

Report on the study of the morphological composition of municipal waste in the Kherson municipality

Summer season (April 2025)

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Introduction

The scientific and technical report on the study of the composition of municipal waste (hereinafter referred to as MSW) of the Kherson municipality was prepared in accordance with the Methodological Recommendations for Determining the Morphological Composition of Municipal Waste [1].

Kherson municipality is a municipality in Ukraine, in the Kherson region with the administrative centre in the city of Kherson. The territory covers 452.769 km². The municipality consists of 16 administrative units: the city of Kherson, urban-type settlements Antonivka, Zelenivka, Komyschany, Naddnipryanske, villages of Bohdanivka, Petrivka, Sadove, Stepanivka and villages of Blahovishchenske, Zymivnyk, Inzhenerne, Molodizhne, Prydniprovske, Pryozerne, and Solnechne. The municipality has been severely affected and suffers from daily shelling by the Russian Federation. Most of the municipality is located in the Dnipro River delta and therefore was severely affected by the explosion of the Kakhovka hydroelectric power plant in June 2023.

The population of the municipality has decreased from 317.8 thousand people (January 2022, of which 279.1 thousand people lived in Kherson) to 90.9 thousand people (May 2024, of which 70.9 thousand people lived in Kherson). The population is unstable and highly dependent on the security situation. Statistics are not updated due to martial law.

The Kherson City Military Administration provided a table with information on the number of residents by administrative units (Annex 1), but there is no data on the ratio of residents in multi-apartment and single-family housing, so we did not use the appropriate weighting factors to adjust the results. Therefore, the composition of municipal waste for Kherson municipality was calculated as an arithmetic mean.

When conducting the study of the composition of municipal waste and preparing this report, the requirements of the Terms of Reference for the development of a report on the determination of the morphological composition of municipal waste in the territory of the Kherson municipality were taken into account in accordance with the Agreement No. 07/30/08/2024 between the NGO "Zero Waste Alliance Ukraine", EDRPOU code 42830021, represented by Sidorenko Sofia-Yulia Anatoliievna, acting on the basis of the Charter - the "Customer", and the individual entrepreneur Kovalenko Victoria Viktorovna, EDRPOU code 3283600308 - the "Contractor".

The purpose of this study is to obtain baseline data on the morphological composition of municipal waste to improve the efficiency of its management in the Kherson municipality.

1. Description of the research methodology

In accordance with the Methodological Recommendations for Determining the Morphological Composition of municipal Waste [1], a special commission was created with representatives of the relevant structural units of local governments and/or their executive bodies, waste management service providers, business entities operating in the field of municipal waste management in the territory of the Kherson municipality to organize the study to determine the morphological composition of municipal waste.

The morphological composition of municipal waste was determined by three sources of its generation:

- 1) households - apartment buildings;
- 2) households - single-family residential buildings;
- 3) Other sources of municipal waste generation (enterprises, institutions and organizations).

According to the Terms of Reference, the morphological composition of municipal waste is planned to be determined during 4 seasons of 2024 -2025.

The morphological composition of municipal waste is determined by classification (Annex 3).

The morphological composition of municipal waste was determined by:

- 1) removal of municipal waste from containers from specially selected routes (Annex 4);
- 2) collection and transportation of municipal waste by special-purpose vehicles for the collection and transportation of the respective type of municipal waste (hereinafter referred to as garbage trucks) without their forced compaction;
- 3) employees (hereinafter referred to as sorters) trained and instructed (Annex 5) were involved in the study to determine the morphological composition of municipal waste;
- 4) the morphological composition of municipal waste was determined in accordance with Section II of the Methodological Recommendations for Determining the Morphological Composition of Municipal Waste [1], collected and transported by garbage trucks.

Since waste in the Kherson municipality is currently collected according to a certain schedule, the study was conducted:

- 1) on Route 1 "Multi-apartment residential buildings" - 7250 kg of municipal waste was collected for the period 21.07.2025-22.07.2025 (2 days). The analysis was carried out on 23.07.2025;
- 2) on Route 2 "Single-family residential buildings" - 4940 kg of municipal waste was collected for the period 21.07.2025-23.07.2025 (3 days). The analysis was carried out on 24.07.2025;
- 3) on Route 3 "Other sources of municipal waste generation: enterprises, institutions and organizations" - 1830 kg of municipal waste for the period 15.07.2025-21.07.2025(7 days). The analysis was carried out on 22.07.2025.

The study was conducted by 3 sorters with whom the CPA contracts were signed.

The study was conducted in the following order:

1) Prior to the study, a briefing on occupational safety and health and work under martial law was conducted for municipal waste sorters (Annex 5) directly on the territory of the municipal waste treatment facility - 120 Raketna St., Kherson, municipal landfill (landfill);

2) Before the study, each sorter was given plastic bags for separate collection of certain or several types (their components) of municipal waste;

3) A separate site was allocated for research on the territory of the municipal waste treatment facility;

4) the garbage truck with municipal waste was checked for radioactive contamination and weighed on truck scales installed at the municipal waste treatment facility with a discreteness of up to 10 kg and a weighing error of no more than $0.5 \pm 1\%$, and the weight was entered into Excel tables.

5) the garbage truck was unloaded at a designated site and the total amount of unloaded municipal waste was selected with shovels:

- 30 samples weighing 10 kg each for municipal waste from households - "multi-apartment residential buildings". The analysis was carried out on January 22, 2025.
- 30 samples weighing 10 kg each for municipal waste from households - "single-family residential buildings". The analysis was carried out on January 23, 2025.
- 15 samples weighing 10 kg each for municipal waste from other sources of municipal waste generation. The analysis was carried out on January 21, 2025.

Each sample was transferred to a sorting table for further separation into separate types (their components) of municipal waste, and the remaining municipal waste from the sample was removed from the site;

6) Each municipal waste sorter collected several types of municipal waste in containers of different sizes (plastic containers, bags, sacks or beggars). The containers were filled manually. After the selection of certain types (or components thereof) of municipal waste was completed, the residues that could not be sorted were loaded into bags.

7) The volume of containers with the selected types of municipal waste, as well as the remaining waste, was weighed and measured in turn. The results of each measurement were entered into Excel spreadsheets. The selection of individual components of municipal waste and their measurement was accompanied by photographic documentation and attached to the report.

The morphological composition of municipal waste should be determined by weighing dry waste. However, in Ukraine, there is currently virtually no access to large dewatering facilities. Therefore, untreated wet waste was used for the analysis.

Errors that need to be taken into account during the study

The morphological composition of waste on Monday will differ from the composition of waste on other days of the week (weekend effect).

The morphological composition of waste will be different during school holidays and the morning after holidays. Accordingly, samples are not collected during school holidays (during the school year) or weeks with holidays.

But this is irrelevant to the current situation in Kherson.

1.1. Selection of routes for municipal waste collection

The routes were selected to cover: multi-apartment residential buildings - Route 1, single-family residential buildings - Route 2, and other sources of municipal waste generation (enterprises, institutions and organizations) - Route 3 (Annex 4).

1.2. Territory and premises for research

To conduct the study, a specially equipped room was provided to ensure safe working conditions during the work and to comply with labour protection regulations. The premises at 120 Raketna St., Kherson, a municipal solid waste landfill, are equipped with electricity for lighting, water for washing hands and containers, and heating.

It is very important to have good lighting conditions during sorting. The illumination on the table should be ≥ 300 lux (1 lux is 1 lm/m²). This means that if the sorting takes place with inadequate basic lighting, then additional lighting must be provided: in our case, two LED lamps of 50 W each, 4000 lm each.

Since the weather was warm and rainless, part of the study was conducted outside on a durable film.

Military risks were taken into account:

- in case of shelling, the nearest shelter is located on the territory of the training ground;
- in case of a power outage, reports were printed out (Annex 3);
- The scales were charged, and a connection to a generator was provided.

1.3. Equipment and inventory

The equipment and supplies used for transportation, sorting, research and processing of the results are presented in Annex 6. All equipment and supplies were purchased prior to the start of the first phase and will be purchased as needed before each phase. Any equipment that can be reused will be reused to reduce waste generation and to comply with the principle of resource efficiency.

1.4. Training program for sorters

Prior to the study, a safety briefing was conducted for municipal waste sorters (Annex 5) directly on the territory of the municipal waste treatment facility - 120 Raketna St., Kherson, municipal solid waste landfill (landfill).

The training was also provided on how to identify the type of waste according to the sorting catalogue by type of municipal waste (Annex 7).

1.5. Sampling of municipal waste

In accordance with Section II of the Methodological Recommendations for Determining the Morphological Composition of Municipal Waste [1], the methodology for preparing a sample of mixed municipal waste for sampling for research:

- for multi-apartment residential buildings: for 3 days, it is recommended to collect 1000 kg (5-7 m³) daily from the garbage truck of the selected municipal waste collection route - or up to 6 containers of 1.1 m³, filled by at least 75%. Since in July 2025, waste

collection on the selected route was carried out once every two days, we collected a total of 7250 kg of household waste (3625 kg/day), which meets the requirements of the Methodological Recommendations for Determining the Morphological Composition of Household Waste. There was also a significant increase in the amount of waste collected on this route, which, in our opinion, is due to seasonal fluctuations in waste generation, as well as the fact that the amount of municipal waste generated currently depends heavily on the security situation. For comparison, in the autumn season, waste on this route was collected once every 4 days, 4240 kg in total, 1060 kg/day, in winter - once every 4 days, 2070 kg in total, 517.5 kg/day, in spring - once every 3 days, 6830 kg, 2276.67 kg/day.

