Parallel realities

Managing plastic packaging waste in Bulgaria beyond official statistics

Report

Za Zemiata
Friends of the Earth Bulgaria

ZERO WASTE EUROPE

Contents

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Executive summary

Waste management that meets the circular economy requirements is a challenge for all European Union countries, and even more so for a newer member like Bulgaria, which faces financial constraints. However, the data analysed in this report suggests that Bulgaria's waste management issues stem less from resource limitations than from weaknesses in the way it is structured. In comparative terms, 1.2% of all public spending in Bulgaria in 2022 was allocated to waste management—almost double the EU average. Despite this, the level of waste recovery achieved is unsatisfactory, and public opinion regarding these efforts does not rate them highly.

This report aims to clarify, as much as possible , the discrepancies in the data on waste in Bulgaria, as summarised from various official sources, with a focus on plastic packaging waste. First, the current model involving several private organisations for packaging waste management is reviewed. The report then examines issues with packaging waste management at the municipal level. While it is commonly accepted that Bulgaria has successfully transposed EU waste management legislation, this analysis shows that regulatory standards in Bulgaria are, in fact, very low. The report draws attention to (plastic) waste incineration projects, which have multiplied in recent years. Finally, possible solutions to improve the management of plastic waste packaging in Bulgaria are outlined.

One of the key weaknesses of the system as a whole is the quality of the statistical information on waste available. For instance, there are significant discrepancies between the data about packaging put on market as reported by the packaging waste recovery organisations (PROs), and the same data collated at the national level. Different institutions collecting data on the same material flows often state different numbers — a flaw that has already been identified in institutional analyses, but remains unresolved. While Bulgaria's official reports to Eurostat claim that a higher-than average EU recycling rate for plastic packaging waste is achieved, data from 2019 show that the reuse and recycling rate for municipal waste is below 10% in half of the country's municipalities. Some regional cities and popular tourist areas even lack a functioning separate waste collection system.

The natural conclusion is that a significant portion of plastic packaging waste is not being collected separately, but is discarded with mixed municipal waste. Thus, the responsibility for its final treatment (either incineration, or landfill) is passed on to the municipalities, which are not only financially constrained, but also fail to adopt optimal, cost-effective waste management methods. There is low efficiency in separating recyclable materials

from mixed municipal waste at the sorting facilities at regional waste management centres, which are operated by associations of neighbouring municipalities – their recovery rates do not typically exceed 10 percent. In some places the waste designated for incineration as refuse-derived fuel (RDF) is of low quality, due to the lack of a well-designed structure for the separate collection of bio-waste, construction waste, and other inert materials.

In the background of all this are the very low regulatory requirements for businesses associated with the generation and management of plastic packaging waste, particularly for packaging waste recovery organisations (PROs). For example, the minimum requirements for the capacity and density of the network of separate waste collection bins in larger cities are very low, compared to the quantities of packaging waste reported by the National Statistical Institute (NSI). In practice, in order to be able to absorb the amount of packaging waste actually being generated - and if the PROs adhered only to the minimum standards - separate collection bins would have to be available in each locality and they would have to be either emptied daily or their number should be increased by 2.5 to 3 times, in order to provide sufficient population coverage and be more convenient for households. These two conditions are a world away from the current situation, where separate waste collection bins are primarily placed in densely populated urban centres, while smaller settlements and remote areas are largely ignored. In most municipalities, separate waste collection bins are serviced far less frequently than bins for mixed municipal waste—contrary to the waste collection guidelines for Bulgaria issued by the Ministry of Environment and Water in 2011[1] and more recent separate collection guidelines from the European Commission in 2020[2].

Waste imports and waste incineration projects are additional complicating factors. This analysis found that - apart from imported RDF for cement plants - Bulgaria has been importing 70,000–100,000 tonnes of plastic waste annually for recycling in recent years. Apparently it is easier and more profitable to feed recycling capacity with imported plastics than to invest in a holistic system for the management of domestically generated plastic waste. Additionally, the growing number of waste incineration projects in Galabovo, Sliven, Bobov Dol, Pavlikeni, Stara Zagora, Devnya, and other places undermines incentives to achieve a higher recycling rate for plastic waste.

