



SUSTAINABLE
PLASTIC
RECYCLING
IN MONGOLIA

WHO PRODUCES OUR WASTE?

BRAND AUDIT REPORT



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INTRODUCTION

Since 2018, Ecosoum has been working on setting up a proper waste management system in Khishig-Undur soum, Bulgan aimag, with the initial and renewed support of The Asia Foundation. From 2020, Ecosoum’s activities became a part of the “Sustainable Plastic Recycling in Mongolia” project funded by the SWITCH-Asia-II program of the European Union¹, in partnership with four other partners working at the aimag and Ulaanbaatar level.

Although waste management in Khishig-Undur soum still has room for improvement to tend towards zero-waste at the soum level, accomplishments of the past years have enabled a relatively advanced level of waste sorting, collecting and processing – both locally and through urban reusing and recycling channels. Nevertheless, it is clear that satisfying solutions – from technical, logistical and/or financial standpoints – are currently not available for some types of waste. In fact, to this day, some of the waste produced in the highest amount are still being massively discarded in dumpsites, even when theoretically reusable or recyclable.

In line with the #BreakFreeFromPlastic global movement² (of which Ecosoum is a Core Member) and consistently with the explanations and conclusions of our *Zero Waste and Circular Economy* report³, Ecosoum considers that companies who sell the products and packaging that end up constituting most of our waste (glass bottles, and jars, plastic containers and bags, Tetra Paks, metal cans and so on) have the responsibility to take direct and significant action to reduce and manage this waste, in collaboration with other relevant actors such as public authorities. As demonstrated in our *How to balance waste management budget at the soum level* report⁴, it is virtually impossible for Mongolian soums (and most likely aimag-centers and Ulaanbaatar) to establish financially sustainable waste management systems if these companies don’t get involved. Consistently with the 3R principle⁵, these companies should modify their practices so as to decrease the total amount of non-reusable/recyclable waste in the first place; and they should support public administrations to properly and sustainably manage the waste produced in each soum (as well as in aimag-centers and Ulaanbaatar).

In order to identify the Mongolian companies that should be most involved and the types of waste that most urgently need to be tackled, Ecosoum carried out a brand audit of the waste produced in Khishig-Undur soum – following the steps of many #BreakFreeFromPlastic members⁶. The goal was to find out, among the most common types of waste collected in the local waste management facility, what specific items are the most problematic in terms of waste management and what companies produce and/or commercialize these items on the market – and thus should contribute extensively to managing them.

¹ www.switch-asia.eu/project/sustainable-plastic-recycling-in-mongolia/

² www.breakfreefromplastic.org

³ Ecosoum, *Zero Waste and Circular Economy: The Way Forward*, 2021 (all reports produced by Ecosoum are available on our website: www.ecosoum.org/en-resources-and-reports).

⁴ Ecosoum, *How to balance waste management budget at the soum level*, 2022.

⁵ 3R: Reduce, Reuse, Recycle. The principle is that we should first try to reduce the amount of waste we produce, then favor direct reusing, and in last resort promote (effective) recycling.

⁶ #BreakFreeFromPlastic, *Branded, In Search of the World's Top Corporate Plastic Polluters*, Volume [1](#) (2018), [2](#) (2019) and [3](#) (2020) – available on www.breakfreefromplastic.org/brandaudittoolkit/.

METHODOLOGY AND GENERAL CONSIDERATIONS

GENERAL INFORMATION ABOUT WASTE PRODUCTION IN KHISHIG-UNDUR

According to the waste composition studies Ecosoum carried out in 2019 and 2020, most of Khishig-Undur’s waste is constituted of stove ash, glass, food, plastic, and baby diapers.⁷ These 5 categories of waste constitute almost 90% of all household waste (in weight), although we found also a significant amount of Tetra Paks⁸ and metal cans. Excluding stove ash, average weekly household waste production is approximately 3.5kg, which means over 180 kg per year. According to our researches, waste produced by local institutions and shops essentially include the same categories of waste (although in different proportions) – adding up to a soum-level total waste production close to 200 tons per year (excluding ash).

SELECTION OF AUDITED WASTE

To conduct this audit, we decided to focus on the most common types of waste produced, sorted and brought to our waste management facility by the local waste producers. Stove ash and food waste were excluded from the study, not only because they can easily be managed locally without raising any serious environmental issue, but also because they are not linked to any specific companies, nor call for modifications in industrial processes – which is the ultimate goal of this report.

Baby diapers were also excluded from this study, although they add up to 8% of all household waste on average (and are the number one type of waste in households with infants). The main reason is that people don’t sort and bring baby diapers to the waste management facility (they dispose them with unsorted ultimate waste). This situation made it impossible for us to conduct a brand audit on diapers along with other categories of waste. However, as baby diapers do cause significant environmental problems⁹, it shall be necessary, in the framework of a subsequent dedicated study, to clarify the situation and call all responsible parties to adequate changes.¹⁰

In the end, based on the above-mentioned considerations, we decided to focus this brand audit on the following eight categories of waste, which constitute the bulk of the sorted waste to manage in Khishig-Undur:

- | | |
|--|--|
| 1. Glass bottles; | 5. Plastic bags and wrapping (“soft” plastic); |
| 2. Glass jars; | 6. Aluminum cans; |
| 3. PET bottles; | 7. Steel cans; |
| 4. Non-PET plastic containers and items (other “hard” plastics); | 8. Tetra Paks. |

⁷ Ecosoum, [Waste management baseline study report in Khishig-Undur soum](#), 2021.

⁸ For ease of language, we use the term “Tetra Pak” in this study to refer to all drink containers made of carton, plastic and aluminum layers– although, strictly speaking, Tetra Pak is a specific brand.

⁹ Makós-Chelstowska and all. [Environmental problems and health risks with disposable baby diapers: Monitoring of toxic compounds by application of analytical techniques and need of education](#), TrAC Trends in Analytical Chemistry, Vol. 143, 2021.

¹⁰ Similarly, we did not include other types of waste such as paper, fabric, electronic waste and batteries because they account for a very small part of total waste production. However, some of these types of waste are very hazardous for health and the environment; therefore, adequate managing solutions shall also be assessed and implemented as soon as possible.

The audited waste comprised all the waste (of the above-mentioned categories) that was sorted and brought by local waste producers (households, public institutions and private businesses) to Ecosoum's temporary collection point and to new waste management facility in Khishig-Undur soum, between the end of year 2021 and mid-April 2022.

Overall, more than 20,000 pieces of waste (adding up to over 2 metric tons) were included in this study.

CLASSIFICATION PARAMETERS

After at-source pre-sorted waste was collected, Ecosoum further classified it into the above-mentioned eight categories and proceeded to their audit one after the other. For each piece of waste, the following information was gathered:

- Name of the product or brand;
- Name of the Mongolian company/corporation producing or importing this item;
- Type of product (e.g. vodka, soda, dairy, cleaning product, etc.);
- Type of material (e.g. glass, PET, aluminum, etc.);
- Origin of production (Mongolia or imported);
- Best possible waste management process (reusing, recycling, downcycling, landfill);
- Number of occurrence of each item in the audit sample;
- Average and total weight of each item in the audit sample.

The categories for "type of product" were developed and adapted progressively throughout the audit so as to grasp the diversity of items without making the classification unnecessarily heavy. In the end, we kept a total of 26 subcategories of product, although for each type of waste we only find 2 to 13 categories maximum.

These categories, in alphabetical order, are the following:

- | | | |
|-------------------------------|------------------------------------|--------------------------------------|
| - Beer; | - Milk; | - Soap and shampoo; |
| - Candy; | - Other food; | - Soda; |
| - Car product; | - Other goods; | - Vegetables and fruits (cans/jars); |
| - Cleaning product; | - Other items (non-packaging); | - Vegetal oil; |
| - Coffee and tea; | - Other liquor; | - Veterinary product; |
| - Dairy; | - Other plastic bags and wrapping; | - Vodka; |
| - Grocery and vegetable bags; | - Praying oil; | - Water; |
| - Health and body care; | - Protective plastic; | - Wholesales wrapping; |
| - Juice; | | - Wine. |

TERMINOLOGY OF WASTE MANAGEMENT PROCESSES

Since, as we stressed in our *Zero-Waste and Circular Economy* report, the word “recycling” is broadly misused and instrumentalized, it seemed essential to make a difference between *recycling* and *downcycling* when we analyzed the possible processing channels.¹¹ Following broadly accepted terminology, we considered the pieces of waste that can be recycled into a similar item as truly recyclable, while we preferred the concept of “downcycling” for pieces of waste that are actually transformed into new items of lower quality (which don’t close the circular economy loop and end up in landfills after having been downcycled – usually only once).

We classified the pieces of waste that are systematically taken back by producing industries for reusing as “reusable”. We did not take into account the fact that, occasionally, some containers like glass jars are locally reused for other local products (because such “reusing” is negligible from an overall waste management standpoint). All other pieces of waste, for which reusing, recycling or downcycling channels are not currently available in Mongolia at a systemic level, were classified as ultimate waste disposed in landfill.

DATA COLLECTION AND PROCESSING

Through the audit, all this information was entered into Excel tables (one per category of waste) and the data was processed and analysed after all the waste included in this study was audited. After all the detailed data was finalized, some information was regrouped to run both detailed and overall analyses.¹²

For all items that were encountered a significant number of times, a dedicated line was created in the relevant Excel tables. Products that were similar in all measured features (e.g. Fanta and Sprite PET bottles) were regrouped as a single entry to ease the auditing process and data analysis. The items that were found only on rare occasions and/or for which brands and companies were not clearly identifiable were regrouped in “others / unidentified” entries. When such “others” items clearly belonged to different categories of product (e.g. dairy, cleaning product, etc.), separate “others / unidentified” entries were created in order to measure and count as many features as possible.

For standardized items (e.g. Arkhi 0.5L glass bottle), unit weight was precisely measured at the beginning (usually by weighing an average sample of 6 to 10 items) and total weight of all items was subsequently calculated. For non-standardized items (e.g. plastic bags and wrapping), actual weight was measured through the entire audit and average weight was subsequently calculated back from total weight.¹³

¹¹ The “best possible waste management channels” are intended as of May 2022 in Mongolia, without taking into account processing technologies that exist in other countries (or expected in the future) but are not currently available in real life to manage waste in our country. In addition, classifying a waste as “reusable”, “recyclable” or “downcyclable” does not mean that it is necessarily processed this way; it only refers to the best option currently available for processing if all other necessary operations (sorting, collection, transportation, etc.) are perfectly implemented beforehand.

¹² The database constituted in the framework of this audit and analyzed in this report is available on Ecosoum’s website (www.ecosoum.org/en-resources-and-reports).

¹³ The point of measuring both number of items and weight of items for each entry was to analyze and moderate the relative importance of each category of waste when they have very different densities (e.g. the same weight of PET and glass bottles correspond to very different number of items, which translate into different waste management issues).

LIMITS OF THE STUDY

Besides the fact that some types of waste were not included in the audit, the main limit of this study is linked with the representativity and the extrapolability of the collected data: formally speaking, our results are only representative of Khishig-Undur soum (or, more precisely, of the specific waste producers who brought their sorted waste to Ecosoum). Nevertheless, as there is no reason to consider that Khishig-Undur soum's waste producers have significantly different consumption patterns from the rest of the Mongolian population (at least in rural areas), we consider our conclusions valid for the entire country.

