoohigijene** | **Zoohygiene service** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | 4,923,924 | | | | | |
| **Drugo-zakup lokala na pijaci** | **Others** | | | | | | | | |
| Iznos naplate | Amount of Billing | | | | | | | | |
| Iznos prikupljenog | Amount of Collected | | | | | | 98,400 | | |
| **Ukupno prihoda** | **Total of Income** | **9,338,780** | **7,897,308** | **4,923,924** | **13,408,745** | **4,093,902** | **3,051,138** | **73,105,323** | **0** |
| | | | | | | | | | **115,819,120** |

## 3.5 PUC price table (Fiscal year 2021)

**Price list for the lease of fairgrounds for 2020**

| Serial number | Position and zone of the place | Unit | price without VAT |
|---|---|---|---|
| 1 | Area for caterers zone 1 | pcs | 16,958.34 |
| 2 | Area for caterers zone 2 | pcs | 8,708.34 |
| 3 | Places along the lanes zone 1 | pcs | 16,041.66 |
| 4 | Places along the lanes zone 2 | pcs | 11,916.66 |
| 5 | Green area zone 1 | pcs | 7,089.50 |
| 6 | Green area zone 2 | pcs | 3,546.40 |
| 7 | Tractor outlets | pcs | 6,249.53 |

**Price list of chimney sweeping services in 2021**

| Number | Type of service | Unit | Price without VAT |
|---|---|---|---|
| 1 | Chimney cleaning (private houses) | pcs | 752.04 |
| 2 | Chimney-floor cleaning in a collective apartment | pcs | 220.66 |
| 3 | Factory chimney cleaning per 1m | m | 331.00 |
| 4 | Cleaning chimneys for central heating in the household | pcs | 882.65 |
| 5 | Chimney cleaning for central heating | pcs | 882.65 |
| 6 | Stove cleaning | pcs | 441.34 |
| 7 | Pipe cleaning per meter | m | 176.52 |
| 8 | Bakery cleaning per dowel | pcs | 882.65 |
| 9 | Chimney unclogging per hour | hour | 331.00 |
| 10 | Chimney firing per hour | hour | 331.00 |
| 11 | Extracting soot from chimneys per hour | hour | 331.00 |
| 12 | Cleaning annealed pipes | m | 44.13 |
| 13 | Working hour | hour | 441.34 |
| 14 | Not included in the price list - working hour | hour | 441.34 |

**PRICE LIST FOR CLEANING SERVICES IN 2021**

| Number | Type of service | Unit | Price without VAT |
|---|---|---|---|
| 1 | Street cleaning | $m^2$ | 1.48 |
| 2 | Machine cleaning for customs crossings | $m^2$ | 14.53 |
| 3 | Collection of paper and waste | $m^2$ | 0.38 |
| 4 | Shoveling snow | $m^2$ | 4.12 |
| 5 | Technical salt sprinkling | $m^2$ | 0.38 |
| 6 | Ice breaking | $m^2$ | 6.85 |
| 7 | Emptying trash cans | pcs | 136.92 |

**Price list of funeral services for 2021**

| Number | Type of service | Unit | Price without VAT |
|---|---|---|---|
| 1 | Burial of the deceased in the grave | body | 11,584.89 |
| 2 | Burial of the deceased in the tomb | body | 7,778.42 |
| 3 | Use of the chapel | day | 3,089.33 |
| 4 | Regular exhumation from the grave | body | 12,845.83 |
| 5 | Regular exhumation from the tomb | body | 11,821.32 |
| 6 | Extraordinary exhumation from the grave (before the end of the first year) | body | 25,691.67 |