While solutions to these identified issues—aligned with economic, social, and environmental priorities—are definitely achievable, proposing alternatives is not the focus of this report. The primary aim here is to highlight

[1] ERS-KOS. 2011. Guide to determining the number and type of containers and equipment required for collection and transportation of recyclables and green waste, pp. 17-18.

[2] Emptying the containers more frequently is considered easier for the end user. Therefore, the collection frequency of recyclables and biowaste should be at least as high as the collection frequency of residual waste to stimulate sorting. A combination of short collection cycles for recyclables (e.g. once or twice a week) and longer cycles for residual waste (e.g. 2 weeks) can optimise collection costs while maximising the incentives to sort at source. p. 50 of European Commission (2020). Guidance for separate collection of municipal waste:
ec.europa.eu/environment/pdf/waste/studies/15.1.%20EC_DGENV_Separate%20Collection_guidance_DEF.pdf

the weaknesses in Bulgaria's plastic packaging waste management system and to trigger an expert and public debate for a thorough reassessment and reform of the existing system.

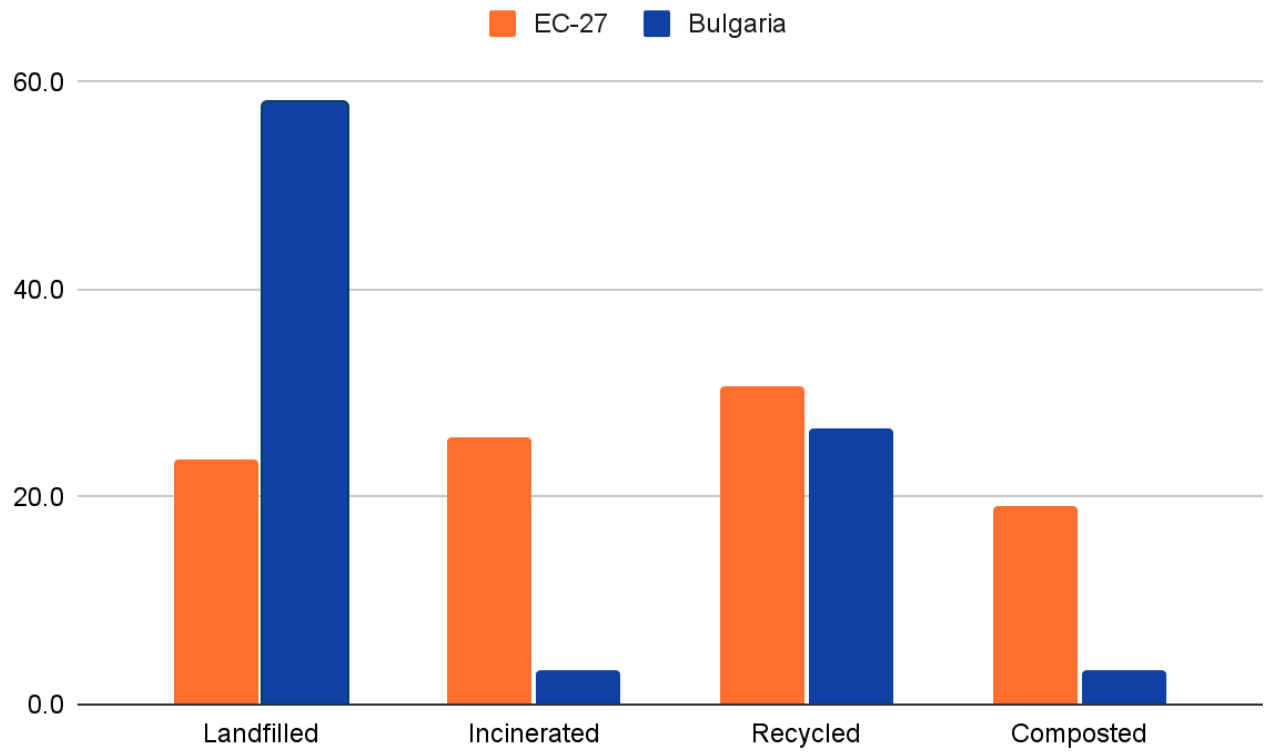
Bulgaria – At the tail end of circular economy