Similarly, the relative share of each type of waste and each identified company could have been biased not only by the consumption patterns of each waste producer, but also by the way the latter sort their waste: for example, if several households properly sorted and brought only PET bottles to Ecosoum, it could have led to an over-representation of this type of waste (and of the companies primarily linked to it) in the final results (although it would not impact the relative importance of companies within each category). However, through the entire collection period we observed that almost all households who brought their sorted waste to the collection points systematically came with many bags containing virtually all types of waste. As such, there is no reason to suspect that they didn't properly sort each category of waste nor that the final results are significantly biased. Therefore, we can consider that our data is representative of the overall waste production.

It is also possible that, in some cases, we failed to notice that some small companies actually belong to larger groups – and are thus presented in our data as the main producer/importer company. However, this possibility could only slightly attenuate the predominance of the main groups (but not to artificially increase it).

Contrarily, it is not impossible that, occasionally some imported products were wrongly associated to a single importer although they are actually imported by several different companies. Nevertheless, this kind of approximation is rare and concern only imported products found in small amount. We should also mention that on the rare occasions where a specific imported product appeared a significant number of times but its importer was either unidentified or multiple (at least two companies importing the same product), we kept a dedicated entry for the said products (rather than aggregating them with the 'others / unidentified') and registered the importing company as '#brand# importer' (e.g. *Gut & Günstig importer*). Therefore, the main trends are not impacted by these negligible errors, which have no significant effect on the conclusions of this report when it comes to identifying the main waste producing companies.

In the end, only little information (which did not have a real impact on the production and analysis of the data) could not be gathered properly. This missing information essentially comes down to the names of importers of waste categorized either as non-PET plastic or as steel can. However, considering the relative share of each category in the overall audited waste, this missing information has no significant impact on the results of this audit.

Therefore, this study's results, despite minor imprecisions and missing information, can be considered as strong and reliable evidence on which subsequent actions can be built.

DATA ANALYSIS AND RESULTS

Only the main data and results are presented and discussed in this section. However, the complete and detailed audit tables and charts are regrouped in the Excel table openly available on Ecosoum’s website.

OVERALL ANALYSIS

Overall, 20,047 pieces of waste were audited, for a total weight of 2,140kg. Out of them, 13,562 (68%) were made of plastic, 3,734 (19%) of glass, 1,879 (9%) of metal and 872 (4%) were Tetra Paks. Considering the heavy weight of glass, the repartition by weight places glass waste in first position with 73% (1,570kg) of the total weight, followed by plastic (23% / 495kg), metal cans (2% / 40 kg) and Tetra Paks (2% / 35kg).

If we look at each of the eight audited categories (see Figure 1), we found that PET bottles constitute the first category of waste (33%) by number of occurrence (6,674 items). However, through the prism of weight, glass bottles represent almost two thirds (65%) of the total weight (1,387kg).

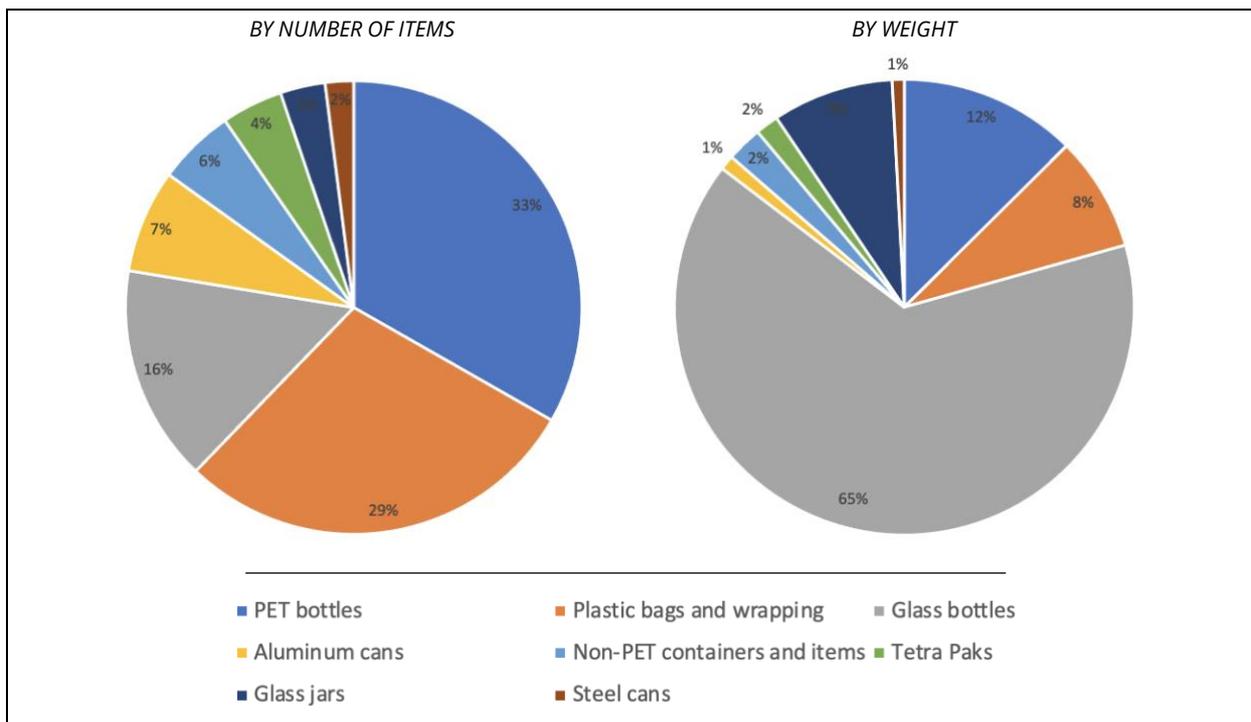


Figure 1 : Distribution of audited waste by type of waste (by number of items and by weight)

The first clear finding of this study is that most of the waste to manage is constituted of food and drink packaging: together, food and drink packaging account for almost 80% of all the audited waste (in weight, their share even adds up to 93%). Almost all the rest is made of plastic packaging for other types of goods and of various kinds of other plastic bags and wrappings (see Figure 2). However, at least half of these other plastic bags and wrappings actually correspond to the wholesales wrapping of food and drink products (e.g. plastic wrapping around a pack of PET bottles): this means that, overall, direct and indirect packaging of food and drink probably represents over 90% of all the sorted waste collected in the waste management facility.

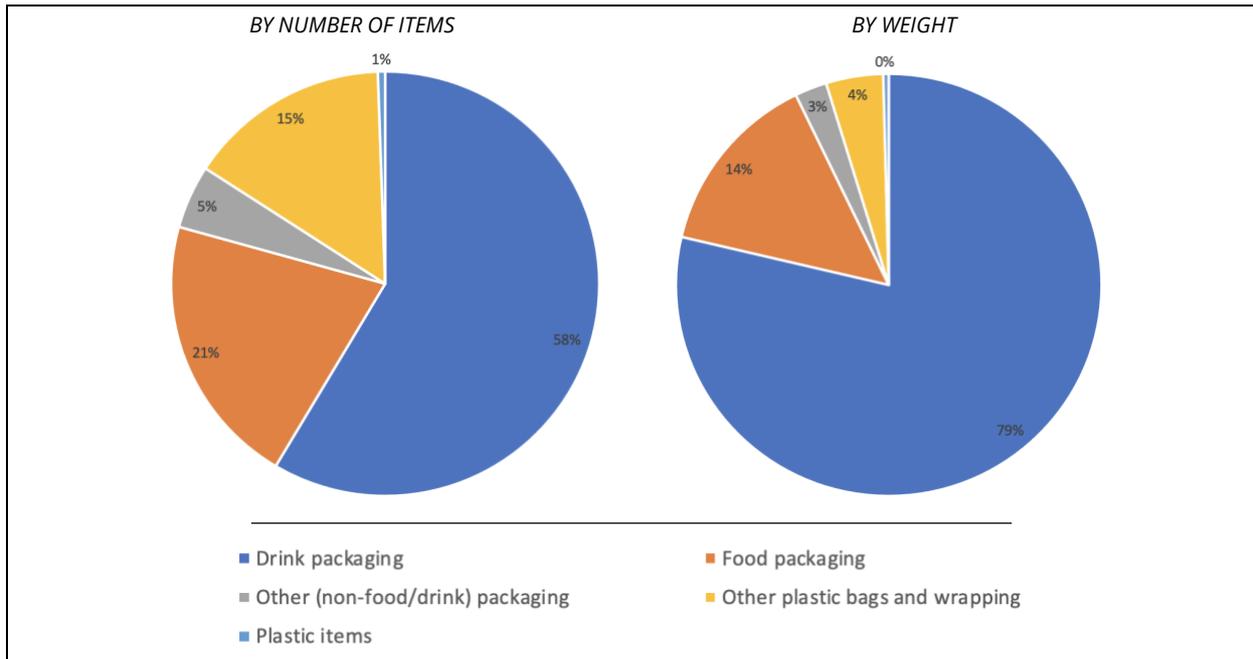


Figure 2 : Distribution of audited waste by main category of product (by number of items and by weight)

If we analyze into more detail (see Figure 3), we observe that the top 6 categories of audited waste, which make up for almost 75% of the total, are packaging for soda (19%), “other” foods (14%), beer (13%), vodka (11%), and juices (8%), as well as wholesales plastic wrapping (10%). If we count by weight, vodka bottles alone represent more than half (52%) of all audited waste.

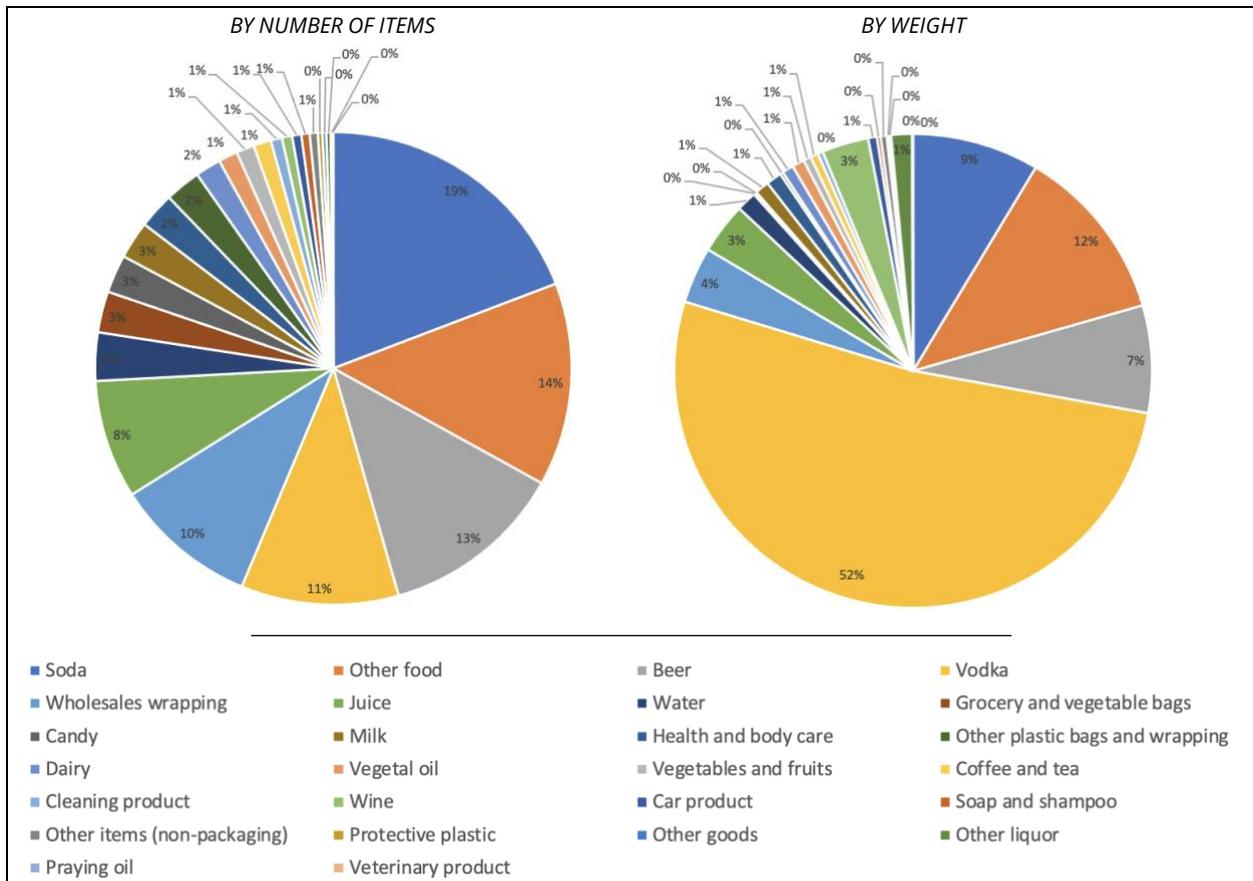


Figure 3 : Distribution of audited waste by subcategory of product (by number of items and by weight)