| | | | |
|---|---|---|---|
| 7 | Extraordinary exhumation from the tomb (before the end of the first year) | body | 23,642.63 |
| 8 | Extraordinary exhumation from the grave (after the first and before the end of the tenth year) | body | 13,003.46 |
| 9 | Extraordinary exhumation from the tomb (after the first and before the end of the tenth year) | body | 17,731.97 |
| 10 | Transport by court order on the territory of the Municipality of Sid (up to 3 hours) | hour | 3,507.00 |
| 11 | Every next hour of waiting | hour | 350.00 |
| 12 | Every km outside of Sid | km | 172.08 |
| 13 | Transportation of the deceased | km | 49.26 |
| 14 | Lease of a grave site | body | 2,647.98 |
| 15 | Lease of a grave site while still alive | body | 16,957.90 |
| 16 | Lease of a place for a tomb with three deceased | lease | 7,944.34 |
| 17 | Maintaining hygiene for 10 years for one grave site | body | 6,797.26 |
| 18 | Maintaining hygiene for 10 years for the tomb | pcs | 10,195.88 |
| 19 | Tomb construction | pcs | 119,398.13 |
| 20 | The cost of erecting a monument | pcs | 882.64 |
| 21 | Costs to build a frame for one grave site | pcs | 662.00 |
| 22 | Costs to build a frame for two grave sites | pcs | 1,103.32 |
| 23 | Costs to build a frame for three grave sites | pcs | 1,323.99 |
| 24 | The cost of building a tomb for two places | pcs | 5,516.61 |
| 25 | The cost of building a tomb for four places | pcs | 6,840.60 |
| 26 | The cost of building a tomb for six places | pcs | 8,164.59 |
| 27 | Use of refrigerator | day | 2,536.77 |
| 28 | Preparing a used tomb | pcs | 14,697.08 |

**Price list for greenery in 2021**

| Number | Type of service | Unit | Price without VAT |
|---|---|---|---|
| 1 | Mowing with a back mower | $m^2$ | 8.28 |
| 2 | Mowing with a self-propelled mower | $m^2$ | 7.21 |
| 3 | Mowing with a tractor mower | $m^2$ | 5.88 |
| 4 | Drilling large holes with planting | pcs | 141.92 |
| 5 | Drilling small holes with planting | pcs | 94.62 |
| 6 | Drilling large holes | pcs | 283.87 |
| 7 | Drilling small holes | pcs | 186.69 |
| 8 | Planting trees | pcs | 135.04 |
| 9 | Planting roses and the like | pcs | 82.89 |
| 10 | Planting flowers | pcs | 38.93 |
| 11 | Planting grass with raking | $m^2$ | 13.68 |
| 12 | Watering seedlings | pcs | 22.63 |
| 13 | Watering flowers | $m^2$ | 13.52 |
| 14 | Watering lawns | $m^2$ | 13.64 |
| 15 | Digging seedlings on a hard surface | pcs | 88.77 |
| 16 | Digging seedlings on a soft surface | pcs | 65.38 |
| 17 | Mowing weeds over 3cm | $m^2$ | 32.09 |
| 18 | Mowing weeds up to 3cm | $m^2$ | 21.82 |
| 19 | Mowing roses and flowers | $m^2$ | 21.82 |
| 20 | Pruning trees with collecting branches | pcs | 2,434.67 |
| 21 | Pruning shrubs and roses | pcs | 82.86 |

| | | | |
|---|---|---|---|
| 22 | Pruning hedges | m | 123.90 |
| 23 | Manual deep digging | $m^2$ | 119.85 |
| 24 | Manual medium digging | $m^2$ | 85.59 |
| 25 | Manual shallow digging | $m^2$ | 52.75 |
| 26 | Milling the plowed surface | $m^2$ | 11.99 |
| 27 | Raking a fallen leaf | $m^2$ | 6.85 |
| 28 | Jardiniere maintenance | pcs | 171.22 |