Eurostat data shows that Bulgaria is far from being a "champion" in the European Union when it comes to circular economy. In 2022, the circular material use rate in Bulgaria — meaning the share of materials returned to the economy — stood at 4.8%, compared to the frontrunner, the Netherlands, at 27.5%, and an EU average of 11.5%, placing Bulgaria 20th in the EU[3]. The latest statistics on waste management (covering all sectors except mining), which in the case of Bulgaria dates back to 2018, shows that the country recycles just 22.7% of its waste. This recycling rate is amongst the lowest in the EU and far below the EU average of 55.6 percent recycling[4]. For municipal waste in particular, Bulgaria reports a recycling rate only slightly below the EU average: 26.6% and 30.6% respectively for 2022, the most recent year of data for the country (see Figure 1)[5].

However, the claim to reach the EU average cannot be made, as different calculation methods are used, so the quantitative results of different countries are not directly comparable. Besides that , most member states apply more complex approaches to treating municipal waste. Notably, in 2022, Bulgaria achieved only 3.3% composting of municipal waste — six times lower than the EU-27 average. It is important to clarify that when referring generally to "waste recovery", this includes both material recycling and waste-to-energy through incineration – a controversial practice. Distinguishing between these waste treatment options is crucial, as material recycling is key to resource efficiency, whereas incineration does not align with circular economy principles.

[3] Eurostat. Circular material use rate [SDG_12_41]
ec.europa.eu/eurostat/databrowser/bookmark/7cb32cfc-fd93-448f-a0b9-104a76165474?lang=en
[4] Eurostat. Management of waste excluding major mineral waste, by waste management operations. Last update 19.01.2023.
ec.europa.eu/eurostat/databrowser/view/env_wasoper$defaultview/default/table?lang=en
[5] Own calculations based on Eurostat. Municipal waste by waste management operations. (Recycling – material). Last update 08.02.2024:
ec.europa.eu/eurostat/databrowser/bookmark/304dd3fb-b9e7-4afa-a8ef-f0d202b52700?lang=en

Figure 1. Municipal Waste Management in Bulgaria and the EU in 2022



Source: Eurostat, own calculations. The listed treatment operations cover 99.1% of municipal waste in the EU and 91.2% of the same in Bulgaria.

Against this unfavourable backdrop, statistics on plastic packaging waste recycling in Bulgaria raise serious concerns. In 2019, the packaging recycling rate, which is the metric used to monitor EU policy compliance, was 50.6% for Bulgaria compared to 41.1% for the EU[6] (see Table 1). In absolute terms, 162.9 thousand tonnes of plastic packaging waste were generated in Bulgaria in that year, of which 82.5 thousand tonnes were recycled. According to more recent data from the National Statistical Institute, 148.4 thousand tonnes of plastic packaging were released on the Bulgarian market in 2022, though the amount recycled was not specified.

[6] Eurostat. Recycling rates of packaging waste for monitoring compliance with policy targets, by type of packaging. Last update 25.03.2022.
ec.europa.eu/eurostat/databrowser/product/page/ENV_WASPACR

Table 1: Material recycling percentage for packaging waste in Bulgaria and the EU in 2019

Material	EU-27 Average Recycling (%)	Bulgaria Recycling (%)	EU-27 Ranking (out of 27)
All packaging	64.8	61.2	22
Plastic packaging	41.1	50.6	7
Glass packaging	75.6	61.7	20
Paper/cardboard packaging	82.1	93.9	4
Metal packaging	81.2	75.9	16

Source: Eurostat. Last updated 08/05/2024.