Between 58% (if we count by item) and 74% (if we count by weight) of all audited waste correspond to products produced in Mongolia, and 21 to 25% come from imported products. The remaining 5 to 17% of unclear origin are all plastics and mainly correspond to wholesales wrapping, non-branded neutral plastic bags or single-use containers and packaging (see Figure 4).

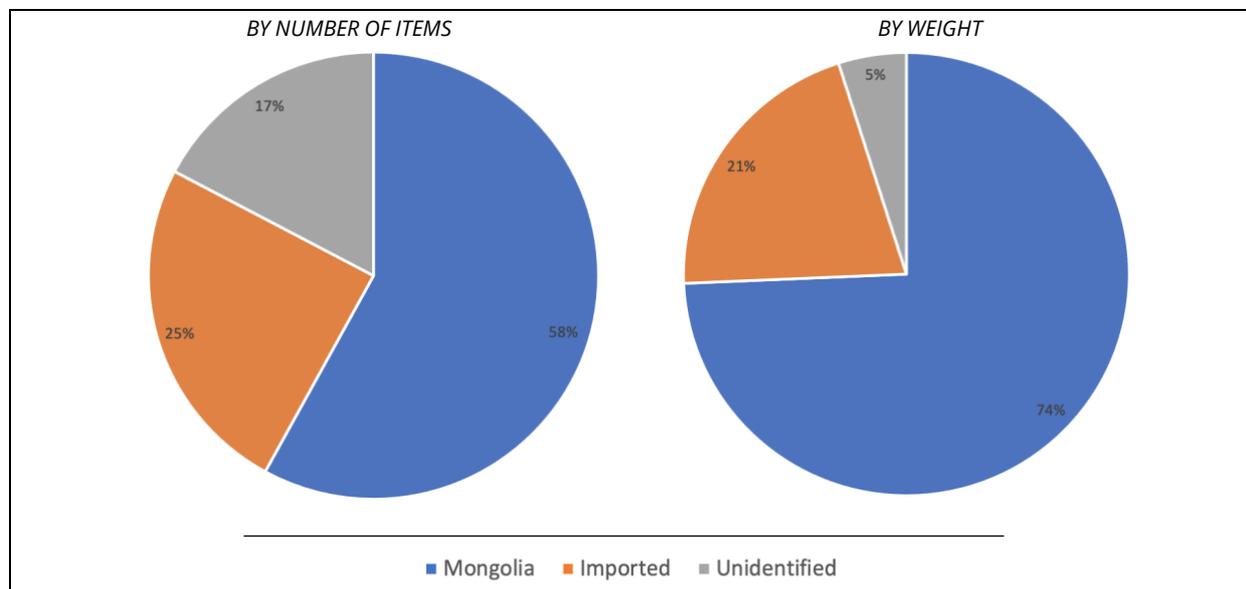


Figure 4 : Distribution of audited waste by origin of production (by number of items and by weight)

When we look at possible waste management processing channels (see Figure 5), we find that most of the audited waste could be processed in today's Mongolia either through downcycling (79% by number / 44% by weight) or reusing (12% by number / 52% by weight) channels. This means that, in theory, only 4 to 9% of all audited waste have no other solution but to be disposed in landfill, which could appear as a relatively positive observation.

However, it is essential to insist on the fact that our data regarding possible processing channels certainly don't reflect the current real-life situation in Mongolia: our results don't show that only 4 to 9% of all waste are disposed in landfills today; but that in an ideal best-case scenario (where all types of audited waste would find their way to the most suitable waste management processing channels that already exist in Mongolia) 91 to 96% of waste could potentially be diverted from landfill.

The actual situation now in Mongolia is undoubtedly far from reaching such a high diversion rate. Incidentally, this observation does not even take into account any financial or logistical constraint that would necessarily arise if all this waste was properly sorted and channeled. Similarly, it disregards the fact that a significant part of "recyclables" is actually lost and wasted throughout the recycling processes.¹⁴

More importantly, even if we assume that this ideal scenario could be reached, our results show that this best-case scenario is extremely far from a circular economy because the vast majority of

¹⁴ For example, even in the world's most advanced PET recycling facilities, the material loss rate is app. 30%. In other words, for 100 PET bottles entering the recycling plant, 30 are actually not recycled but become waste. (See: Recycling Today, [Alpla Coca-Cola FEMSA invest \\$60M in Mexican PET recycling plant](#), January 31, 2022; or: Waste Management World, [CarbonLITE Opens 'World's Largest' Bottle-to-Bottle Recycling Plant in Pennsylvania](#), October 23, 2020).

audited waste is neither reusable nor truly recyclable in today's Mongolia¹⁵, as they should be in compliance with the 3R principle.

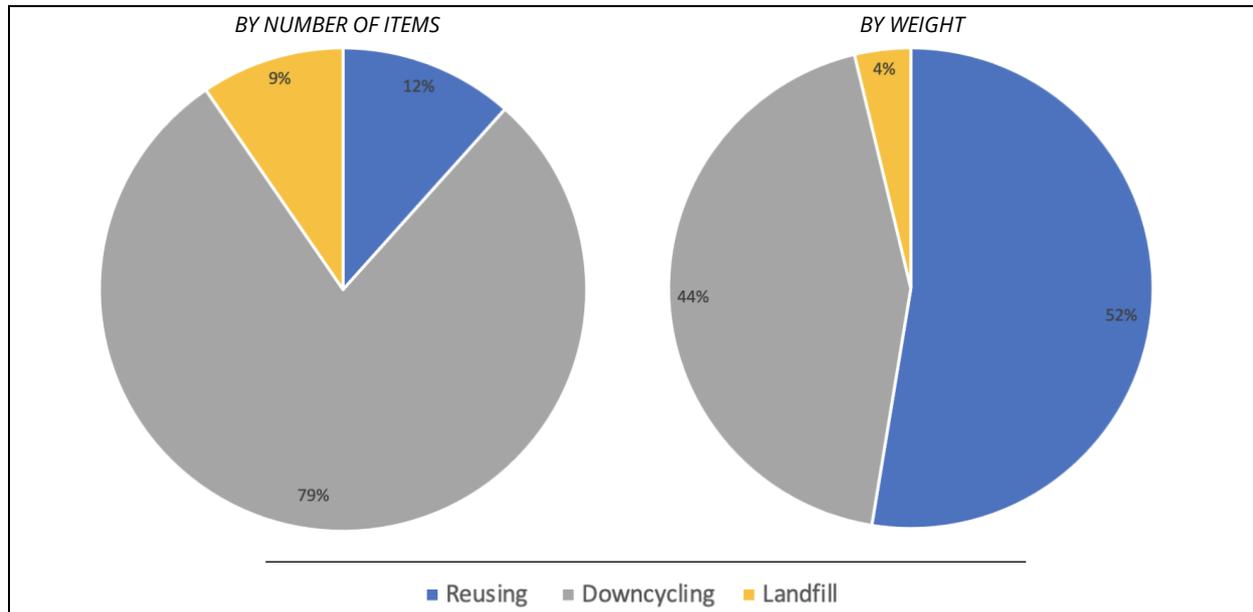


Figure 5 : Distribution of audited waste by waste management processing channel (by number of items and by weight)

Finally, if we consider all 20,047 audited items, we find that a large majority of it comes from a very limited number of companies (see Figure 6). In number of items, 5 companies only produce half (50%) of all waste: APU (22%), MCS (15%), Vitafit (7%), GEM (3%) and Khikh LLC (2%).¹⁶ Through the prism of weight, these companies appear even more predominant (69% of the total) – especially APU, which alone represents almost half (46%) of all audited waste.¹⁷

If we go into the detail of the other half of the audited items, we find a much wider diversity of products and companies (more detail is provided below in the analysis by type of item). But this aggregated “others” group constitutes the blind spot of this study: many plastic-wrapped imported products (cookies, candies, chips, cleaning products, etc.) could not be clearly associated with a single specific Mongolian importer or distributor, which mechanically led to leaving them out of our podium. If we could have linked all imported products to their importers and distributors, our study would most certainly have highlighted the significant role played in overall waste production by major Mongolian companies such as Nomin Holding, Altan Joloo Group, Tavan Bogd Group, Altai Holding LLC, Orgil LLC, Bayasakh Trade LLC or Maximum Distribution LLC.¹⁸

¹⁵ When we investigated the “recycling” processes currently implemented in Mongolia for each category of audited waste, it appeared that none of them actually met the requirements to be defined as true “recycling” (according to the definition provided in the methodology section). Waste processed by these industries are systematically transformed into a lower quality product that does not close the circular economy loop, which is why they were all classified as “downcycling”.

¹⁶ GN Beverages also appears in these main waste-producing companies, but it actually belongs to GEM and Vitafit, which is why we can consider that only 5 main companies account for half of all audited waste. It should also be mentioned that, in comparison with the diversity of products commercialized by the top 4 companies (APU, MCS, Vitafit, GEM), Khikh LLC does not seem to really belong in the same group because it is only responsible for importing a specific category of product (Korean energy drinks).

¹⁷ The order of importance of the following three companies varies whether we count by number (MCS – Vitafit – GEM) or by weight (GEM – MCS – Vitafit), but both counting methods confirm their predominance after APU.

¹⁸ Although clear and exclusive link with all the products they trade could not extensively be made in this study, these companies repeatedly emerged through our audit in several of the waste categories.