- for single-family residential buildings (detached houses): within 3 days, it is recommended to collect 1,000 kg (5–7 cubic meters) or up to 6 containers with a volume of 1.1 cubic meters, filled to at least 75% capacity, from the garbage truck on the selected household waste collection route every day. Since in July 2025, the frequency of waste collection on the selected route is once every 3 days, we collected a total of 4,940 kg of household waste (1,647 kg/day), which meets the requirements of the Methodological Recommendations for Determining the Morphological Composition of Household Waste. There was also a decrease in the amount of household waste collected on this route. For comparison, in the autumn season, waste on this route was collected once every 4 days, 8610 kg in total, 2152.5 kg/day, in winter - once every 7 days, 6,170 kg in total, 881.43 kg/day, in the spring season - once every 3 days, 8,910 kg in total, 2,970 kg/day.

- for other sources of household waste: within 3 days, it is recommended to collect 500 kg (2.5–3.5 cubic meters) or up to 3 containers with a volume of 1.1 cubic meters, filled to at least 75% capacity, from the garbage truck on the selected household waste collection route. Since the frequency of waste collection on the selected route in April 2025 is once every 7 days, we collected a total of 1,830 kg of household waste (610 kg/day), which meets the requirements. There was an increase in the amount of waste collected on this route. For comparison, in the autumn season, waste on this route was collected once every 7 days, 4,400 kg in total, 628.57 kg/day, in winter - once every 7 days, a total of 2,060 kg, 294.29 kg/day, in the spring season - once every 7 days, a total of 1,950 kg, 278.57 kg/day.

The sampling methodology for the study of the morphological composition of mixed municipal waste included:

- for multi-apartment residential buildings: from the corresponding sample of mixed municipal waste obtained, select 30 samples weighing at least 10 kg each with shovels. A total of 300 kg of municipal waste;
- for single-family residential buildings (manor-type houses): from the corresponding sample of mixed municipal waste obtained, select 30 samples weighing at least 10 kg each with shovels. The total sample is 300 kg of municipal waste;
- for other sources of municipal waste generation: from the corresponding sample of mixed municipal waste obtained, select 15 samples weighing at least 10 kg each with shovels. A total of 150 kg of municipal waste.

The team analyzed the samples using the following algorithm:

- The samples were transferred to an open area, a strong film was spread, and the samples were turned over onto it;
- containers of different volumes, with appropriate labelling of the contents, placed around the film;
- checked the cleanliness of the sorting table;
- spread the film on the table;

- checked the scales and their measurements;
- prepared a reporting statement.

Electronic scales are installed and customized. We used scales with the following characteristics:

- Maximum weight: 1000 kg;
- Minimum weight: 10 kg;
- Two clean containers of 20 and 5 litres were additionally used for packaging.

The waste was sorted and large items (larger than Ø 100 mm) were placed in the appropriate container (as is done on the sorting line). Smaller items were then sorted, especially hazardous waste.

Note: after the sorter identified the garbage as medicine, it did not open the package, even if it was transparent.

When the container was filled, it was weighed and the contents were poured into a garbage bag for later disposal. The appropriate container was placed on the scales, the containers were then weighed, and the weighing results were entered into a report card.

The volumes of each type of waste were also measured and recorded in a report.

In the end, all the containers were emptied, the table was wiped down, and the room was cleaned.

The data from the reporting sheets was transferred to Excel spreadsheets.

We handed over photos and reports.

A photo report on the results of the morphological composition of municipal waste in Kherson municipality is presented in Annex 8.

2. Results of the study

The amount of municipal waste was analyzed by the main parameters: weight (kg), volume (m³), and average density (kg/m³).

The results of the study were analyzed in the following order:

- Determining the weight of municipal waste for each garbage truck as the difference between the weight of the garbage truck filled with municipal waste and the weight of the empty garbage truck;
- the weight of each sorted type (its component in the composition) of municipal waste is determined by summing up the relevant weighing data;
- the total weight of the sorted sample was determined by summing up all the data obtained during the weighing of the types (their components) of municipal waste and their residue;
- the mass of municipal waste that has been sorted is taken as 100% (by weight), the content (in %) of each type (its component in the composition) of municipal waste in a given sample is calculated;
- The volume of each sorted type (its component in the composition) of municipal waste was determined by using containers of different sizes and scientific methods;
- the total volume of the sorted sample was determined by summing up all the data obtained during the measurement of the volume of types (their components in the composition) of municipal waste and their residue;
- the volume of municipal waste that has been sorted is taken as 100% (by volume), and the content (in %) of each type (its component in the composition) of municipal waste in this sample is calculated;
- The average density of municipal waste in garbage trucks by type of municipal and other sources of municipal waste generation was determined;
- summarized the results by type of municipal and other sources of municipal waste generation;
- The average morphological composition of municipal waste by weight and volume received by municipal waste management facilities in garbage trucks was determined.

Based on the results of the conducted research, we calculated the arithmetic mean indicators of the morphological composition of mixed municipal waste generated in the Kherson municipality.

Let's look at the results in more detail.

2.1. Research results: apartment buildings

Route 1 "Multi-apartment residential buildings", 7250 kg were collected for the period 21.07.2025-22.07.2025 (2 days), sample 300 kg, sample volume 7,3 m³. The analysis was carried out on 23.07.2025. According to the calculations, the main fractions by weight are (Fig. 2.1, Table 2.1):

- recyclable materials account for 59.63%: glass - 21.2%, certain types of plastic 19.23% (plastic marked PET-1 - 9.47%, bottles marked HDPE-2 - 5.53%, plastic packaging marked LDPE-4 (film) - 4.23%), paper and cardboard - 12.13%, ferrous metal packaging (tin cans) - 4.47%, non-ferrous metal packaging (aluminum food and beverage cans) - 1.47%, Tetra Pak packaging - 1.13%.
- biowaste (26.87%), of which green waste (grass, leaves) - 22.27 %, food waste - 4.6 %.

- waste that cannot be or is very rarely subject to recovery (recycling) 11.83%: other composite packaging (doe-packs from ketchup, mayonnaise, snack packaging) - 1.97%, textiles 9.73%, waste electrical and electronic equipment (hereinafter referred to as WEEE) - 0.13%.

- hazardous waste 1.27%: in particular, medical waste, syringes - 0.2%, gas cylinders - 0.87%, other (oil filters) - 0.2%, Although hazardous waste usually accounts for up to 1% of the total weight of household waste, its separate collection is very important for protecting the environment and the health of community residents.

- residual waste that could not be separated 0.4%.

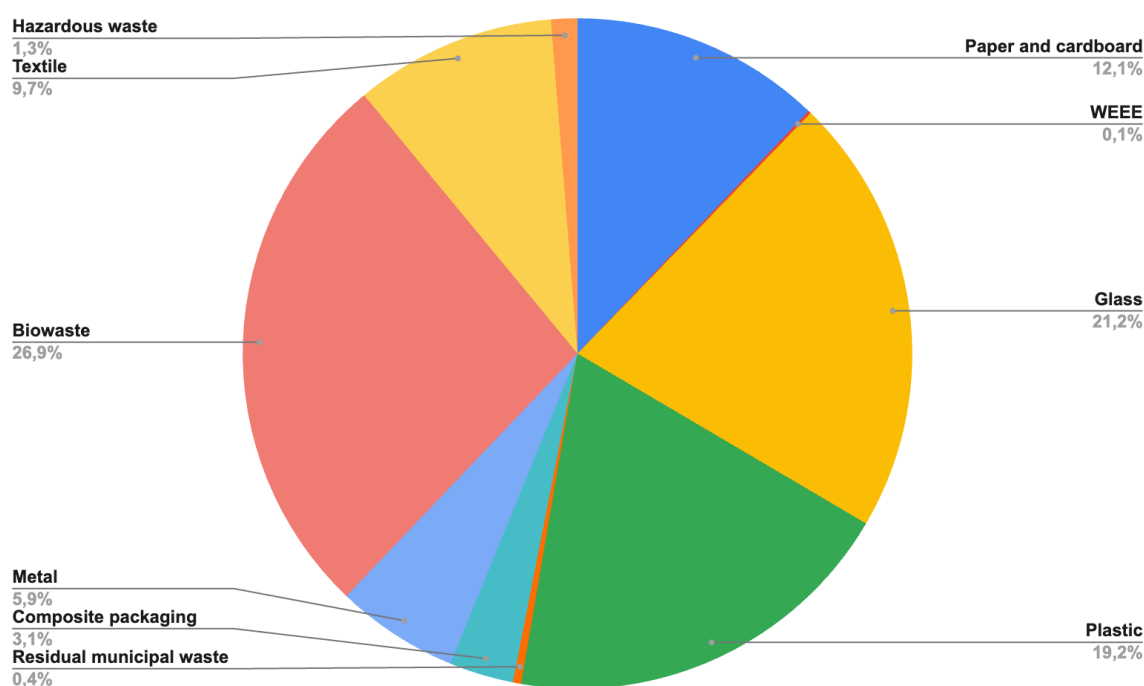


Fig. 2.1. Distribution of mixed municipal waste from multi-apartment residential buildings in Kherson municipality in % of the total weight of the sample, July 2025

According to the calculations, the main fractions by volume are (Fig. 2.2, Table 2.1):

- other recyclable materials account for 31.2%: paper and cardboard - 24.23%, glass - 2.05%, Tetra Pak packaging - 1.64%, ferrous metal packaging (tin cans) - 1.64%, non-ferrous metal packaging (aluminum food and beverage cans) - 1.64%. In this case, there is a significant amount of cardboard, which is not only recyclable but also occupies more than a quarter of the container.