The data above indicates that Bulgaria's waste recovery system, in particular for plastic packaging waste, is in poor shape and what is more, it is not moving in the right direction — a conclusion echoed at high levels. A 2022 European Commission report on the implementation of environmental policies[7] notes that Bulgaria has made "little or no progress" in waste management priority areas as identified in 2019. The report called for "improvements and expansion of separate waste collection," recommending the establishment of minimum standards which include container types, frequency of emptying, and other related measures. Municipal waste recycling rates are considered to be "significantly below the EU average" (32% compared to 46%), and achieving EU recycling targets for municipal and packaging waste will require approximately €16 million in annual investment, totalling €113 million over 2020-2027.

A 2019 report by the World Bank on the effectiveness and efficiency of Bulgaria's waste management spending reached similar conclusions[8], expressing concerns about the quality of statistical data in this area: "The availability and reliability of statistical information limits analysis and could affect findings." World Bank experts for example state that in 2016 the National Statistical Institute reported 1.42 millions tonnes of waste delivered to sorting facilities, whereas the Executive Environmental Agency recorded only 1.15 million tonnes — nearly

[7] European Union. 2019. The Environmental Implementation Review 2012. Country Report – Bulgaria. environment.ec.europa.eu/system/files/2022-09/Bulgaria%20-%20EIR%20Country%20Report%202022%20%28EN%29.PDF
[8] World Bank Team. 2019. Improving the effectiveness and efficiency of waste management costs. Cost Review - Bulgaria. documents1.worldbank.org/curated/en/184551548920986501/pdf/134223-30-1-2019-13-6-33-BGWMJan.pdf

20% less. One of the conclusions of the report is that municipal waste data "should be used with caution." Although data collection and reporting are well-regulated in Bulgarian law, "it seems the [monitoring] system is not functioning correctly."

Finally, public perceptions of the state of the waste management system in Bulgaria are largely negative. A representative survey[9] in Sofia, the capital, found that 71% of respondents were dissatisfied with the city's cleanliness, meaning - the waste collection services, and 55% believed the separate collection system was ineffective, mainly due to the lack of nearby collection containers. Another online study on consumer behaviour among Bulgarians revealed that 69.7% of respondents had their doubts about whether and how much waste from separate collection containers was actually recycled; this is 63% of the respondents in Sofia and almost 80% of the respondents in smaller towns. Only 29% of respondents reported that they always separate their household waste[10] [11]. Additional nuances come from a 2020 survey[12] on the public perception of single-use plastic products, which found that 95% of respondents agreed (72% strongly agreed, 23% somewhat agreed) that measures should be taken to reduce plastic use in Bulgaria to help reduce environmental pollution. Among the measures to reduce plastic pollution, Bulgarians put first the availability of convenient and accessible separate collection containers near all residential buildings.

[9] Vision for Sofia. 2018. Sociological survey on quality of life. December 2018
[10] Sabev, D. (2021) Marketing, consumption and economic growth. "East-West", Sofia, pp. 160-162
[11] Bodil.bg (2019) Revealing the Bulgarian consumer
bodil.bg/2019/10/31/consumer-behaviour/
[12] Za Zemiata - Friends of the Earth Bulgaria. 2020. Key results from a nationally representative survey of public perceptions on the use and reduction of plastic products for single use. Implemented by Marketlinks. January 2020.
www.zazemiata.org/wp-content/uploads/2020/06/200513_BG-Plastic-Poll-Analysis-ZZ-final.pdf

Packaging waste recovery organisations: performance

The activities of Packaging Waste Recovery Organisations (PROs) in Bulgaria are regulated under the Waste Management Act and the Ordinance on Packaging and Packaging Waste[13] [14]. Currently, four PROs[15] operate in the country, and their performance results for 2022, 2020, and 2018 are presented in the three tables below[16].