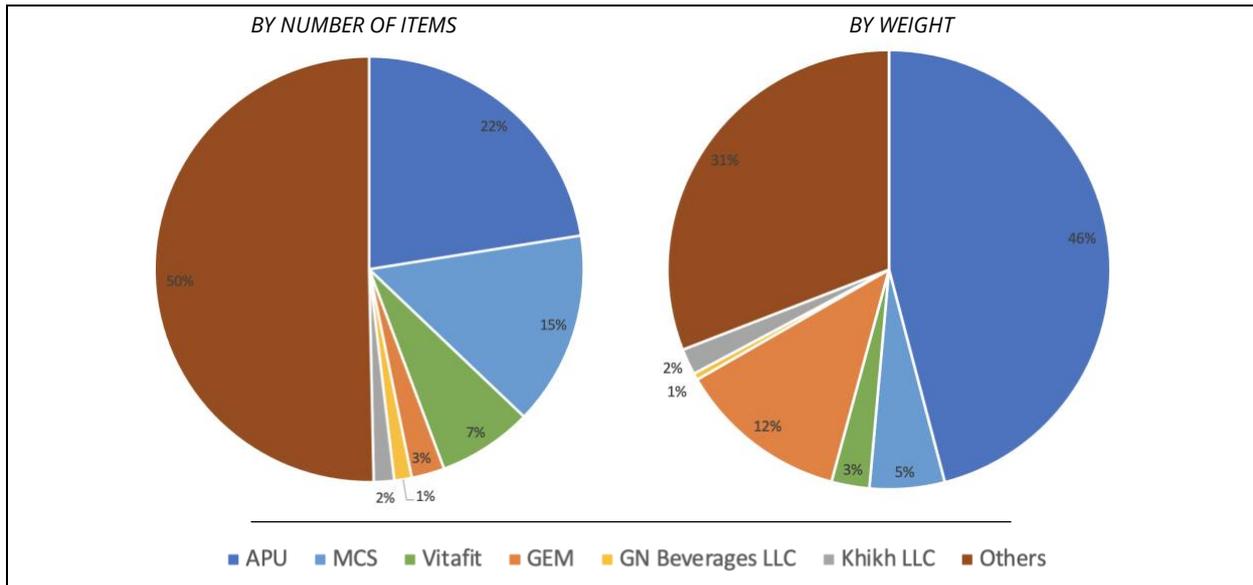


Figure 6 : Distribution of audited waste by company of origin (by number of items and by weight)

PLASTIC WASTE

If we focus on plastic, we first observe that PET bottles account for app. half of all the plastic waste (49% in number / 54% in weight). Considering that a large part of the wholesales wrapping actually comes from packs of PET bottles, the importance of PET is most likely even more significant that it first appears (see Figure 7).

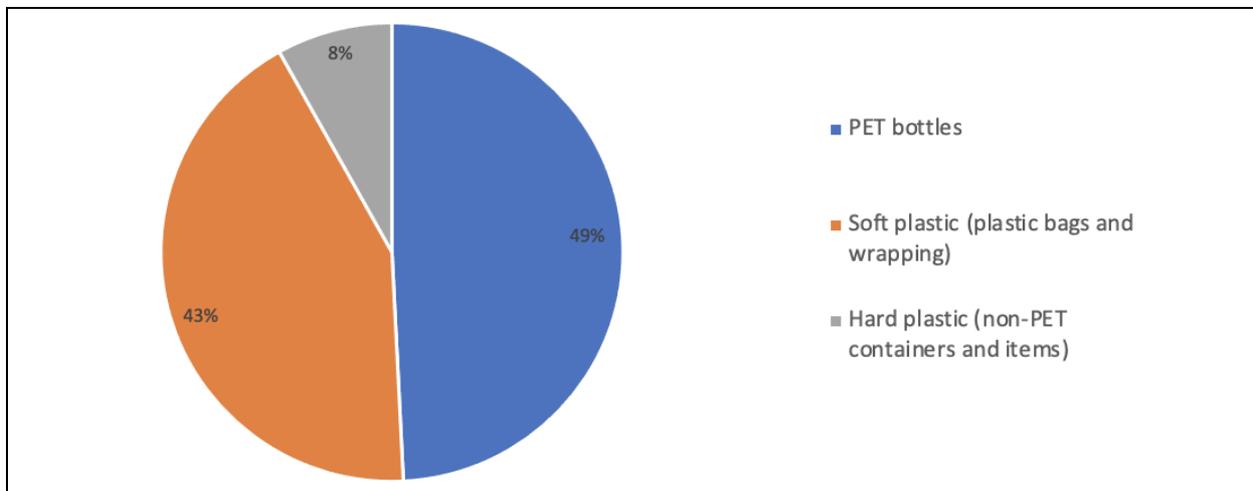


Figure 7 : Distribution of plastic waste by type of item (by number of items)¹⁹

This observation leads to conclude that the companies using PET bottles should be considered as the primary stakeholders when it comes to plastic waste management. According to our data (see Figure 8), 75% of all PET bottles come from only 3 companies: MCS (43%), APU (17%) and Vitafit (16%). If we look at the top 10 PET bottles producers, we found that the following seven companies (which add up to 12% of the total) are GN Beverages (4%), MGL aqua (2%), Lucha (2%), Altanboshgo (1%), Monjuice (1%), Monos Group (1%) and GEM (1%).

¹⁹ For the results by category of waste (plastics, glass, etc.), the figures present only one chart (by number of items or by weight), because the results are essentially alike (due to similar densities within a given category).

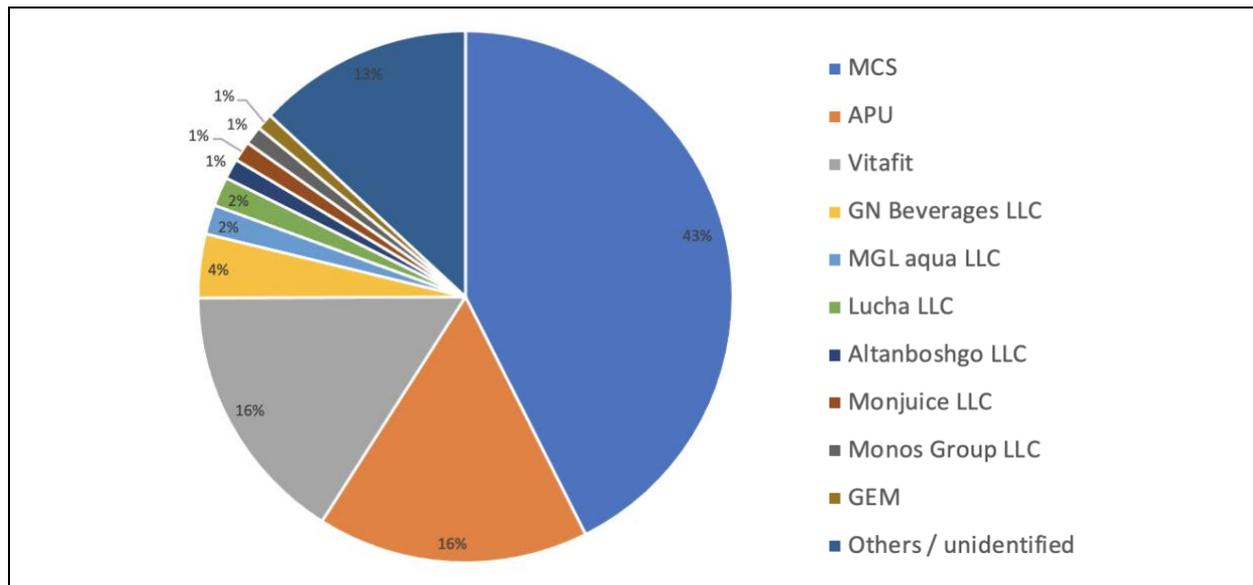


Figure 8 : Distribution of PET bottles by company of origin (by number of items)

In theory, PET is usually considered “recyclable”²⁰, which means that, if all necessary conditions were reunited (sorting, collection, etc.), most of this waste could be diverted from landfills. However, in today’s Mongolia, PET bottles that are sorted and collected can only be downcycled into lower grade products²¹.

If we look at other types of “hard” plastic waste (although they appear as a secondary issues since they represent only 8% of all audited plastics), we found a much wider diversity of products and companies, many of which were complicated to identify (partly because a majority corresponds to imported products). Nevertheless, we can clearly observe that the number one product, which alone represents 12% of all non-PET hard plastics, is the “Goë”-branded yogurt produced by the Mongolian company Vitafit.

Food packaging represents more than half of this category of plastic, and other types of consumer-goods – such as cleaning products, health and body care products, soaps, shampoos and car products (mainly motor oils) – account for most of the rest (see Figure 9). It is thus clear that, even if the brand of each specific product could not be always clearly identified, the main consumer-goods producers, importers and marketers are to be considered responsible for most of this category of plastic waste.

As mentioned above, and despite the fact that it was impossible for us to link each product to a single and specific importer, companies such as Nomin Holding, Altan Joloo Group, Tavan Bogd Group, Altai Holding LLC, Orgil LLC, Bayasakh Trade LLC or Maximum Distribution LLC are probably at the origin of most of this plastic waste.

²⁰ This statement is actually arguable since, as mentioned above, the waste rate for most advanced recycling plants is app. 30%. It means that, at best, it takes 1.4 old PET bottles to create a new one, which does not entirely close the loop and keep producing a very significant amount of waste.

²¹ According to our information, no PET bottle waste produced in Mongolia is recycled into new bottles. Most of it seems to be exported to China (usually under the form of PET pellets), where it is most likely used in textile or carpet industries rather than to produce new bottles.

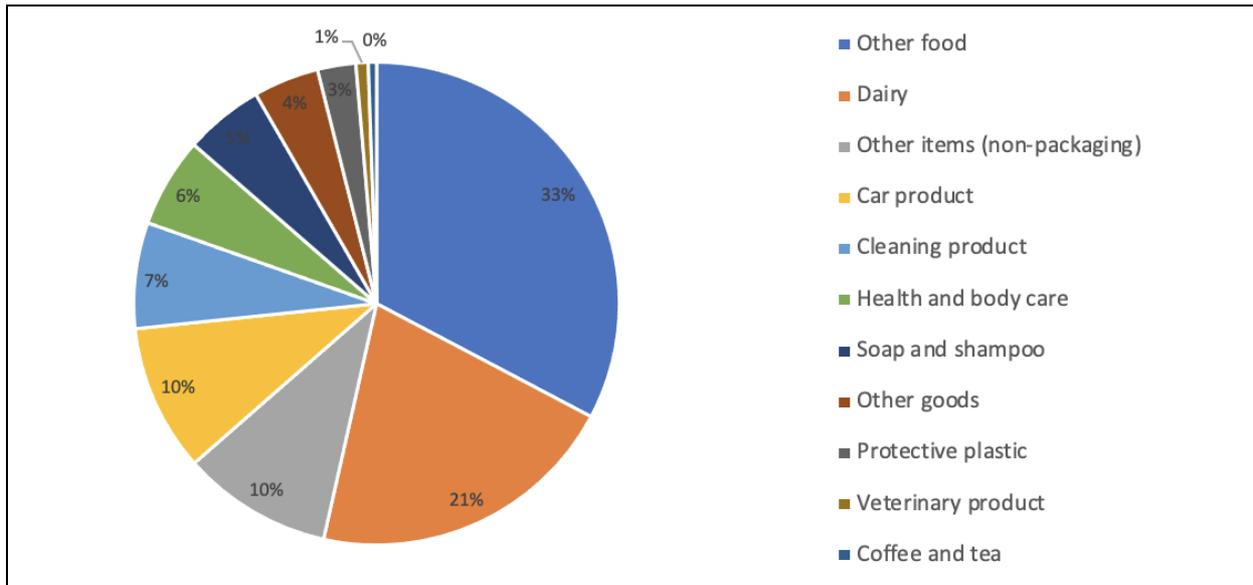


Figure 9 : Distribution of non-PET hard plastics by type of product (by number of items)

When it comes to “soft” plastic bags, packaging and wrapping – which represent 35% (in weight) to 43% (in number) of all plastic waste) – we also face difficulties to identify brands: firstly because there are hundreds of different products (many of which are imported), and secondly because the majority of soft plastics are not branded at all. 34% of the total corresponds to wholesales wrapping, 10% are grocery and vegetable bags and 8% are other types of neutral plastic bags and wrappings – non-branded bags and wrapping thus add up to more than half of all “soft” plastics (see Figure 10).