- plastic accounts for 34.23%, of which 34.23% is recyclable (plastic marked PET-1 - 24.37%, bottles marked HDPE-2 - 4.93%, plastic packaging marked LDPE-4 (film) - 4.93%). In other words, packaging marked PET-1 takes up almost a quarter of the bin. If it is collected separately, the community can save significantly on the transportation of household waste. Furthermore, even with separate collections, residents need to develop a culture of crushing empty bottles so as not to transport air.

- biowaste 23.55%, of which green waste (grass) accounts for 22.73% and food waste accounts for 0.82%.

- other waste that is not or very rarely subject to recovery (recycling) 10.44%: other composite packaging (ketchup and mayonnaise pouches, snack packaging) - 6.57%, textiles 3.56%, electrical and electronic equipment waste - 0.31%.
- residual waste that could not be separated - 0.14%.
- hazardous waste - 0.41%.

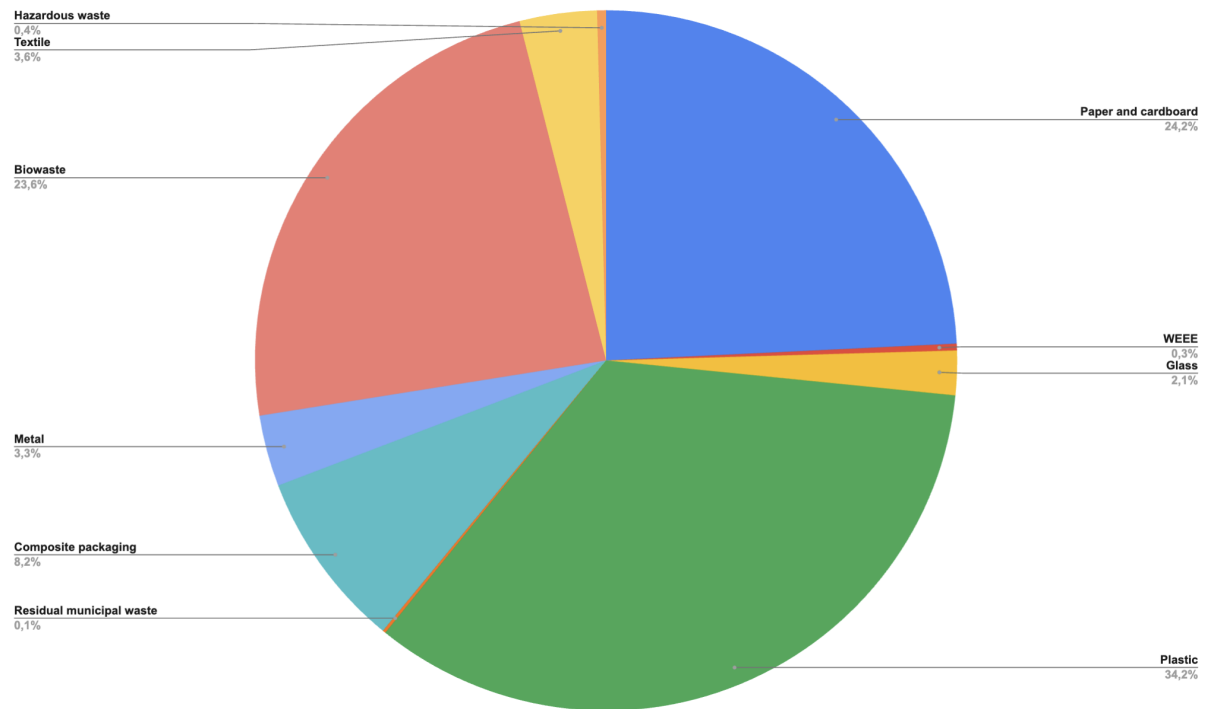


Fig. 2.2. Distribution of mixed municipal waste from multi-apartment residential buildings in Kherson municipality in % of the total sample volume, July 2025

Table 2.1. The results of the study of the morphological composition of the MW of multi-apartment residential buildings in the Kherson municipality, summer season, 2025

No.	Name of the MW faction	Weight, kg	Waste composition by weight, %	Sample volume, m ³	Composition of waste by volume, %	Density kg/m ³
1.	Paper and cardboard	36,40	12,13	1,77	24,24	20,56
1.1.	Paper packaging	0,00	0,00	0,00	0,00	0,00
1.2.	Flat cardboard packaging	29,80	9,93	1,66	22,73	17,95
1.3.	Cardboard (corrugated)	0,00	0,00	0,00	0,00	0,00
1.4.	Office paper	6,20	2,07	0,10	1,37	62,00
1.5.	Other paper	0,00	0,00	0,00	0,00	0,00
1.6.	Other cardboard	0,40	0,13	0,01	0,14	40,00
2.	Glass	63,60	21,20	0,15	2,05	424,00
2.1.	Transparent glass packaging	43,60	14,53	0,10	1,37	436,00
2.2.	Colored glass packaging	20,00	6,67	0,05	0,68	400,00
2.3.	Window glass	0,00	0,00	0,00	0,00	0,00
2.4.	Ceramics	0,00	0,00	0,00	0,00	0,00
2.5.	Other glass	0,00	0,00	0,00	0,00	0,00
3.	Plastic	57,70	19,23	2,50	34,23	23,08
3.1.	Bottles with PET-1 labeling	25,80	8,60	1,66	22,73	15,54
3.2.	Plastic packaging with PET-1 marking	2,60	0,87	0,12	1,64	0,00
3.3.	Bottles labeled with HDPE-2	16,60	5,53	0,36	4,93	46,11
3.4.	Plastic packaging with PVC-3 marking	0,00	0,00	0,00	0,00	0,00
3.5.	Plastic packaging labeled LDPE-4	12,70	4,23	0,36	4,93	35,28
3.6.	Plastic packaging with PP-5 marking	0,00	0,00	0,00	0,00	0,00
3.7.	Plastic packaging with PS-6 marking	0,00	0,00	0,00	0,00	0,00

No.	Name of the MW faction	Weight, kg	Waste composition by weight, %	Sample volume, m ³	Composition of waste by volume, %	Density kg/m ³
3.8.	Plastic with marking 7	0,00	0,00	0,00	0,00	0,00
3.9.	Other plastic packaging without labeling	0,00	0,00	0,00	0,00	0,00
3.10.	Other plastics	0,00	0,00	0,00	0,00	0,00
4.	Composite packaging	9,30	3,10	0,60	8,22	15,50
4.1.	Tetra pack type packaging	3,40	1,13	0,12	1,64	28,33
4.2.	Other composite packaging	5,90	1,97	0,48	6,57	12,29
5.	Metals	17,80	5,93	0,24	3,29	74,17
5.1.	Packaging (containers) made of ferrous metals	13,40	4,47	0,12	1,64	111,67
5.2.	Packaging (containers) made of aluminum	4,40	1,47	0,12	1,64	36,67
5.3.	Other ferrous metals	0,00	0,00	0,00	0,00	0,00
5.4.	Other metals (non-ferrous)	0,00	0,00	0,00	0,00	0,00
6.	Biowaste	80,60	26,87	1,72	23,55	46,86
6.1.	Food waste	13,80	4,60	0,06	0,82	230,00
6.2.	Waste from green spaces	66,80	22,27	1,66	22,73	40,24
6.3.	Other biodegradable waste	0,00	0,00	0,00	0,00	0,00
7.	Wood	0,00	0,00	0,00	0,00	0,00
8.	Textiles	29,20	9,73	0,26	3,56	112,31
8.1.	Clothing and footwear	8,40	2,80	0,13	1,78	64,62
8.2.	Other textile materials	20,80	6,93	0,13	1,78	160,00
9.	Waste electrical and electronic equipment	0,40	0,13	0,02	0,31	17,39
9.1.	Small municipal appliances and parts	0,40	0,13	0,02	0,31	17,39
9.2.	Computer equipment	0,00	0,00	0,00	0,00	0,00