Table 2: Performance of recovery organisations for 2022

Organisation	Packaging released on the market (tonnes)	Of which recycled (tonnes)	Plastic packaging released on the market (tonnes)	Of which recycled (tonnes)	Plastic packaging recycling rate (%)	Population covered
Ecopack Bulgaria	180,742	117,889	48,733	22,833	46.9	2,496,541
Bulecopack	90,017	65,209	15,785	10,149	64.3	1,315,571
Eco Partners Bulgaria	61,081	42,964	13,334	5,325	39.9	897,182
Ecobulpack Bulgaria	93,917	68,337	27,507	16,592	60.3	1,441,724
Total	425,757	294,399	105,359	54,899	52.1	6,151,018

[13] Waste Management Act;
www.moew.government.bg/static/media/ups/tiny/%D0%A3%D0%9E%D0%9E%D0%9F/%D0%97%D0%B0%D0%BA%D0%BE%D0%BD%D0%BE%D0%B4%D0%B0%D1%82%D0%B5%D0%BB%D1%81%D1%82%D0%B2%D0%BE/ZAKON_za_upravlenie_na_otpadacite%20%281%29.pdf

[14] Ordinance on Packaging and Packaging Waste (OPP)
www.moew.government.bg/static/media/ups/tiny/%D0%A3%D0%9E%D0%9E%D0%9F/%D0%97%D0%B0%D0%BA%D0%BE%D0%BD%D0%BE%D0%B4%D0%B0%D1%82%D0%B5%D0%BB%D1%81%D1%82%D0%B2%D0%BE/%D0%9D%D0%90%D0%A0%D0%95%D0%94%D0%91%D0%98/%D0%9F%D0%9C%D0%A1%202022/NAREDBA_za_opakovkite_i_otpadacite_ot_opakovki.pdf

[15] Ministry of Environment and Waters. List of organisations for packaging waste recovery which hold a permit under Article 81 of the Waste Management Act.

[16] Data for 2019 are summarised in the EEA report pursuant to Article 53 of the Ordinance on Packaging and Packaging Waste
eea.government.bg/bg/nsmos/waste/dokumenti/dokumentiNEW/Doklad_nooo_2019.pdf

Table 3: Performance of recovery organisations for 2020

Organisation	Packaging released on the market (tonnes)	Of which recycled (tonnes)	Plastic packaging released on the market (tonnes)	Of which recycled (tonnes)	Plastic packaging recycling rate (%)	Population covered
Ecopack Bulgaria	153,655	94,683	42,390	17,094	40.32	2,504,263
Bulecopack	48,900	31,009	10,769	4,123	38.28	779,555
Eco Partners Bulgaria	45,306	36,550	11,349	3,168	27.91	671,249
Ecobulpack Bulgaria	96,012	64,348	27,886	15,718	56.36	1,713,075
Ekocollect*	36,466	25,764	5,059	3,044	60.17	584,732
Total	380,339	252,354	97,453	43,147	44.27	6,252,874

*Source: Ministry of Environment and Water[17], own calculations.**

**Organisation was active at the time of data reporting.*

[17] Order No. 386/15.05.2019 of the Minister of the Environment and Waters
www.moew.government.bg/static/media/ups/tiny/filebase/Waste/Opakovki/ZAPOVEDI_RESHENIYA_2019/%D0%97%D0%B0%D0%BF%D0%BE%D0%B2%D0%B5%D0%B4%20%D0%B7%D0%B0%20%D0%B8%D0%B7%D0%BF%D1%8A%D0%BB%D0%BD%D0%B5%D0%BD%D0%B8%D0%B5%20%D0%BD%D0%B0%20%D1%86%D0%B5%D0%BB%D0%B8.pdf

Table 4: Performance of recovery organisations for 2018

Organisation	Packaging released on the market (tonnes)	Of which recycled (tonnes)	Plastic packaging released on the market (tonnes)	Of which recycled (tonnes)	Plastic packaging recycling rate (%)	Population covered
Ecopack Bulgaria	166,371	100,959	43,506	18,004	41.81	2,571,508
Ecobulpack	113,914	81,762	30,236	19,321	63.9	1,905,912
Bulecopack	50,292	34,637	10,653	3,817	35.83	835,105
Ekocollect	43,417	28,490	5,391	2,808	52.08	731,665
Eco Partners Bulgaria	23,577	16,037	5,413	1,534	28.34	625,301
Total	397,571	261,885	95,199	45,484	47.77	6,669,491

Source: Ministry of Environment and Water[18], own calculations.