In any case, like for “hard” plastics, “soft” plastics essentially comprise direct and indirect packaging, bags and wrapping for consumer-goods. This means that the same companies as previously mentioned should be considered responsible for this waste.

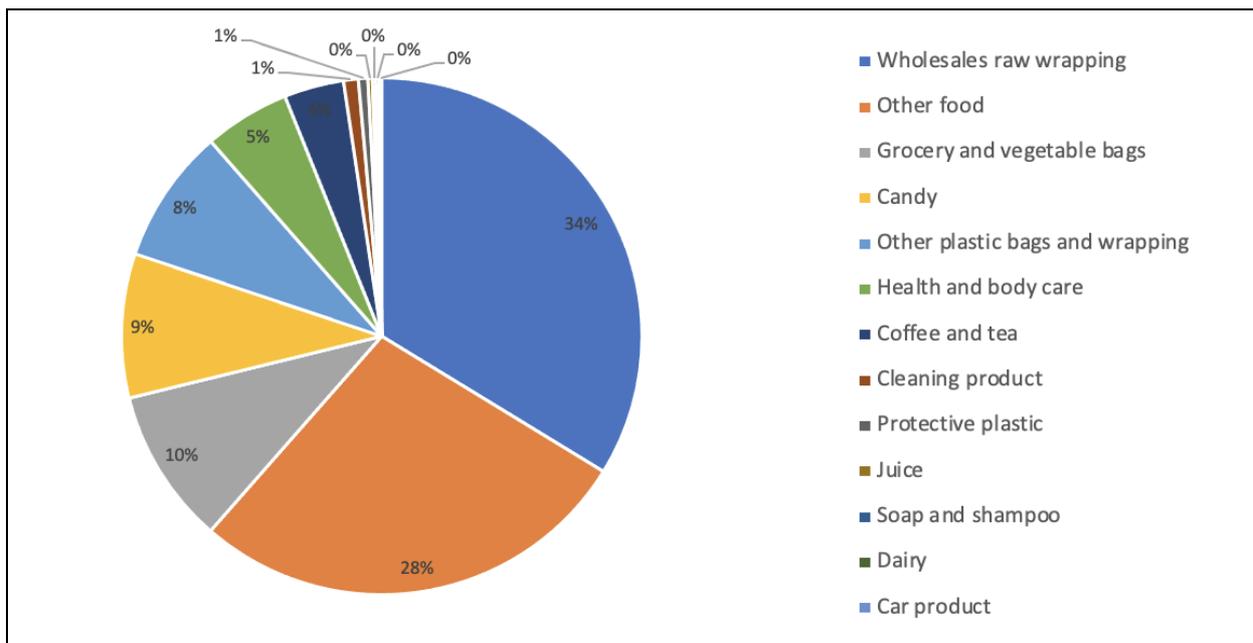


Figure 10 : Distribution of soft plastic bags and wrappings (by number of items)

Overall, if we look back at plastic waste as a whole, we observe that food and drink packaging account for at least 70% (even more if we include indirect packaging such as wholesales wrapping) – PET bottles alone being number one by far as they represent more than half of all plastic waste.

In the end, regardless of the difficulties to identify some importers and marketers behind part of the total plastic waste, three main companies clearly emerge from this analysis: adding up to app. half of all plastic waste (including wrapping), MCS, APU and Vitafit can be considered as the main plastic waste producers in Mongolia (see Figure 11).

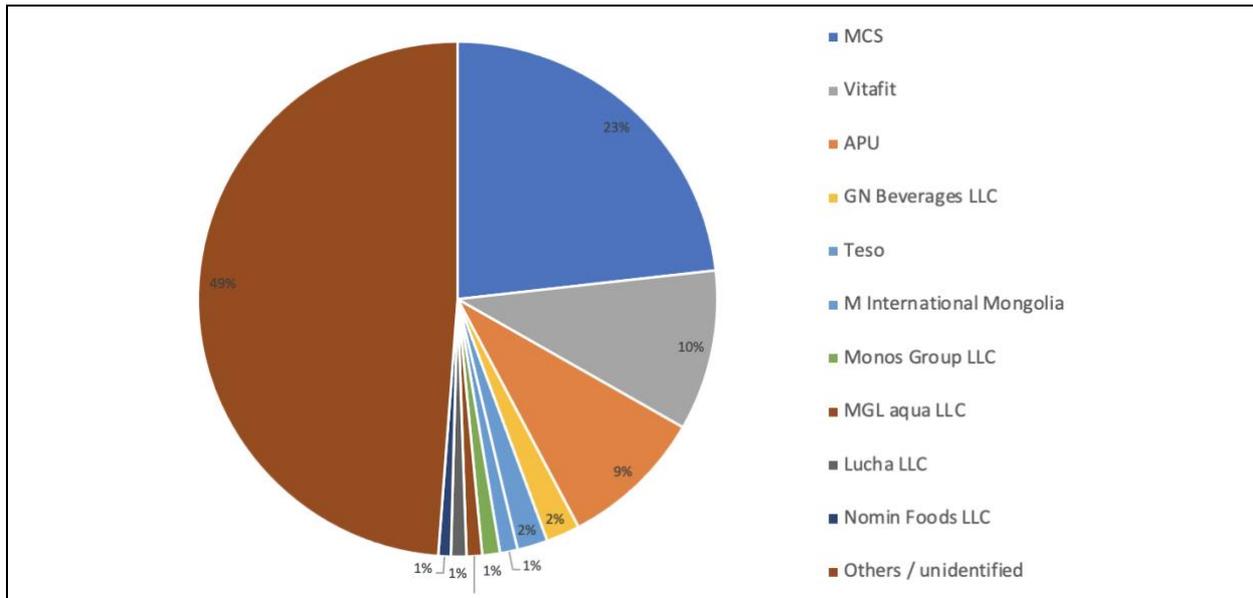


Figure 11 : Distribution of all plastic waste by company of origin (by weight)

GLASS WASTE

Regarding glass waste, data analysis brings even clearer results and conclusions. First, we observe that most of glass waste are bottles (83% in number / 88% in weight), while only a small minority (17% / 12%) are glass jars (see Figure 12).

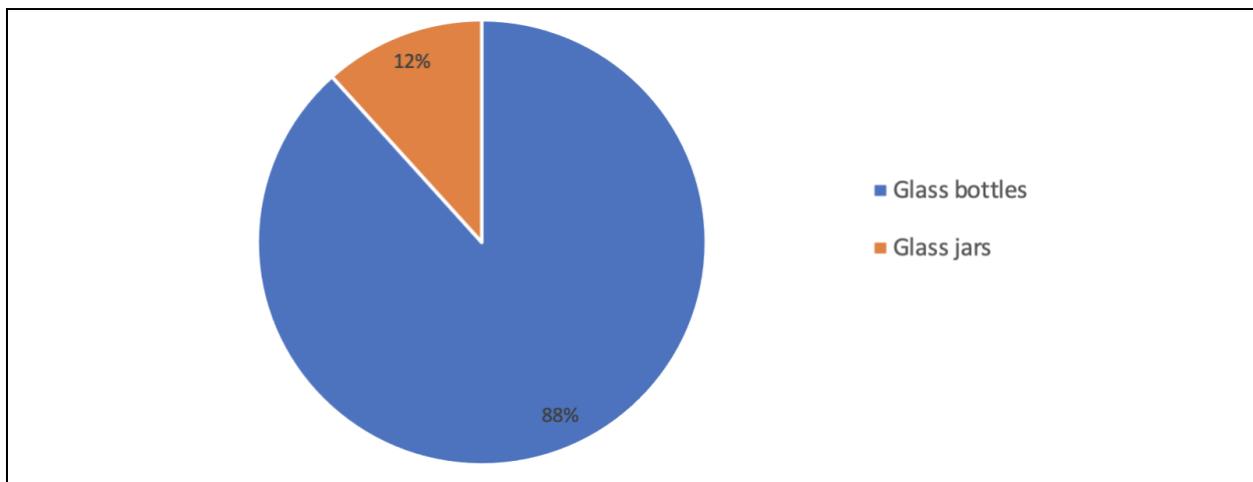


Figure 12 : Distribution of glass waste by type of item (by weight)

More precisely, we find that 80% (close to 70% if we count by number of item) of glass bottles are vodka bottles, which means that 71% of total glass waste’s weight corresponds to vodka bottles (Figure 13).

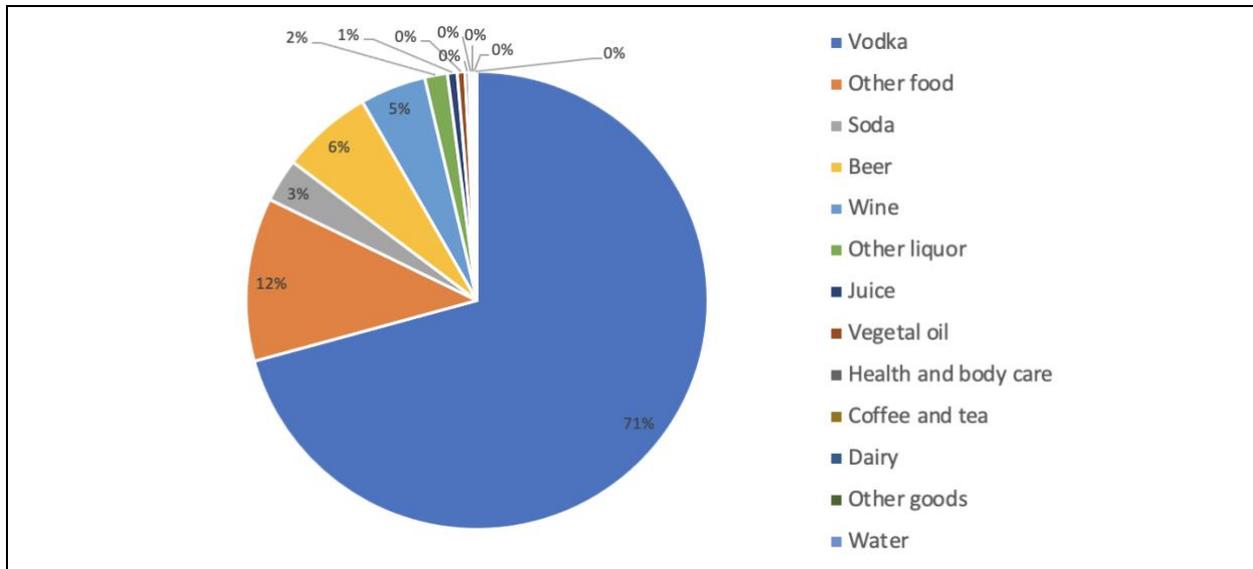


Figure 13 : Distribution of glass waste by type of product (by weight)

The fact that glass waste primarily comes from vodka bottles leads to clearly identifying two main glass waste producers (adding up to 76% of audited bottles and 85% of the total weight) : APU, with 60% of all the audited glass bottles (66% by weight), and GEM, with 16% (19% by weight). The third main glass bottle producers (with 10% of audited bottles, but only 3% of the weight because these bottles are very small) is Khikh LLC, which imports (from South Korea) most of the energy drinks commercialized on the Mongolian market (see Figure 14).