No.	Name of the MW faction	Weight, kg	Waste composition by weight, %	Sample volume, m ³	Composition of waste by volume, %	Density kg/m ³
9.3.	Televisions and other devices containing a cathode ray tube	0,00	0,00	0,00	0,00	0,00
9.4.	Lamps with low energy consumption	0,00	0,00	0,00	0,00	0,00
10.	Waste batteries and accumulators	0,00	0,00	0,00	0,00	0,00
11.	Hazardous waste	3,80	1,27	0,03	0,41	126,46
11.1.	Fluorescent lamps	0,00	0,00	0,00	0,00	0,00
11.2.	Unused medicines and their packaging	0,60	0,20	0,01	0,14	60,00
11.3.	Syringes	0,00	0,00	0,00	0,00	0,00
11.4.	Mineral oils (technical)	0,00	0,00	0,00	0,00	0,00
11.5.	Gas canisters	2,60	0,87	0,01	0,14	260,00
11.6.	Paint	0,00	0,00	0,00	0,00	0,00
11.7.	Other hazardous waste	0,60	0,20	0,01	0,14	0,00
12.	Bulky municipal waste	0,00	0,00	0,00	0,00	0,00
13.	Municipal C&D waste	0,00	0,00	0,00	0,00	0,00
13.1.	Concrete	0,00	0,00	0,00	0,00	0,00
13.2.	Asphalt	0,00	0,00	0,00	0,00	0,00
13.3.	Lumber	0,00	0,00	0,00	0,00	0,00
13.4.	Drywall	0,00	0,00	0,00	0,00	0,00
13.5.	Mixed construction waste	0,00	0,00	0,00	0,00	0,00
14.	Residual municipal waste	1,2	0,40	0,01	0,14	120,00
15.	Total	300,00	100,00	7,30	100,00	41,08

2.2. Research results: single-family residential buildings

Route 2 "Single-family residential buildings", 4940 kg were collected for the period 21.07.2025-23.07.2025 (3 days), sample 300 kg, sample volume 7,08 m³. The analysis was carried out on 24.07.2025.

According to the calculations, the main fractions by weight are as follows (Fig. 2.3, Table 2.2):

- waste that cannot be or very rarely can be recovered (recycled) 36.87%: repair waste - 16.27%, plastic packaging marked PP-5 (yogurt cups, other dairy products) - 5.33%, other plastics - 4.33%, bulky waste - 5.07%, other composite packaging (do-packs from ketchup, mayonnaise) - 2.93%, textiles - 1.87%, waste electrical and electronic equipment - 1.07%.

- biowaste 31.9%, of which green waste (fallen leaves, branches) - 19.03% slightly exceeds food waste - 12.23%. Other biodegradable waste (toilet paper, faeces) - 0.63%

- Recyclable materials account for 21.37%: certain types of plastic - 7.76% (bottles marked PET-1 - 7.13%, plastic packaging marked LDPE-4 (film) - 0.63%), glass - 7.67%, paper and cardboard - 2.33%, packaging and other products made of non-ferrous metals (aluminum cans from food and beverages) - 1.47%, packaging made of ferrous metals (canned food cans) - 1.27%, Tetra Pak packaging (mainly disposable "paper" cups, which actually contain a layer of film) - 0.87%.

- Residual waste that could not be separated - 9.6%.

- Hazardous waste - 0.27%.

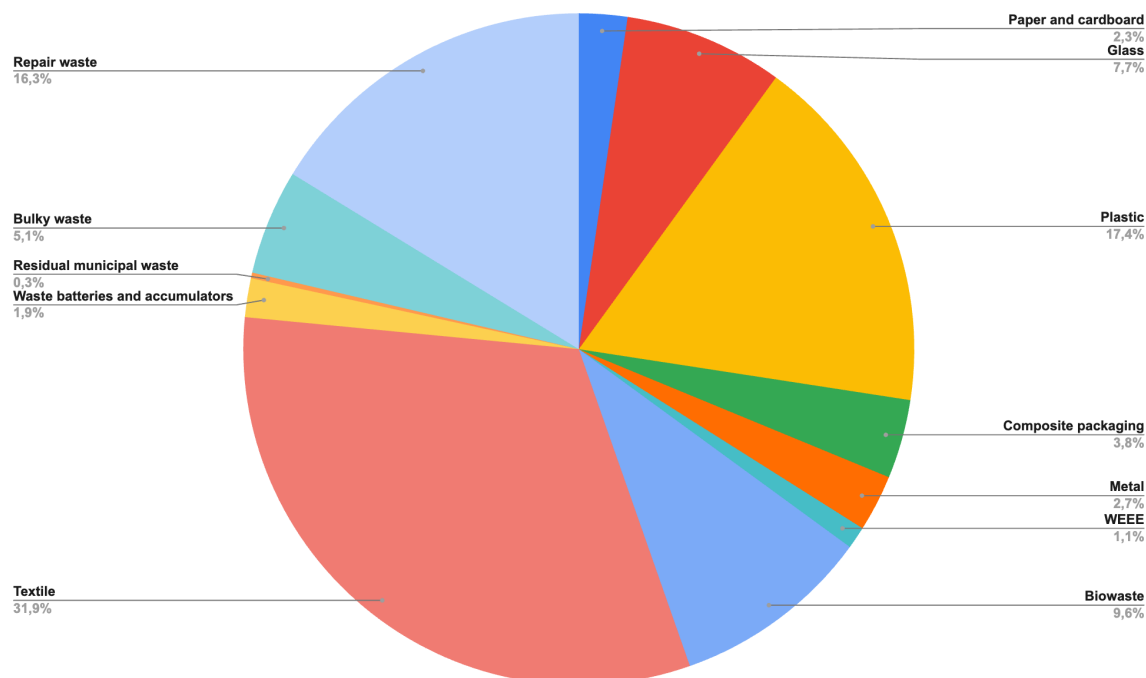


Fig. 2.3. Distribution of mixed municipal waste from single-family residential buildings in Kherson municipality in % of the total weight of the sample, July 2025

According to the calculations, the main fractions by volume are (Fig. 2.4, Table 2.2):

- plastic - 53.06%, of which 49.73% is subject to recovery (recycling) (bottles marked PET-1 - 46.9%, plastic packaging marked LDPE-4 (film) - 2.83%), plastic packaging marked PP-5 (yogurt cups, other dairy products) - 2.97%, other plastics - 0.37%.
- biowaste 25.2%, of which green waste (grass) - 23.45% significantly prevails over food waste - 0.99%, other biodegradable waste (toilet paper, faeces) - 0.76%.
- other waste that is not or very rarely subject to recovery (recycling) - 10.04%: bulky waste - 3.08%, other composite packaging (ketchup and mayonnaise cartons, snack packaging) - 2.54%, textiles - 2.54%, repair waste - 1.7%, WEEE - 0.18%.
- other recyclable materials account for 8.0%: paper and cardboard - 2.27%, packaging and other items made of non-ferrous metals (aluminum cans from food and beverages) - 2.19%, Tetra Pak packaging - 1.7%, ferrous metal packaging (canned food containers) - 1.13%, glass - 0.71%.
- residual waste that could not be separated - 3.53%.
- hazardous waste - 0.15%.

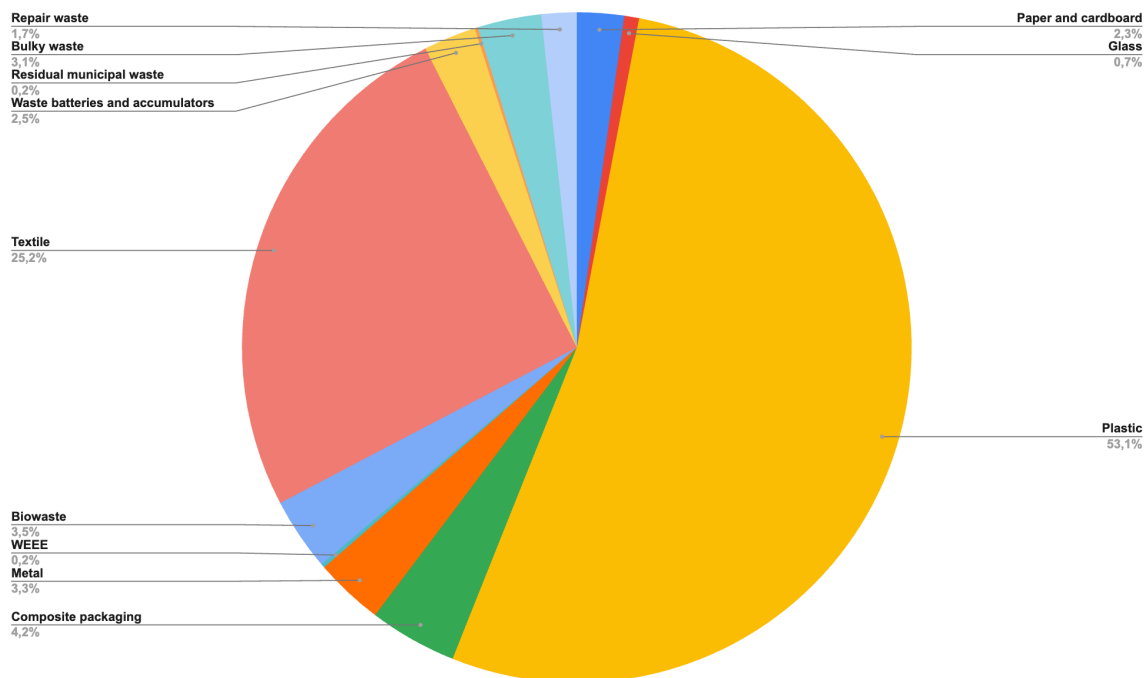


Fig. 2.4. Distribution of mixed municipal waste from single-family residential buildings in Kherson municipality in % of the total sample volume, July 2025