The comparison of the three tables reveals some interesting trends. In 2020, companies participating in collective schemes under the PROs released on the market (i.e. reported) 17.2 thousand fewer tonnes of packaging waste compared to 2018, a decrease of 4.3%. The share of plastic packaging waste recycling also drastically decreased: from 47.8% to 44.3%; all of this can be explained with the pandemic.

Two years later, the volume of packaging released to the market significantly increased, exceeding 426 thousand tonnes—a 12% increase from 2020 and a 7.3% increase from 2018. The proportion of recycled packaging also improved, reaching 69.1% in 2022 compared to 65.9% in 2018. But despite this observed overall improvement, the share of recycled plastic packaging remains considerably below the average: 52.1%. However, there has been a 4.3 percentage point increase in plastic packaging recycling over four years.

The modest improvement in recycled packaging rates can be attributed to the convergence between the Bulgarian economy and consumer markets with those of the EU. However, a major issue remains the substantial discrepancy between the consolidated data on the PROs' activities and the plastic packaging data

[18] Order No. 386/15.05.2019 of the Minister of the Environment and Waters
www.moew.government.bg/static/media/ups/tiny/filebase/Waste/Opakovki/ZAPOVEDI_RESHENIYA_2019/%D0%97%D0%B0%D0%BF%D0%BE%D0%B2%D0%B5%D0%B4%20%D0%B7%D0%B0%20%D0%B8%D0%B7%D0%BF%D1%8A%D0%BB%D0%BD%D0%B5%D0%BD%D0%B8%D0%B5%20%D0%BD%D0%B0%20%D1%86%D0%B5%D0%BB%D0%B8.pdf

reported by the National Statistical Institute (NSI). According to NSI, 148,367 tonnes of plastic packaging waste were generated in Bulgaria in 2022, while PROs reported only 105,359 tonnes— 30% less. A similar discrepancy (38%) was observed in 2018, while for 2020, the difference reached 78%.

This alarming inconsistency has not escaped the attention of auditors from the Court of Auditors , which noted in a thematic report on plastic waste management (2017-2019): "The total volume of plastic packaging released on the market at the national level, as reported by NSI, is significantly higher than the amount of plastic packaging waste declared by recovery organisations."[19] Unfortunately, the auditors do not delve deeper in their findings, and in the next paragraph conclude instead that "the data shows positive results regarding national recycling and recovery targets for packaging waste." This ambivalence pervades the entire thematic report of the Court of Auditors, which has no difficulties in first stating that the National Waste Information System is not fully established, and then observing that plastic waste public registers provide "publicity and transparency"[20].

The World Bank researchers arrived at similar conclusions and were more direct: "...it appears that the quantities of packaging materials released on the market, as reported to the Ministry of Environment and Waters by PROs, may be lower than the quantities reported as released on the market."[21] The experts estimate a probable discrepancy of about 30 percent.

It should be noted that the volume of plastic packaging released on the market by businesses participating in PROs will always be lower than the total volume of plastic packaging waste reported by NSI[22]. Companies have the choice of either joining collective schemes under PRO or paying a product fee to the state-run Enterprise for Management of Environmental Protection Activities (EMEPA) for the amount of packaging they place on the market. Quarterly data[23] from EMEPA shows that in 2022 product fees for packaged goods amounted to