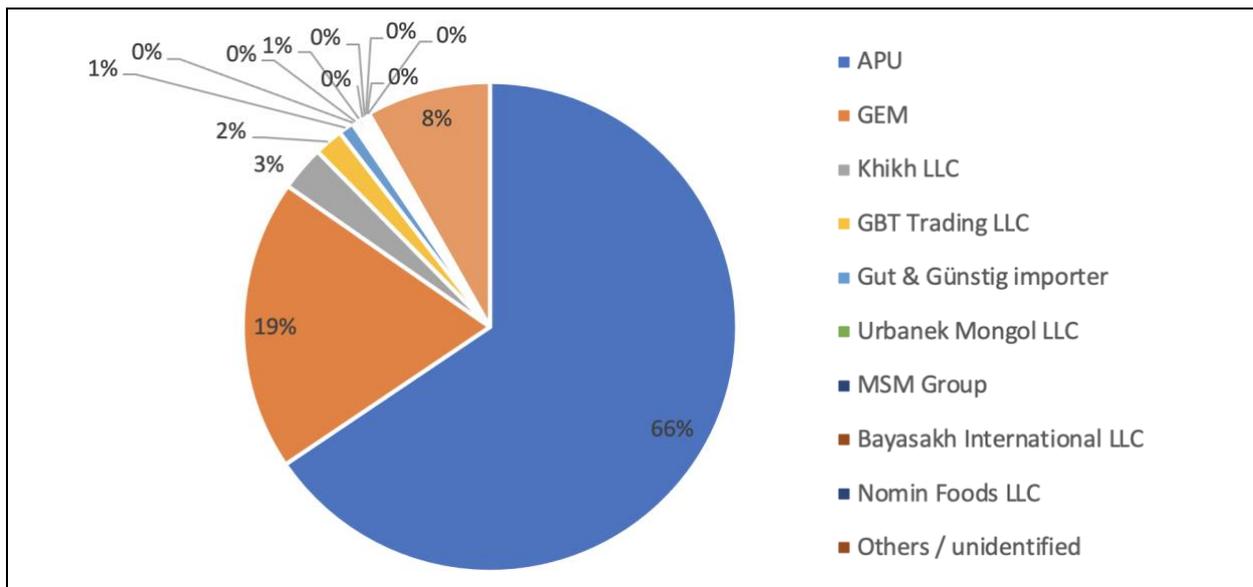


Figure 14 : Distribution of glass bottles by company of origin (by weight)

Regarding glass jars, the number one waste producer is GBT Trading with its Gazar Shim products, although the situation is less concentrated than for glass bottles as this company accounts for

“only” 22% of all glass jars (see Figure 15). The following identified companies are Urbanek Mongol (11%), Bayasakh International (8%), Nomin Foods (6%) and Durvun Ulzii (5%). Gut & Günstig products also represent a significant part of all glass jars (11%), although a single specific importer could not be identified in this study.

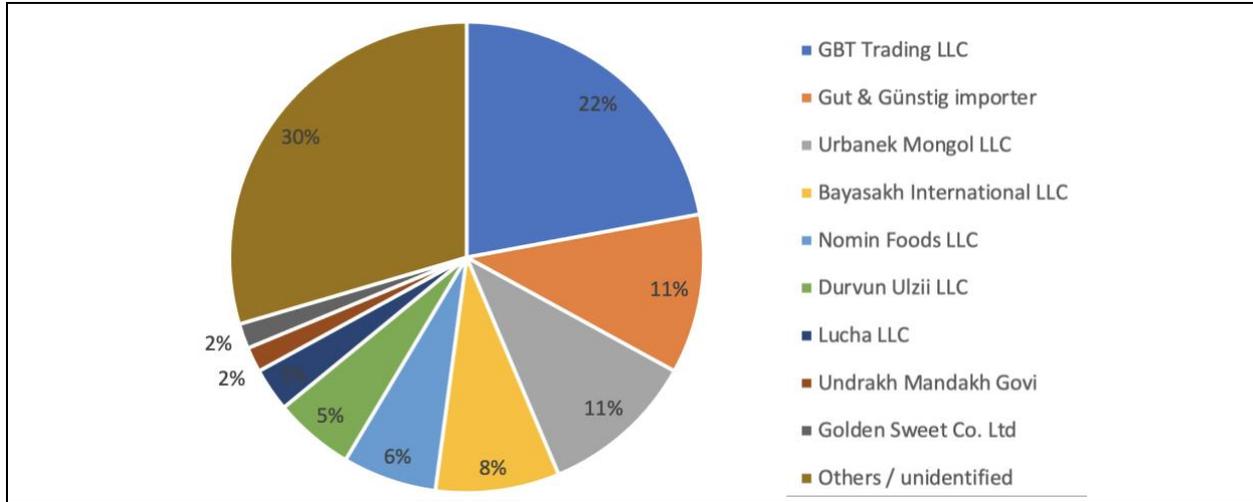


Figure 15 : Distribution of glass jars by company of origin (by number of items)

Overall, this audit thus shows that more than 80% of all the audited glass waste come from only four companies, with one being by far the main producer (see Figure 16): APU (58% of the total weight), GEM (17%), Khikh (3%) and GBT Trading (2%).

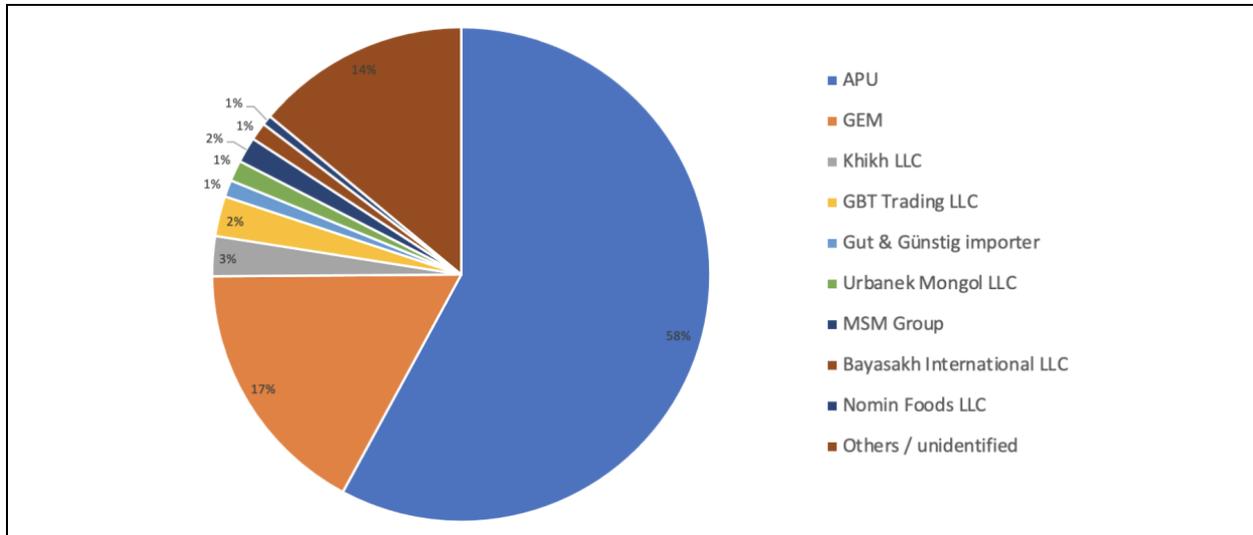


Figure 16 : Distribution of all glass waste by company of origin (by number of items)

If we look at waste management processes, we find a situation that theoretically seems more satisfying than for plastic: according to each company's current buy-back policy, 72% of all glass waste (by weight – 62% if we count by number of item) could be sold back and reused at a systemic scale in today's Mongolia (see Figure 17).²²

²² It should however be mentioned that only GBT Trading currently accepts to take back their standard jars and the identical ones coming from other companies. All the other companies simply refuse to take-back and reuse anything.

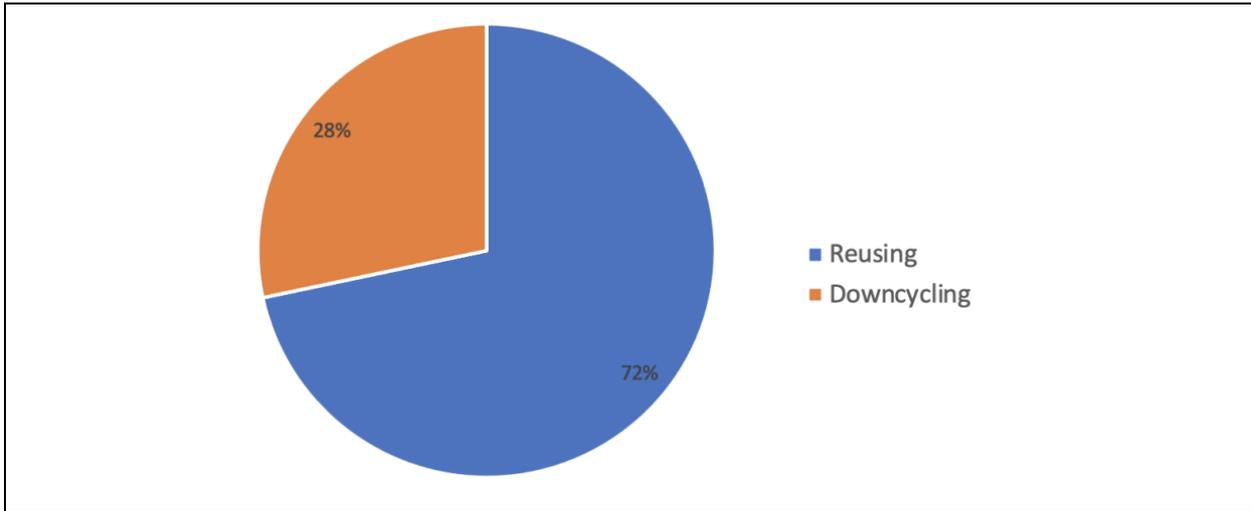


Figure 17 : Distribution of glass waste by waste management process (by weight)

However, this observation calls for at least two important comments. First, by contrast, it means that app. 38% of all glass waste items (28% by weight) are currently excluded from take-back/reusing policies (including within companies that have a take-back policy in place but refuse some of their items). This ratio appears very high since there is no reasonable excuse for some companies to refuse reusing their containers while others do.

Second, and more importantly, this reusing ratio remains much more theoretical than observed in real-life. This statement does not refer only to the fact that few glass waste are currently being sorted and collected for reusing; but more worryingly because even when glass bottles and jars are properly sorted and collected, companies often refuse to buy-back most of them (even for the items they theoretically claim to accept) due to alleged damages or poor condition.

METAL WASTE

For aluminum cans, our study shows an extreme concentration of the waste production (see Figure 18) : 87% of aluminum cans come from APU alone, followed by MCS (3%) and Nomin Foods (2%).