**Price list for parking services in 2021**

| Number | Type of service | Unit | Price without VAT |
|---|---|---|---|
| 1 | Parking I zone | hour | 40.41 |
| 2 | Parking II zone | hour | 30.32 |
| 3 | Parking ticket for one day of parking | day | 182.00 |
| 4 | Occasional parking lots-fair, etc. | day | 102.78 |
| 5 | Daily parking ticket | day | 1,027.76 |
| 6 | Privileged user-tenant | | 112.79 |
| 7 | Privileged user-tenant | | 5,549.88 |
| 8 | Legal entities - monthly | month | 2,163.42 |
| 9 | Legal entities-annually | year | 25,961.08 |
| 10 | Subscription for individuals - monthly | month | 1,027.76 |
| 11 | Subscription for legal entities - monthly | month | 3,597.14 |
| 12 | Subscription for individuals - semi-annual | 6 months | 6,166.53 |
| 13 | Subscription for legal entities - semi-annual | 6 months | 21,582.84 |
| 14 | Subscription for individuals - annual | year | 12,332.99 |
| 15 | Subscription for legal entities - annual | year | 43,165.70 |
| 16 | Reservation per month | month | 5,138.77 |
| 17 | Semi-annual reservation | 6 months | 30,832.64 |
| 18 | Reservation per year | year | 61,665.28 |
| 19 | Additional ticket | | 1,027.76 |
| 20 | Placing and removing handcuffs | | 770.83 |
| 21 | Attempt to lift | | 3,031.88 |
| 22 | Storage costs | day | 545.74 |
| 23 | Removal of vehicles up to 800 kg | | 5,138.77 |
| 24 | Removal of vehicles up to 800 kg | | 6,166.53 |
| 25 | Removal of vehicles from 801-1330 kg | | 6,166.53 |
| 26 | Removal of vehicles from 801-1330 kg | | 9,249.79 |
| 27 | Removal of vehicles from 1330-1900 kg | | 9,249.79 |
| 28 | Removal of vehicles from 1330-1900 kg | | 13,874.62 |
| 29 | Removal of vehicles from 1901 and heavier, freight up to 4 tons, buses up to 15 passengers | | 13,874.62 |
| 30 | Removal of vehicles from 1901 and heavier, freight up to 4 tons, buses up to 15 passengers | | 20,812.04 |

**Price list of fair taxes in 2021**

| Number | Type of service | Unit | Price without VAT |
|---|---|---|---|
| 1 | Craft products | tax | 1,502.78 |
| 2 | Agricultural products | tax | 1,502.78 |
| 3 | Craft-technical products-spare parts | tax | 1,502.78 |
| 4 | Lime, firewood, timber-truck up to 3 tons | pcs | 500.37 |
| 5 | Truck over 3 tons | pcs | 835.36 |
| 6 | Big cattle (piece) | pcs | 273.48 |
| 7 | Medium cattle (goats, sheep) | pcs | 100.18 |

| | | | |
|---|---|---|---|
| 8 | Small cattle (piglets) | pcs | 50.06 |
| 9 | Agricultural and other machinery | pcs | 166.94 |
| 10 | Tractors with trailer | pcs | 233.78 |
| 11 | Attached machines | pcs | 100.18 |
| 12 | Truck without trailer | pcs | 250.44 |
| 13 | Truck with a trailer | pcs | 294.49 |
| 14 | Private catering facilities (1m) | m | 116.88 |
| 15 | Parking-passenger vehicles | day | 83.48 |
| 16 | Parking-load vehicles | day | 250.44 |
| 17 | Unnumbered places | pcs | 834.55 |

**Waste collection price list in 2021**

| Number | Type of service | Unit | Price without VAT |
|---|---|---|---|
| 1 | Single-member households | Household | 344.84 |
| 2 | Household with two members | Household | 448.27 |
| 3 | Household with three members | Household | 551.70 |
| 4 | Household with four members | Household | 655.14 |
| 5 | Household with five members | Household | 758.60 |
| 6 | A household with six or more members | Household | 861.14 |
| 7 | Legal entities: sales area | Household | 29.11 |
| 8 | Sales space up to 25 $m^2$ | $m^2$ | 727.13 |
| 9 | Business space | $m^2$ | 19.41 |
| 10 | Business space up to 25 $m^2$ | $m^2$ | 485.37 |
| 11 | Open surfaces | $m^2$ | 23.32 |
| 12 | Catering facilities | $m^2$ | 38.83 |
| 13 | Catering facilities 25 $m^2$ | $m^2$ | 970.56 |
| 14 | Eligible users | | 5.93 |
| 15 | Container maintenance monthly | pcs | 74.72 |
| 16 | Bulky cargo transport by tractor | tour | 3,081.54 |
| 17 | Heavy-load transport by tractor | tour | 4,108.74 |