Table 2.2. The results of the study of the morphological composition of single-family residential buildings in Kherson municipality summer season, 2025

No.	Name of the MW faction	Weight, kg	Waste composition by weight, %	Sample volume, m ³	Composition of waste by volume, %	Density kg/m ³
1.	Paper and cardboard	7,00	2,33	0,16	2,27	43,48
1.1.	Paper packaging	0,00	0,00	0,00	0,00	0,00
1.2.	Flat cardboard packaging	2,00	0,67	0,12	1,70	16,67
1.3.	Cardboard (corrugated)	0,00	0,00	0,00	0,00	0,00
1.4.	Office paper	5,00	1,67	0,04	0,57	125,00
1.5.	Other paper	0,00	0,00	0,00	0,01	0,00
1.6.	Other cardboard	0,00	0,00	0,00	0,00	0,00
2.	Glass	23,00	7,67	0,05	0,71	460,00
2.1.	Transparent glass packaging	23,00	7,67	0,05	0,71	460,00
2.2.	Colored glass packaging	0,00	0,00	0,00	0,00	0,00
2.3.	Window glass	0,00	0,00	0,00	0,00	0,00
2.4.	Ceramics	0,00	0,00	0,00	0,00	0,00
2.5.	Other glass	0,00	0,00	0,00	0,00	0,00
3.	Plastic	52,30	17,43	3,76	53,06	13,92
3.1.	Bottles with PET-1 labeling	11,40	3,80	1,66	23,45	6,87
3.2.	Plastic packaging with PET-1 marking	10,00	3,33	1,66	23,45	6,02
3.3.	Bottles labeled with HDPE-2	0,00	0,00	0,00	0,00	0,00
3.4.	Plastic packaging with PVC-3 marking	0,00	0,00	0,00	0,00	0,00
3.5.	Plastic packaging labeled LDPE-4	1,90	0,63	0,20	2,83	9,50
3.6.	Plastic packaging with PP-5 marking	16,00	5,33	0,21	2,97	76,19
3.7.	Plastic packaging with PS-6 marking	0,00	0,00	0,00	0,00	0,00

No.	Name of the MW faction	Weight, kg	Waste composition by weight, %	Sample volume, m ³	Composition of waste by volume, %	Density kg/m ³
3.8.	Plastic with marking 7	0,00	0,00	0,00	0,00	0,00
3.9.	Other plastic packaging without labeling	0,00	0,00	0,00	0,00	0,00
3.10.	Other plastics	13,00	4,33	0,03	0,37	500,00
4.	Composite packaging	11,40	3,80	0,30	4,24	38,00
4.1.	Tetra pack type packaging	2,60	0,87	0,12	1,70	21,67
4.2.	Other composite packaging	8,80	2,93	0,18	2,54	48,89
5.	Metals	8,20	2,73	0,24	3,32	34,89
5.1.	Packaging (containers) made of ferrous metals	3,80	1,27	0,08	1,13	47,50
5.2.	Packaging (containers) made of aluminum	2,00	0,67	0,14	1,98	14,29
5.3.	Other ferrous metals	0,00	0,00	0,00	0,00	0,00
5.4.	Other metals (non-ferrous)	2,40	0,80	0,02	0,21	160,00
6.	Biowaste	95,70	31,90	1,78	25,20	53,64
6.1.	Food waste	36,70	12,23	0,07	0,99	524,29
6.2.	Waste from green spaces	57,10	19,03	1,66	23,45	34,40
6.3.	Other biodegradable waste	1,90	0,63	0,05	0,76	35,19
7.	Wood	0,00	0,00	0,00	0,00	0,00
8.	Textiles	5,60	1,87	0,18	2,54	31,11
8.1.	Clothing and footwear	0,80	0,27	0,15	2,12	5,33
8.2.	Other textile materials	4,80	1,60	0,03	0,42	160,00
9.	Waste electrical and electronic equipment	3,20	1,07	0,01	0,18	246,15
9.1.	Small municipal appliances and parts	2,00	0,67	0,01	0,14	200,00
9.2.	Computer equipment	0,00	0,00	0,00	0,00	0,00

No.	Name of the MW faction	Weight, kg	Waste composition by weight, %	Sample volume, m ³	Composition of waste by volume, %	Density kg/m ³
9.3.	Televisions and other devices containing a cathode ray tube	0,00	0,00	0,00	0,00	0,00
9.4.	Lamps with low energy consumption	1,20	0,40	0,00	0,04	400,00
10.	Waste batteries and accumulators	0,00	0,00	0,00	0,00	0,00
11.	Hazardous waste	0,80	0,27	0,01	0,15	77,13
11.1.	Fluorescent lamps	0,00	0,00	0,00	0,00	0,00
11.2.	Unused medicines and their packaging	0,00	0,00	0,00	0,00	#DIV/0!
11.3.	Syringes	0,00	0,00	0,00	0,00	0,00
11.4.	Mineral oils (technical)	0,00	0,00	0,00	0,00	0,00
11.5.	Gas canisters	0,80	0,27	0,01	0,14	80,00
11.6.	Paint	0,00	0,00	0,00	0,00	0,00
11.7.	Other hazardous waste	0,00	0,00	0,00	0,00	0,00
12.	Bulky municipal waste	15,20	5,07	0,22	3,08	69,72
13.	Municipal C&D waste	48,80	16,27	0,12	1,70	406,67
13.1.	Concrete	0,00	0,00	0,00	0,00	0,00
13.2.	Asphalt	0,00	0,00	0,00	0,00	0,00
13.3.	Lumber	48,80	16,27	0,12	1,70	406,67
13.4.	Drywall	0,00	0,00	0,00	0,00	0,00
13.5.	Mixed construction waste	0,00	0,00	0,00	0,00	0,00
14.	Residual municipal waste	28,80	9,60	0,25	3,53	115,20
15.	Total	300,00	100,00	7,08	99,99	42,38

2.3. Research results: other sources of municipal waste generation

Route 3 "Other sources of municipal waste generation: enterprises, institutions and organizations", 1830 kg were collected for the period 15.07.2025-21.07.2025 (7 days), so the sample is 150 kg, the sample volume is 5,57 m³. The analysis was carried out on 22.07.2025.

According to the calculations, the main fractions by weight are (Fig. 2.5, Table 2.3):

- recyclable materials account for 47.27%: glass - 15.20%, paper and cardboard - 8.47%, certain types of plastic - 13.47% (bottles labeled PET-1 - 6.67%, Tetra Pak packaging (mainly disposable "paper" cups, which actually contain a layer of film) - 5.33%, bottles marked HDPE-2 - 4.27%, plastic packaging marked LDPE-4 (film) - 2.53%), ferrous metal packaging - 2.4%, non-ferrous metal packaging (aluminum food and beverage cans) - 2.4%.
- waste that is not or very rarely subject to recovery (recycling) - 20.15%: textiles - 10.0%, other plastic packaging - 3.07%, waste electrical and electronic equipment - 2.67%, plastic packaging marked PP-5 (yogurt cups, other dairy products) - 2.27%, other composite packaging (do-packs from ketchup, mayonnaise, snacks) - 1.87%, repair packaging - 0.27%.
- biowaste - 14.53%, of which: food waste - 5.33%, green waste (grass, leaves) - 9.20%.
- residual waste that could not be separated - 13.8%.
- hazardous waste 4.27%.