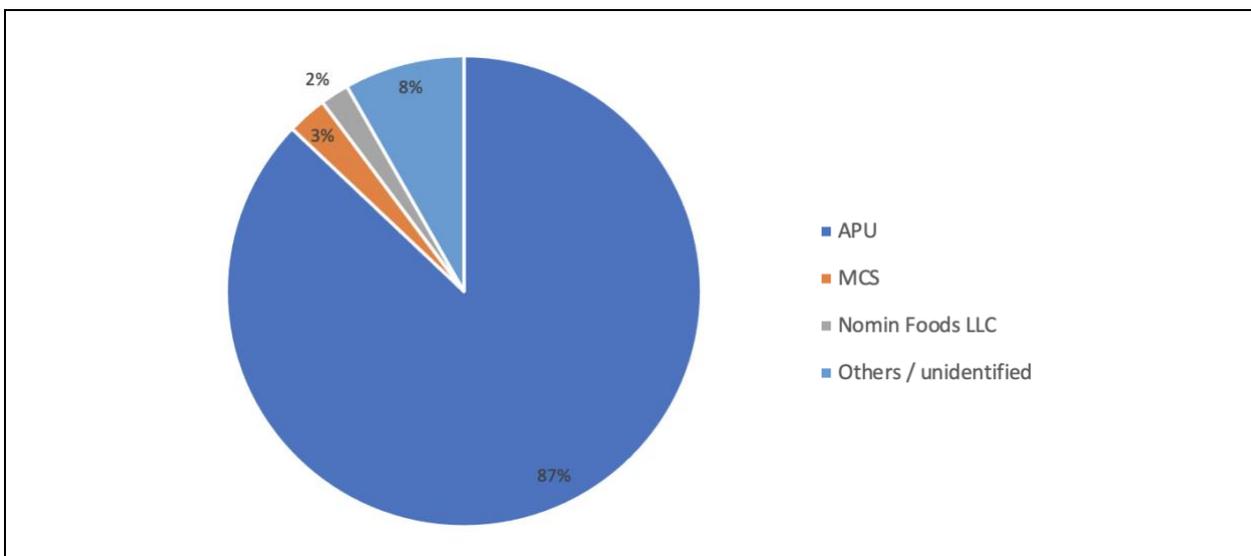


Figure 18 : Distribution of aluminum cans by company of origin (by number of items)

Although aluminum cans are effectively recyclable in theory, we could not find any company in Mongolia that currently does recycle aluminum. According to our findings, the only Mongolian company that transforms aluminum waste in our country actually manufactures ship anchors that are subsequently exported. It seems that some aluminum cans are also exported without any prior transformation. Although it is possible that some of them are actually recycled into new aluminum cans abroad, we found no specific information in the framework of this study. Therefore, all aluminum waste are classified as “downcyclable” at best in today’s Mongolia.

Contrarily to aluminum cans, which are exclusively used for drink packaging, steel cans are essentially used for food packaging (vegetable and fruit cans accounting for 61% of all steel cans, far ahead of dairy and other food products). In this area, results appear less clear regarding the originating companies as 43% of all audited steel cans could not be clearly associated with a specific Mongolian company – one of the reasons being that 98% of steel cans are imported (whereas 87% of aluminum cans are Mongolian).

The relative share of each importer should thus be handled with caution as it is probable that a significant number of unidentified items that were aggregated in the “others / unidentified” group are actually imported by one of the identified importers in unknown proportions. Nevertheless, one importer seems to emerge from the others: Cosmo Trade Co. Ltd, with 42% of all audited steel cans (see Figure 19).

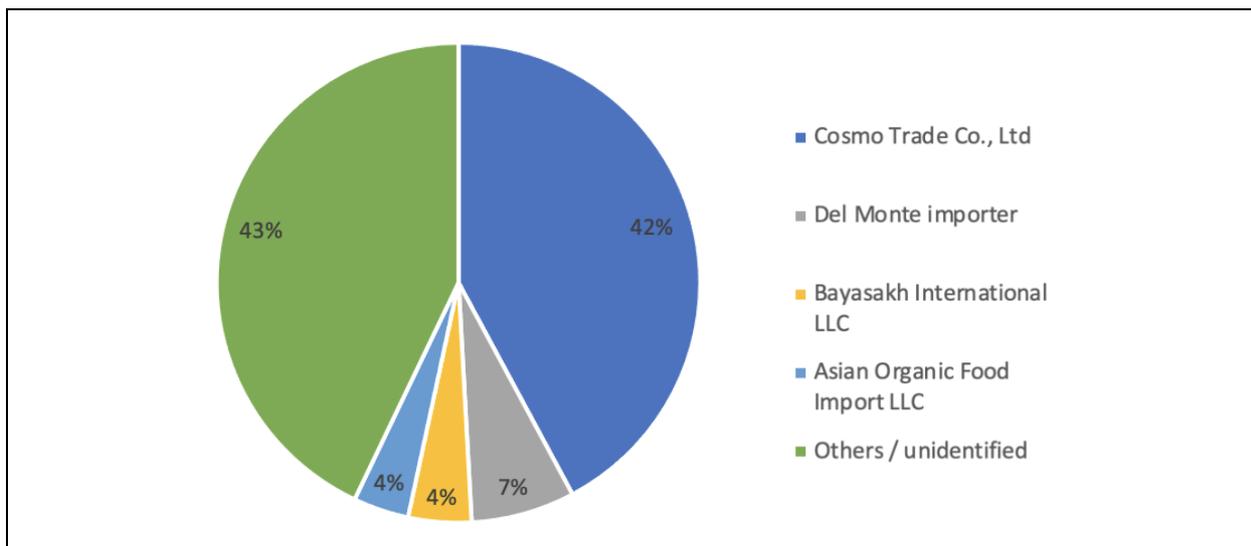


Figure 19 : Distribution of steel cans by company of origin (by number of items)

In any case, contrarily to aluminum cans which can easily be sold to recyclers, it currently (as of May, 2022) seems impossible to find a recycler (nor any buyer) in Mongolia for steel cans. This situation led us to consider that, as of today, all steel cans in our country can only end up in landfill – which is even more unfortunate because steel is almost infinitely recyclable (and, until recently, used to be accepted and purchased by some waste management middle-men).²³

²³ All contacted stakeholders claimed that, although it used to be possible to recycle steel cans, most of the latter now include some substances (additionally to steel) that make cans impossible to recycle.

TETRA PAKS

Regarding Tetra Paks, two main companies emerge from the others (see Figure 20): APU (30%) and Vitafit (27%) – followed by Vitsamo (11%), MonFresh (7%), MCS (5%), Nomin Foods (5%), Suu (5%) and Teso (4%).

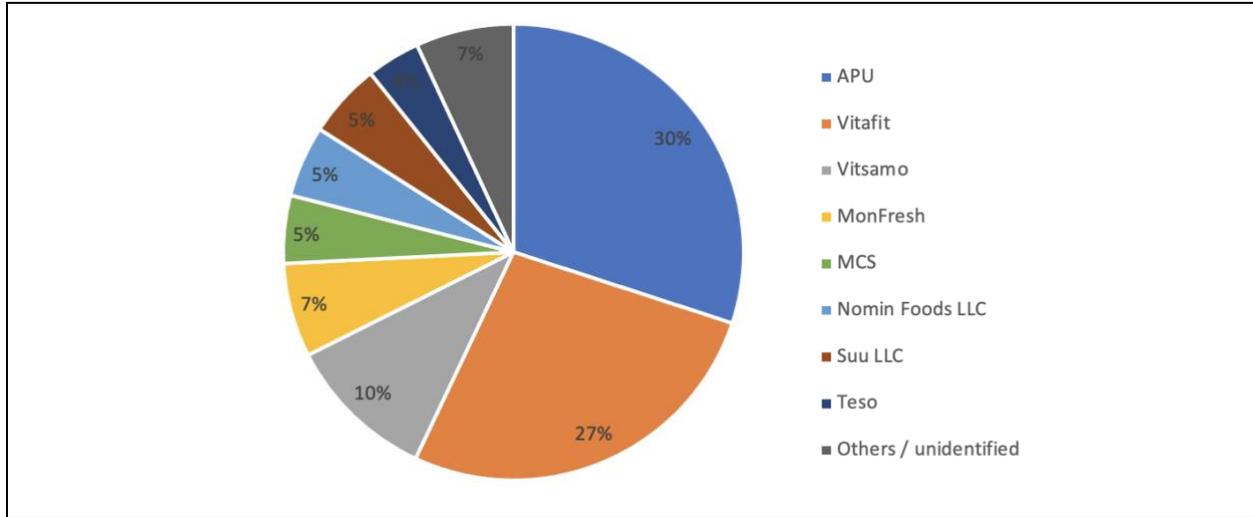


Figure 20 : Distribution of Tetra Paks by company of origin (by number of items)

These Tetra Paks are mainly used either for milk (59%) or for juices (35%) – see Figure 21. These products are essentially (83%) produced in Mongolia (17% imported). All of them can only end up in landfills as there is currently no recycling/downcycling processing channel for Tetra Paks in Mongolia.²⁴

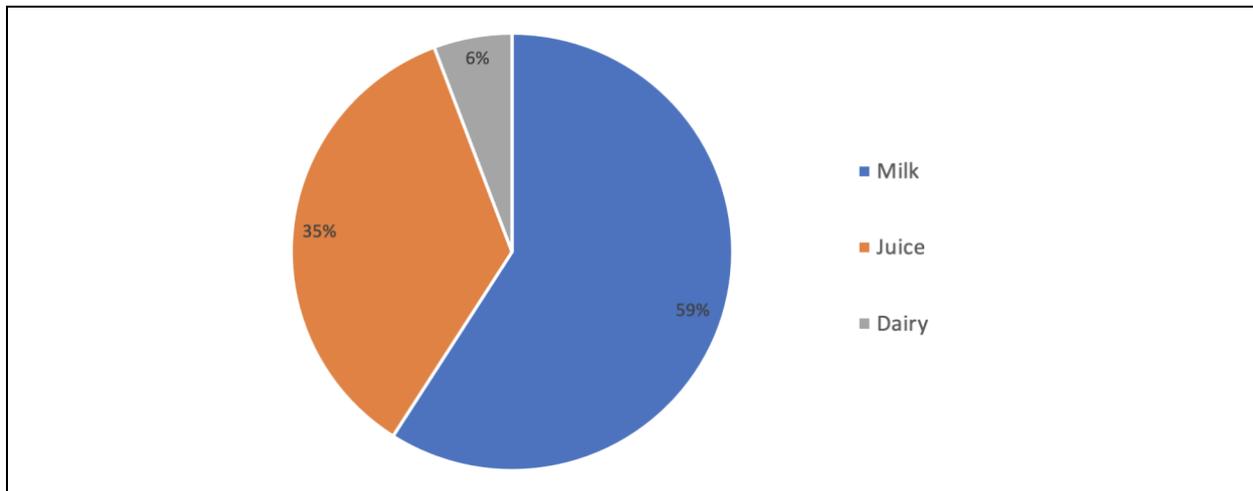


Figure 21 : Distribution of Tetra Paks by type of product (by number of items)

²⁴ Incidentally, it should be mentioned that despite the claims of companies such as Tetra Pak, this kind of multi-layer (75% carton / 20% plastic / 5% aluminum) packaging is not truly recyclable anywhere else in the world. Although the carton part can in fact be transformed into new paper/carton (where specialized facilities exist), the plastic and aluminum components are, at the very best, downcycled into lower grade products. In reality, the downcycling processes for the plastic and aluminum parts of Tetra Paks essentially remain at the pilot/development level and are not implemented at industrial scale.

CONCLUSIONS AND RECOMMENDATIONS

SUMMARY CONCLUSIONS

After auditing over 20,000 pieces of waste collected and sorted in Khishig-Undur soum's waste management facility, clear conclusions emerge from this analysis.