**Price list for waste disposal services in 2021**

| Number | Type of service | Unit | Price without VAT |
|---|---|---|---|
| 1 | Garbage disposal by trailer | | 662.21 |
| 2 | Garbage disposal by tractor | | 2,282.64 |
| 3 | Garbage disposal by truck | | 3,260.90 |
| 4 | Delivery by our transport 1m | | 859.82 |
| 5 | Delivery by our transport 1m from the periphery | | 1,630.45 |
| 6 | The price of km traveled during garbage collection | km | 163.07 |
| 7 | Septic tank pumping | pcs | 2,251.61 |
| 8 | Interpol septic tank pumping | pcs | 1,690.83 |

**The price of working machines with the workers engagement in 2021**

| Number | Type of service | Unit | Price without VAT |
|---|---|---|---|
| 1 | Self-propelled mower | hour | 155.42 |
| 2 | Motor mower | hour | 155.42 |

| | | | |
|---|---|---|---|
| 3 | Small tractor mower | hour | 2,096.52 |
| 4 | Tractor mower | hour | 2,664.34 |
| 5 | Chainsaw | hour | 1,990.50 |
| 6 | Drills | hour | 2,234.55 |
| 7 | Forklift | hour | 4,527.54 |
| 8 | Dozer | hour | 8,218.56 |
| 9 | Use of shower | | 457.36 |
| 10 | Use of toilet | | 67.46 |

**Price list for zoo hygiene in 2021**

| Number | Type of service | Unit | Price without VAT |
|---|---|---|---|
| 1 | Capturing pets from public areas | pcs | 626.26 |
| 2 | Removal of animals in public and green areas without owners | m | 3,408.68 |
| 3 | Euthanasia of dogs taken from the owner | m | By bill |
| 4 | Vaccine, microchip application, deworming | m | By bill |
| 5 | Sterilization | m | By bill |
| 6 | Burial of stray dogs | m | 1,514.97 |
| 7 | Removal of dead animals from public and green areas | m | 1,641.21 |
| 8 | Living room in the shelter | day | 721.35 |
| 9 | Shelter disinfection | $m^2$ | By bill |
| 10 | Catching a dog on call of legal entities | pcs | 6,817.36 |
| 11 | Return of the dog at the request of the owner | pcs | 2,164.24 |
| 12 | Guarding, feeding, washing, cleaning and providing shelter per day | day | 7,056.00 |
| 13 | Excavation of a pit for burying dogs | pcs | By bill |
| 14 | Team work on catching and caring for dogs daily | day | 10,916.85 |
| 15 | Out of working hours | | 50% more |
| 16 | On Sundays and holidays | | 100% more |
| 17 | Food for dogs | | By bill |

**Price list of market taxes for 2021**

| Number | Type of service | Unit | Price without VAT |
|---|---|---|---|
| 1 | Commodity stalls market day | pcs | 102.66 |
| 2 | Commodity stalls off-market day | pcs | 77.00 |
| 3 | Agricultural stalls market day with lease | pcs | 86.35 |
| 4 | Agricultural stalls market day without lease | pcs | 183.34 |
| 5 | Agricultural stalls off-market day with lease | pcs | 64.16 |
| 6 | Agricultural stalls off-market day without lease | pcs | 137.50 |
| 7 | Free space 1m with lease | m | 32.64 |
| 8 | Free space 1m without lease | m | 73.34 |