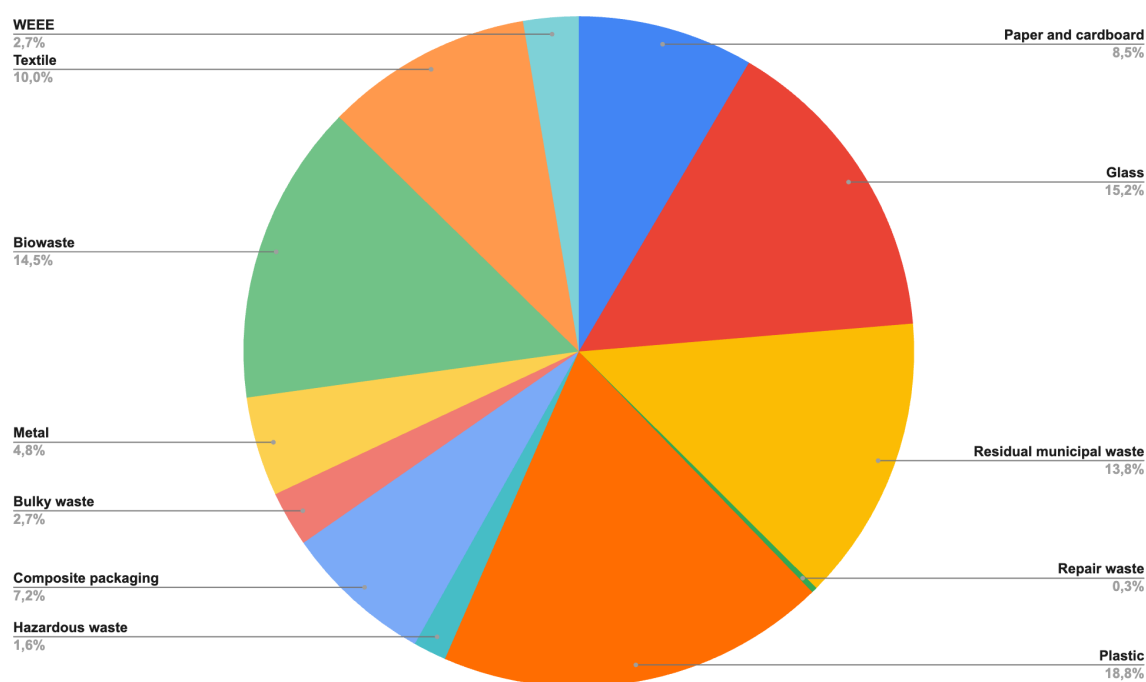


Fig. 2.5. Distribution of mixed municipal waste from the route "Other sources of municipal waste generation: enterprises, institutions and organizations" of Kherson municipality in % of the total weight of the sample, July 2025

According to the calculations, the main fractions by volume are (Fig. 2.6, Table 2.3):

- plastic - 41.68%, of which 37.36% is subject to recovery (recycling) (bottles marked PET-1 - 29.82%, bottles marked HDPE-2 - 4.31%, plastic packaging marked LDPE-4 (film) - 3.23%). In other words, PET-1 labeled bottles actually occupy more than 1/3 of the container.

If they are collected separately, the community can significantly save on the transportation of household waste. Furthermore, even with separate collection, residents need to develop a culture of compressing empty bottles so as not to transport air. Plastic waste that cannot be recycled (reprocessed) or can be recycled only very rarely - 4.32% - other plastic packaging and other plastics - 2.16%, plastic packaging marked PP-5 (yogurt cups, other dairy products) - 2.16%.

- other recyclable materials account for 40.16%: paper and cardboard - 30.09%, Tetra Pak packaging (mainly disposable “paper” cups, which actually contain a layer of film) - 5.39%, non-ferrous metal packaging (aluminum cans from food and beverages, snacks) - 2.16%, glass - 1.44%, ferrous metal packaging - 1.08%. In this case, there is a lot of cardboard, which is not only recyclable but also takes up more than 1/3 of the bin.

- other waste that is not or very rarely recyclable (reusable) - 10.78%: other composite packaging (doe-packs from ketchup, mayonnaise) - 6.11%, textiles - 3.59%, electrical and electronic equipment waste - 0.54%, repair waste - 0.54%.

- biowaste - 4.32%, of which green waste (grass, leaves) - 2.16%, food waste 2.16%.

- residual waste that could not be separated 2.69%.

- hazardous waste - 0.38%.

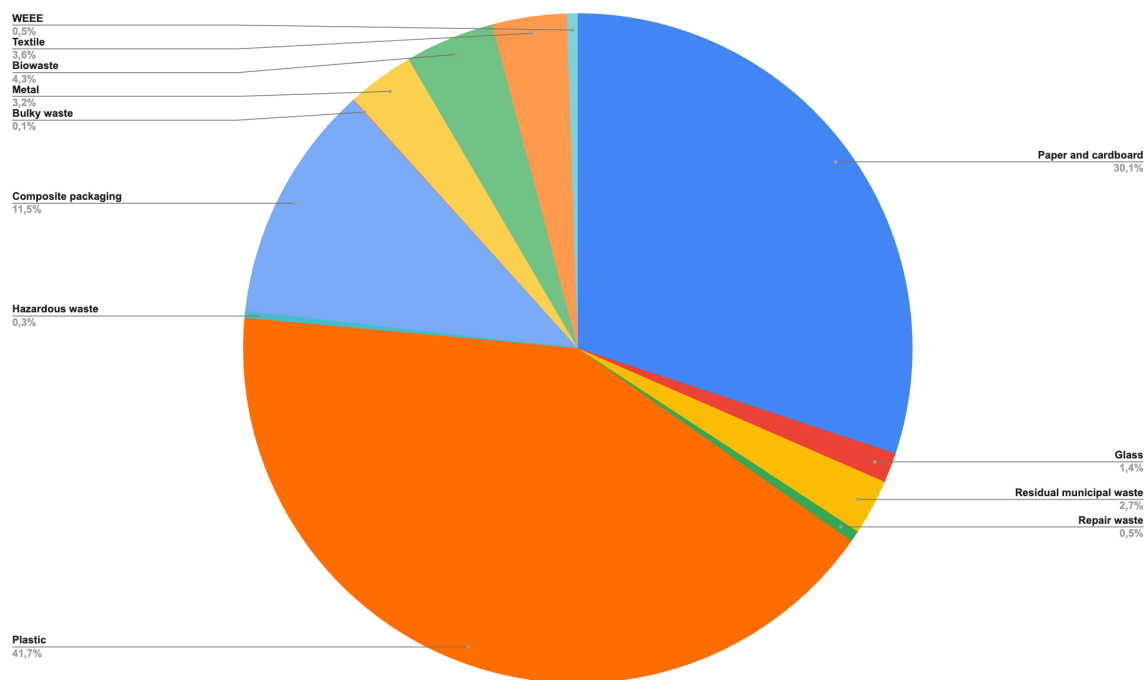


Fig. 2.6. Distribution of mixed municipal waste from the route "Other sources of municipal waste generation: enterprises, institutions and organizations" in Kherson municipality in % of the total sample volume, July 2025

Table 2.3. The results of the study of the morphological composition of the route "Other sources" of the Kherson municipality, summer season, 2025

No.	Name of the MW faction	Weight, kg	Waste composition by weight, %	Sample volume, m ³	Composition of waste by volume, %	Density kg/m ³
1.	Paper and cardboard	12,70	8,47	1,68	30,09	7,58
1.1.	Paper packaging	0,00	0,00	0,00	0,00	0,00
1.2.	Flat cardboard packaging	12,20	8,13	1,60	28,74	7,63
1.3.	Cardboard (corrugated)	0,00	0,00	0,00	0,00	0,00
1.4.	Office paper	0,10	0,07	0,07	1,26	1,43
1.5.	Other paper	0,00	0,00	0,00	0,00	0,00
1.6.	Other cardboard	0,40	0,27	0,01	0,09	80,00
2.	Glass	22,80	15,20	0,08	1,44	285,00
2.1.	Transparent glass packaging	4,00	2,67	0,03	0,54	133,33
2.2.	Colored glass packaging	18,80	12,53	0,05	0,90	376,00
2.3.	Window glass	0,00	0,00	0,00	0,00	0,00
2.4.	Ceramics	0,00	0,00	0,00	0,00	0,00
2.5.	Other glass	0,00	0,00	0,00	0,00	0,00
3.	Plastic	28,20	18,80	2,32	41,68	12,16
3.1.	Bottles with PET-1 labeling	10,00	6,67	1,66	29,82	6,02
3.2.	Plastic packaging with PET-1 marking	0,00	0,00	0,00	0,00	0,00
3.3.	Bottles labeled with HDPE-2	6,40	4,27	0,24	4,31	26,67
3.4.	Plastic packaging with PVC-3 marking	0,00	0,00	0,00	0,00	0,00
3.5.	Plastic packaging labeled LDPE-4	3,80	2,53	0,18	3,23	21,11
3.6.	Plastic packaging with PP-5 marking	3,40	2,27	0,12	2,16	28,33
3.7.	Plastic packaging with PS-6 marking	0,00	0,00	0,00	0,00	0,00
3.8.	Plastic with marking 7	0,00	0,00	0,00	0,00	0,00