Regarding the companies at the origin of the waste:

- Overall, **direct and indirect packaging of food and drink products represents over 90% of all audited waste**. Therefore, it is clear that Mongolian food and drink companies altogether must play an active and central role in finding and effectively implementing adequate solutions to the current waste crisis.
- In line with the fact that app. half of all audited plastic are PET bottles, the main companies behind plastic waste are primarily the major Mongolian drink producers: **MCS is at the origin of 23% of all audited plastics, ahead of Vitafit (10%) and APU (9%)**.
- The origin of glass waste is even more concentrated, dominated by the vodka sector: **APU is responsible for 66% of all glass waste, followed by GEM (19%)**.
- **Aluminum cans are mostly produced by APU (87%)**, essentially for beer.
- The **main identified importer for steel cans is Cosmo Trade Co. (42%)**, although other major but not clearly identified importers must also play a significant role.
- **Tetra Paks are primarily produced by APU (30%), Vitafit (27%) and Vitsamo (10%)**.
- For some categories of waste dominated by imported products (especially "soft" plastic packaging and wrapping), importers and/or distributors could not always linked with their products be clearly and exclusively. However, import and distribution companies such as **Nomin, Altan Joloo, Tavan Bogd, E-mart, Orgil, Bayasakh Trade or Maximum Distribution** came up regularly throughout the audit.

Regarding the waste management processing channels:

- Overall, **only 12% of all audited waste can (at best) be processed by reusing in today's Mongolia** (52% if we count by weight, due to the heavy weight of glass).
- **None of the audited waste can be effectively recycled** in today's Mongolia, but **79% could (at best) be downcycled** (44% by weight).
- Only **4 to 9% of all waste has theoretically no other solution than disposal in landfill**, although the actual landfilling rate in today's Mongolia is actually much higher.
- In reality, the **reusing and downcycling rates are currently much lower** than the above-mentioned figures, not only because waste is not properly sorted and collected, but also because the **acceptance criteria in reusing/recycling plants are usually very strict** (especially for glass bottles), and lead a large part of the allegedly accepted reusables to dumpsites.

RECOMMENDATIONS

1. OVERALL WASTE PRODUCTION MUST BE REDUCED BY MODIFYING PRODUCTION, PACKAGING AND MARKETING PATTERNS

As demonstrated in our above-mentioned *How to balance waste management budget at the soum level* report, the yearly waste management budget in a soum such as Khihig-Undur can only be in large deficit (app. 20 million MNT) under current conditions. Considering that budget deficit increases with distance from Ulaanbaatar (where most reusing and recycling/downcycling channels are located), the shortfall to establish sustainable waste management systems in all soums of Mongolia certainly adds up to at least to 10 billion MNT per year, probably even more.²⁵

Clearly, no matter who is asked to balance the deficit, it does not seem realistic to consider that waste management budgets could be increased by this much. Therefore, if only for financial reasons (not to mention obvious ecological and ethical considerations), **the first and most important recommendation is to respect the 3R principle and find ways to reduce waste production at the source.**

This means that companies, starting with the ones identified in this study, must adapt not only their production and packaging patterns, but most likely also the way they market their products in order to reduce the production of waste. Alternatives to single-use products and packaging must be used and shorter supply channels must be developed to reduce the need for packaging. When packaging remains unavoidable, more sustainable (reusable, effectively recyclable, compostable, etc.) solutions must be implemented.²⁶

2. LEGISLATIVE FRAMEWORK SHOULD BE STRENGTHENED TO OBLIGE RELEVANT COMPANIES TO TAKE EXTENDED RESPONSIBILITY FOR THEIR WASTE

Even when more sustainable production-consumption practices are eventually implemented, waste management budgets, although (hopefully) more balanced, will probably remain partially in deficit. Considering that consumer-goods companies (especially food and drink sector) are at the origin of most waste to manage and that these companies are virtually the only relevant stakeholders that currently don't play a significant role in managing this waste, it is essential that they finally take action – beyond shallow greenwashing and misleading communication.

Considering that voluntary initiatives from large companies have rarely proved sufficient anywhere in the world to solve any issue of this magnitude, **we recommend that legislative measures are taken as soon as possible, at the national level, to precise and strengthen the definition of “social responsibility”, so as to make sure that concerned companies are obligated to participate, effectively and sufficiently, in establishing sustainable waste management systems.** Incidentally, the legislative framework improvement should also integrate stricter rules regarding marketing channels and production/packaging practices, as recommended above.

²⁵ This figure should be handled with caution and considered as an approximate order of magnitude. Nevertheless, according to our calculations, it does seem as a minimum realistic estimation. In fact, it is rather optimistic because it already includes the income that could be made from sorting and selling all valuable reusable and recyclable waste to relevant industries (under current conditions), which is extremely far from being the case as of today and will probably take many years to become reality. A less optimistic estimation would thus lead to a much higher deficit, especially if we also included Ulaanbaatar in the calculation.

²⁶ More detailed recommendations are presented in our above-mentioned *Zero Waste and Circular Economy* report.

3. RELEVANT COMPANIES MUST CONTRIBUTE FINANCIALLY AND/OR LOGISTICALLY TO ESTABLISH SUSTAINABLE WASTE MANAGEMENT SYSTEMS

Without waiting for the legal framework to be improved, companies must take significant actions to help waste management actors, especially at the soum level, to establish sustainable waste management systems. Such actions should involve financial contribution and direct logistical support, with a focus put on the key constraints that currently make it impossible for local actors to properly manage waste.

More precisely, we recommend that:

- **Relevant companies should provide significant funding to soum (and/or aimag) administrations** to decrease their waste management budget deficits and enable proper waste management systems to be implemented. The amount of this funding should be modulated depending on their practical involvement at key stages of the overall waste management chain.²⁷
- **Relevant companies should systematically buy-back all of their packaging, whether it is reusable or recyclable²⁸ and regardless of the condition.²⁹** Purchasing prices should be modulated depending on the condition of the waste, so as to provide incentives to local-level waste management actors to keep reusable/recyclable waste in the best possible condition (which in turn will enable increasing the reusing/recycling ratio and reducing processing costs for reusers/recyclers). If no other measure is taken to help remote soums, purchasing prices should also be modulated depending on the distance between soum and Ulaanbaatar to at least cover transportation costs.
- After buying all their waste back, in line with the previous recommendation, **relevant companies should have the responsibility to carry out (or subcontract) effective reusing or recycling of this waste themselves.** Indeed, true social responsibility of producers should imply that they are accountable and directly in charge of properly managing their waste rather than relying on the goodwill and efforts of others.³⁰

²⁷ Companies that don't directly participate at any level of the waste management chain should be asked to contribute financially more than those that provide direct logistical support and/or more indirect funding through effective buy-back of reusable waste.

²⁸ It would not make much sense to recommend to transport all ultimate non-reusable/recyclable waste back to the concerned companies because it would only lead to unnecessarily increase transportation (with all associated problems, especially from an environmental standpoint) without contributing to solving the overall waste management issue. However, this recommendation should not lead to put less emphasis on the companies that use non-reusable/recyclable packaging than those that make the effort to improve their packaging – which is why non-reusable/recyclable products and packaging should simply be banned, as previously recommended.

²⁹ It is essential to relieve local-level waste management actors from the burden to segregate themselves the reusable items *that are in good enough condition* for reusing from the ones *that are not* according to companies' standards. In fact, this situation currently creates a very high risk for local actors to pay for sorting, conditioning and transporting pieces of 'reusable' waste (essentially glass bottles and jars) that will eventually not be purchased back by anyone in Ulaanbaatar. This situation thus leads either to increase the deficit in local waste management budgets (transportation expenses higher than actual income from selling reusable waste) and/or to reduce the overall reusing/recycling ratio (to limit the risk of spending money for nothing, local actors might discard reusables in fear of not having them purchased, even when they might actually be). For example, early 2022, Bulgan soum's waste management staff spent countless hours sorting 4 million MNT worth of glass bottles that they considered in good condition; but based on its standards the concerned company paid only 89,000 MNT (app. 2% of the alleged value). In such conditions, no one wants to sort and properly manage glass bottles anymore.

³⁰ For example, after having bought back all their glass bottles and sorted the reusable ones from the damaged ones, vodka companies should be in charge of recycling the broken glass (either by themselves, by delegating to a specialized

- **Relevant companies should facilitate transportation of their reusable/recyclable waste from production areas (soums and aimags) to processing areas (facilities in Ulaanbaatar).** Their vehicles supplying consumer-goods to rural areas should be used to bring back the associated waste to reusing and recycling facilities in Ulaanbaatar.
- To enable, facilitate and reduce overall cost of previous recommendations, **relevant companies should coordinate amongst themselves to mutualize efforts and expenses rather than carrying out identical actions each on their own.** A common operator could be set up and funded by all relevant companies, proportionally to the responsibility of each one. In the same way, joint waste management platforms centralizing all types of reusable and recyclable waste could be set up in key locations to facilitate the link between waste generation and processing areas.³¹
- In line with the 3R principle, **relevant companies should take the lead to increase the waste reusing rate** and, when reusing proves impossible, **increase the effective recycling rate** (rather than being satisfied with *downcycling* that actually does not close the circular economy loop). This means not only setting up and/or supporting relevant effective-recycling facilities³² but also, as previously mentioned, switching to production and packaging processes that really enable recycling rather than downcycling or landfilling.³³
- **Relevant companies should transparently collaborate with rural stakeholders (such as Ecosoum) in establishing pilot systems** consistent with the above-mentioned recommendations. This way, the best solutions for all stakeholders can be designed and tested before scaling up and replicating in the entire country.
- **Above-mentioned “relevant companies” that must take action should primarily be those which were identified in this audit,** although many others should probably be involved as well.³⁴

subcontractor, or by selling glass to a specialized independent recycler). Similarly, companies that market their drinks in PET bottles should not carelessly rely on the sole efforts of local waste management actors and independent PET recyclers: on the contrary, they should coordinate the collection and transportation of recyclables between the other stakeholders, and make sure that operations are financially viable and sustainable for everyone.

³¹ For example, if all reusable and recyclable waste is collected in a single facility in the outskirts of Ulaanbaatar (for example, in Emeelt), it would greatly facilitate and reduce cost of transportation from soums and aimags (rather than having to roam the city to drop each type of waste in different locations). Incidentally, costs could be decreased by decentralizing from Ulaanbaatar to aimag-centers at least some of the reusable/recyclable waste processing operations. For example, creating glass and plastic recycling facilities in remote provinces would reduce the need for transportation. Similar approach could also be applied to consumer-goods production to shorten the marketing circuits and enable closing the loop of reusable packaging at a smaller scale.

³² It is important to highlight that investments in recycling plants must not come in the way of the overall goal to reduce waste production in the first place. As stressed in our *Zero-Waste and Circular Economy* report, massive investments in recycling facilities can lead to justifying ever-increasing consumption and waste production, which is counter-productive. Therefore, multiplying recycling plants, including at aimag-level, should not be seen as the ultimate solution: it should be carefully planned and integrated in a larger plan to reduce waste.

³³ This recommendation involves assessing the relevance of using packaging such as Tetra Paks and multi-layer sachets that can only end up in landfills in today's Mongolia in order to clarify whether it is more relevant to set up new recycling facilities or to switch to alternative packaging. Overall, companies should favor packaging for which realistic recycling processes already exist or are easy to introduce in Mongolia rather than count on high-techs that are too expensive or complicated to implement in the Mongolian context.

³⁴ Although information such as market share by company for each type of product is not transparently available to everyone, relevant companies do know who their main competitors are and which other companies should also be held accountable for each type of waste. If other big relevant companies were not identified in this audit, the responsibility falls on the identified ones to clarify which other companies should also be involved.