No.	Name of the MW faction	Weight, kg	Waste composition by weight, %	Sample volume, m ³	Composition of waste by volume, %	Density kg/m ³
3.9.	Other plastic packaging without labeling	4,60	3,07	0,12	2,16	38,33
3.10.	Other plastics		0,00	0,00	0,00	0,00
4.	Composite packaging	10,80	7,20	0,64	11,50	16,88
4.1.	Tetra pack type packaging	8,00	5,33	0,30	5,39	26,67
4.2.	Other composite packaging	2,80	1,87	0,34	6,11	8,24
5.	Metals	7,20	4,80	0,18	3,23	40,00
5.1.	Packaging (containers) made of ferrous metals	3,60	2,40	0,06	1,08	60,00
5.2.	Packaging (containers) made of aluminum	3,60	2,40	0,12	2,16	30,00
5.3.	Other ferrous metals	0,00	0,00	0,00	0,00	0,00
5.4.	Other metals (non-ferrous)	0,00	0,00	0,00	0,00	0,00
6.	Biowaste	21,80	14,53	0,24	4,31	90,83
6.1.	Food waste	8,00	5,33	0,12	2,16	66,67
6.2.	Waste from green spaces	13,80	9,20	0,12	2,16	115,00
6.3.	Other biodegradable waste	0,00	0,00	0,00	0,00	0,00
7.	Wood	0,00	0,00	0,00	0,00	#DIV/0!
8.	Textiles	15,00	10,00	0,20	3,59	75,00
8.1.	Clothing and footwear	15,00	10,00	0,20	3,59	75,00
8.2.	Other textile materials	0,00	0,00	0,00	0,00	0,00
9.	Waste electrical and electronic equipment	4,00	2,67	0,03	0,54	132,45
9.1.	Small municipal appliances and parts	4,00	2,67	0,03	0,54	133,33
9.2.	Computer equipment	0,00	0,00	0,00	0,00	80,00
9.3.	Televisions and other devices containing a cathode ray tube	0,00	0,00	0,00	0,00	0,00

No.	Name of the MW faction	Weight, kg	Waste composition by weight, %	Sample volume, m ³	Composition of waste by volume, %	Density kg/m ³
9.4.	Lamps with low energy consumption	0,00	0,00	0,00	0,00	0,00
10.	Waste batteries and accumulators	4,00	2,67	0,00	0,05	1333,33
11.	Hazardous waste	2,40	1,60	0,02	0,33	129,56
11.1.	Fluorescent lamps	0,00	0,00	0,00	0,00	0,00
11.2.	Unused medicines and their packaging	0,60	0,40	0,02	0,27	40,00
11.3.	Syringes	0,00	0,00	0,00	0,00	0,00
11.4.	Mineral oils (technical)	0,00	0,00	0,00	0,00	0,00
11.5.	Gas canisters	1,80	1,20	0,00	0,05	600,00
11.6.	Paint	0,00	0,00	0,00	0,00	0,00
11.7.	Other hazardous waste	0,00	0,00	0,00	0,01	0,00
12.	Bulky municipal waste	0,00	0,00	0,00	0,00	0,00
13.	Municipal C&D waste	0,40	0,27	0,03	0,54	0,00
13.1.	Concrete	0,00	0,00	0,00	0,00	0,00
13.2.	Asphalt	0,00	0,00	0,00	0,00	0,00
13.3.	Lumber	0,00	0,00	0,00	0,00	0,00
13.4.	Drywall	0,00	0,00	0,00	0,00	0,00
13.5.	Mixed construction waste	0,40	0,27	0,03	0,54	0,74
14.	Residual municipal waste	20,70	13,80	0,15	2,69	138,00
15.	Total	150,00	100,00	5,57	100,00	26,95

2.4. Average indicators of municipal waste composition for the summer season

According to the calculations, the main fractions by weight are (Fig. 2.7, Table 2.4):

- recyclable materials account for 41.85%: glass - 14.59%, certain types of plastic - 13.49% (plastic marked PET-1 - 7.97%, bottles marked HDPE-2 - 3.07%, plastic packaging marked LDPE-4 (film) - 2.45%), paper and cardboard - 7.48%, ferrous metal packaging (tin cans) - 2.77%, Tetra Pak packaging (mainly disposable “paper” cups, which actually contain a layer of film) - 1.87%, non-ferrous metal packaging (aluminum cans from food and beverages) - 1.65%. In this case, there is a lot of glass, which can be recycled an infinite number of times.
- biowaste 26.41%, of which green waste (grass, leaves) - 18.36% prevails over food waste - 7.8%, other biodegradable waste (toilet paper, animal feces) - 0.25%.
- waste that cannot be recycled or is very rarely recyclable (recycling) - 23.5%: textiles - 6.64%, repair waste - 6.56%, plastic packaging marked PP-5 (yogurt cups, other dairy products) - 2.59%, other plastic packaging (in particular, vacuum packaging) and other unmarked plastic (in particular, children's toys) - 2.34%, other composite packaging (doe-packs from ketchup, mayonnaise, snacks, sweets) - 2.33%, bulky waste - 2.03%, waste electrical and electronic equipment - 1.01%.
- residual waste that could not be separated - 6.76%.
- hazardous waste - 1.46%. Although hazardous waste usually accounts for up to 1% of the total weight of household waste, this season it was 1.5 times higher, and its separate collection is very important for protecting the environment and the health of community residents.

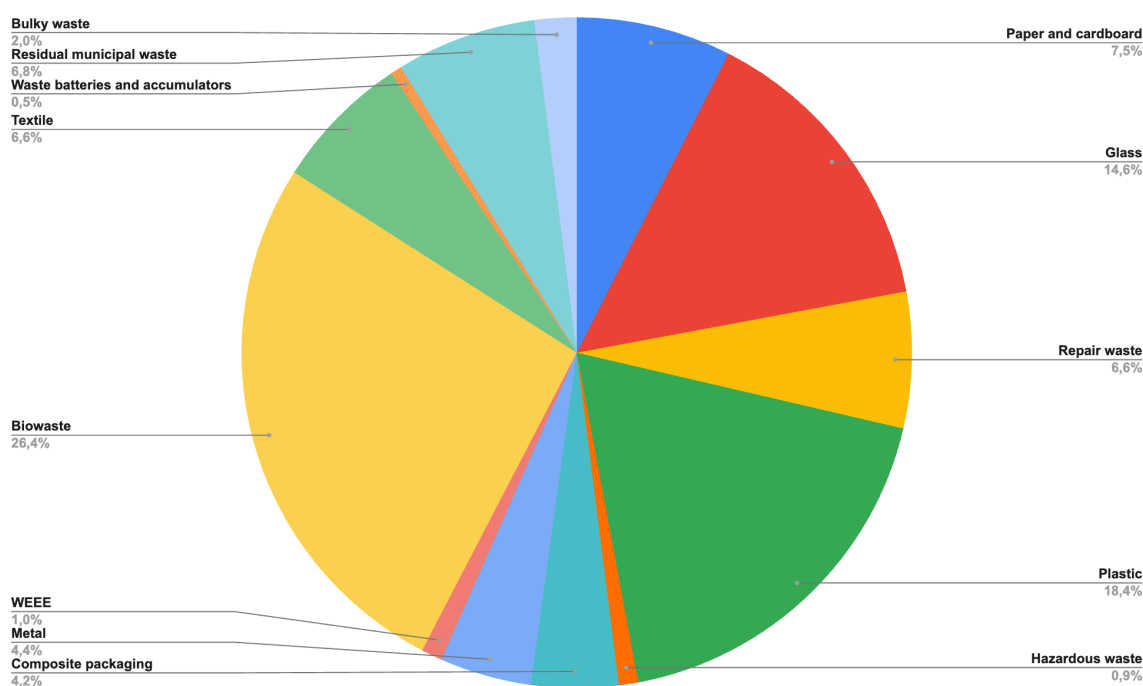


Fig. 2.7. Distribution of mixed municipal waste in Kherson municipality in % of the total weight of the sample, July 2025

According to the calculations, the main fractions by volume are (Fig. 2.8, Table 2.4):

- plastic 42.98%, of which 40.6% is recyclable (plastic marked PET-1 - 33.88%, bottles marked HDPE-2 - 3.01%, plastic packaging marked LDPE-4 (film) - 3.71%). Plastic waste that is not subject to or very rarely subject to recovery (recycling) - 2.38%: plastic packaging marked PP-5 (yogurt cups, other dairy products) - 1.65%, other plastic packaging and unmarked plastic (in particular, children's toys) - 0.73%.

- other recyclable materials account for 25.47%: paper and cardboard - 18.08%, Tetra Pak packaging (mainly disposable “paper” cups, which actually contain a layer of film) - 2.71%, non-ferrous metal packaging (aluminum food and beverage cans) - 1.98%, glass - 1.4%, ferrous metal packaging (canned food cans) - 1.3%.

- biowaste - 18.77%, of which green waste (grass, leaves) - 17.24%, food waste - 1.25%, other biodegradable waste (toilet paper, animal feces) - 0.27%.

- other waste that cannot be recycled or is very rarely recycled (reprocessed) - 10.39%: other composite packaging (doipacks from ketchup, mayonnaise, snacks, sweets) - 5.01%, textiles - 3.21%, bulky waste - 1.09%, repair waste - 0.75%, waste electrical and electronic equipment - 0.33%.

- residual waste that could not be separated - 2.06%.

- hazardous waste - 0.32%, including waste batteries and accumulators 0.02%.

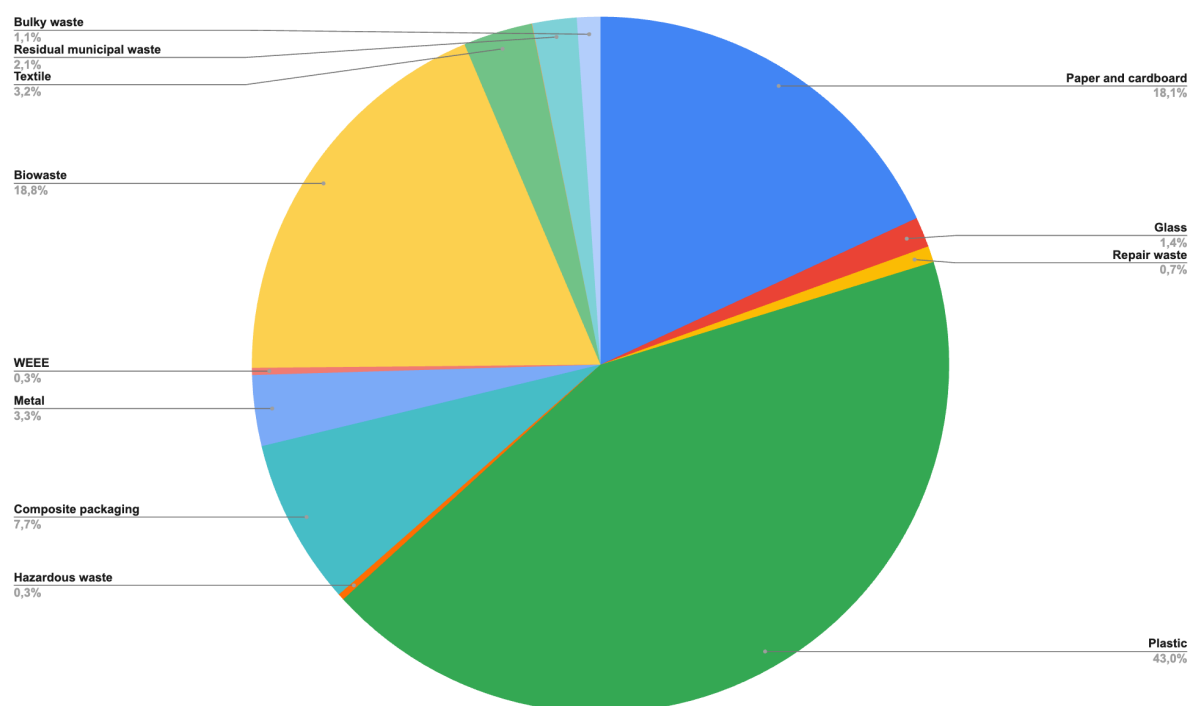


Fig. 2.8. Distribution of mixed municipal waste in Kherson municipality in % of the total sample volume, July 2025

Table 2.4. Results of the study of the morphological composition of the MW average indicators for the Kherson municipality, summer season, 2025

No.	Name of the MW faction	Weight, kg	Waste composition by weight, %	Sample volume, m ³	Composition of waste by volume, %	Density kg/m ³
1.	Paper and cardboard	56,10	7,48	3,61	18,08	15,56
1.1.	Paper packaging	0,00	0,00	0,00	0,00	0,00
1.2.	Flat cardboard packaging	44,00	5,87	3,38	16,94	13,02
1.3.	Cardboard (corrugated)	0,00	0,00	0,00	0,00	0,00
1.4.	Office paper	11,30	1,51	0,21	1,05	53,81
1.5.	Other paper	0,00	0,00	0,00	0,01	0,00
1.6.	Other cardboard	0,80	0,11	0,02	0,08	53,33
2.	Glass	109,40	14,59	0,28	1,40	390,71
2.1.	Transparent glass packaging	70,60	9,41	0,18	0,90	392,22
2.2.	Colored glass packaging	38,80	5,17	0,10	0,50	388,00
2.3.	Window glass	0,00	0,00	0,00	0,00	0,00
2.4.	Ceramics	0,00	0,00	0,00	0,00	0,00
2.5.	Other glass	0,00	0,00	0,00	0,00	0,00
3.	Plastic	138,20	18,43	8,58	42,99	16,11
3.1.	Bottles with PET-1 labeling	47,20	6,29	4,98	24,97	9,48
3.2.	Plastic packaging with PET-1 marking	12,60	1,68	1,78	8,92	7,08
3.3.	Bottles labeled with HDPE-2	23,00	3,07	0,60	3,01	38,33
3.4.	Plastic packaging with PVC-3 marking	0,00	0,00	0,00	0,00	0,00
3.5.	Plastic packaging labeled LDPE-4	18,40	2,45	0,74	3,71	24,86
3.6.	Plastic packaging with PP-5 marking	19,40	2,59	0,33	1,65	58,79
3.7.	Plastic packaging with PS-6 marking	0,00	0,00	0,00	0,00	0,00

No.	Name of the MW faction	Weight, kg	Waste composition by weight, %	Sample volume, m ³	Composition of waste by volume, %	Density kg/m ³
3.8.	Plastic with marking 7	0,00	0,00	0,00	0,00	0,00
3.9.	Other plastic packaging without labeling	4,60	0,61	0,12	0,60	38,33
3.10.	Other plastics	13,00	1,73	0,03	0,13	500,00
4.	Composite packaging	31,50	4,20	1,54	7,72	20,45
4.1.	Tetra-pack type packaging	14,00	1,87	0,54	2,71	25,93
4.2.	Other composite packaging	17,50	2,33	1,00	5,01	17,50
5.	Metals	33,20	4,43	0,66	3,29	50,65
5.1.	Packaging (containers) made of ferrous metals	20,80	2,77	0,26	1,30	80,00
5.2.	Packaging (containers) made of aluminium	10,00	1,33	0,38	1,90	26,32
5.3.	Other ferrous metals	0,00	0,00	0,00	0,00	0,00
5.4.	Other metals (non-ferrous)	2,40	0,32	0,02	0,08	154,84
6.	Biowaste	198,10	26,41	3,74	18,77	52,91
6.1.	Food waste	58,50	7,80	0,25	1,25	234,00
6.2.	Waste from green spaces	137,70	18,36	3,44	17,25	40,03
6.3.	Other biodegradable waste	1,90	0,25	0,05	0,27	35,19
7.	Wood	0,00	0,00	0,00	0,00	0,00
8.	Textiles	49,80	6,64	0,64	3,21	77,81
8.1.	Clothing and footwear	24,20	3,23	0,48	2,41	50,42
8.2.	Other textile materials	25,60	3,41	0,16	0,80	160,00
9.	Waste electrical and electronic equipment	7,60	1,01	0,07	0,33	114,80
9.1.	Small municipal appliances and parts	6,40	0,85	0,06	0,32	101,59
9.2.	Computer equipment	0,00	0,00	0,00	0,00	0,00

No.	Name of the MW faction	Weight, kg	Waste composition by weight, %	Sample volume, m ³	Composition of waste by volume, %	Density kg/m ³
9.3.	Televisions and other devices containing a cathode ray tube	0,00	0,00	0,00	0,00	0,00
9.4.	Lamps with low energy consumption	1,20	0,16	0,00	0,02	375,00
10.	Waste batteries and accumulators	4,00	0,53	0,00	0,02	1307,19
11.	Hazardous waste	7,00	0,93	0,06	0,30	118,76
11.1.	Fluorescent lamps	0,00	0,00	0,00	0,00	0,00
11.2.	Unused medicines and their packaging	1,20	0,16	0,03	0,13	48,00
11.3.	Syringes	0,00	0,00	0,00	0,00	0,00
11.4.	Mineral oils (technical)	0,00	0,00	0,00	0,00	0,00
11.5.	Gas canisters	5,20	0,69	0,02	0,12	226,09
11.6.	Paint	0,00	0,00	0,00	0,00	0,00
11.7.	Other hazardous waste	0,60	0,08	0,01	0,05	55,56
12.	Bulky municipal waste	15,20	2,03	0,22	1,09	69,72
13.	Municipal C&D waste	49,20	6,56	0,15	0,75	328,00
13.1.	Concrete	0,00	0,00	0,00	0,00	0,00
13.2.	Asphalt	0,00	0,00	0,00	0,00	0,00
13.3.	Lumber	48,80	6,51	0,12	0,60	406,67
13.4.	Drywall	0,00	0,00	0,00	0,00	0,00
13.5.	Mixed construction waste	0,40	0,05	0,03	0,15	13,33
14.	Residual municipal waste	50,70	6,76	0,41	2,06	123,66
15.	Total	750,00	99,99	19,95	100,00	37,60

List of references

1. Order of the Ministry of Communities, Territorial and Infrastructure Development of Ukraine No. 409 of 03.05.2024 "On Approval of Methodological Recommendations for Determining the Morphological Composition of Municipal Waste". URL: https://rada.info/upload/users_files/04388478/9920006ccaf9d75a69cb5247b8a915a9.pdf
2. Press release of the project "Best practices of bio-waste management in small municipalities of Ukraine". URL: <https://zerowaste.org.ua/2024/05/29/pres-reliz-proyektu-krashhi-praktyky-upravlinnya-biovidhodamy-v-malyh-gromadah-ukrayiny/>