[19] Court of Auditors. 2021. Audit report on the performed audit "Management of plastic waste" for the period 01.01.2017 to 31.12.2019 (p. 18)
www.bulnao.government.bg/media/documents/OD_otpadaci_0921.pdf
[20] Ibid, p. 19
[21] World Bank team, cited.
[22] In the methodological notes on the reporting of packaging waste quantities NSI states the following: "The packaging assessment is derived from a combination of data from annual sample observation and comprehensive data on the main producers of packaging and packaged goods obtained from the Executive Environmental Agency."
www.nsi.bg/sites/default/files/files/metadata/Ecology_Method_11.pdf
[23] EMEPA, Information on funds received from product fees in accordance with the Ordinance for Determining the Order of Payment and Amount of the Product Fee
pudoos.bg/2024/07/%D0%BD%D0%B0%D1%80%D0%B5%D0%B4%D0%B1%D0%B0-%D0%B7%D0%B0-%D0%BE%D0%BF%D1%80%D0%B5%D0%B4%D0%B5%D0%BB%D1%8F%D0%BD%D0%B5-%D0%BD%D0%B0-%D1%80%D0%B5%D0%B4%D0%B0-%D0%B8-%D1%80%D0%B0%D0%B7%D0%BC%D0%B5%D1%80/

BGN 527,204, which, at a rate of BGN 2.33 per kilogram for plastic packaging[24], corresponds to 226 tonnes of plastic packaging waste, or 0.15% of the market total (according to NSI data).

Part of the packaging waste in large cities is manually sorted and submitted for recycling by informal collectors: according to an expert estimate, in 2017 they handed over to the recycling points almost half of Sofia's recyclable waste, compared to only 10% collected through the official coloured container system[25] [26]. However, informal collectors primarily target metal waste, and their activity has declined in recent years, partly because collection points have relocated to industrial areas, making them harder to access.

Regardless, the 43,000-tonne discrepancy between the plastic packaging waste released to the market in 2022 (148.4 thousand tonnes according to NSI and 105.4 thousand tonnes reported by PROs) is significant, suggesting at the very least that there is a serious problem with waste flow reporting in Bulgaria. In 2020, the discrepancy was even greater, reaching 75,000 tonnes.

It is essential to investigate whether members of the collective schemes accurately report the actual amounts of packaging they release on the market. Besides the conclusion that PROs fail to report transparent and accurate data on separate collection and recycling, it is also crucial to explore the reasons for the contradiction between the successes reported to Eurostat concerning packaging recycling while at the same time the Executive Environmental Agency reports exceptionally low municipal solid waste recycling rates achieved by Bulgarian municipalities (see Table 6).

[24] Annex 3 to Art. 1(3) of the Ordinance on the determination of the procedure and amount for payment of product fees, enforced from 16.06.2016
www.moew.government.bg/static/media/ups/tiny/%D0%A3%D0%9E%D0%9E%D0%9F/%D0%97%D0%B0%D0%BA%D0%BE%D0%BD%D0%BE%D0%B4%D0%B0%D1%82%D0%B5%D0%BB%D1%81%D1%82%D0%B2%D0%BE/%D0%9D%D0%90%D0%A0%D0%95%D0%94%D0%91%D0%98/NORRZPT.pdf

[25] Bosilena Melteva. "There are about 4-5 thousand homeless people collecting waste in Sofia". *Dnevnik*, 14.06.2018
www.dnevnik.bg/zelen/2018/06/14/3199994_okolo_4-5_hiliadi_dushi_se_zanimavat_redovno_s/%D0%94%D0%B5%D0%BA%D0%BB%D0%B0%D1%80%D0%B0%D1%86%D0%B8%D1%8F%20%D0%B7%D0%B0%20%D0%BF%D0%BE/

[26] Za Zemiata - Friends of the Earth Bulgaria 2017. Invisible Hands: an initial assessment of the scale of the informal sector for of secondary raw materials collection in Sofia
www.zazemiata.org/wp-content/uploads/2018/11/171116_Ocenka_Wastepickers_Sofia_final-format.pdf

Financial aspects of packaging waste recovery organisations' activities

The quantities reported as released to the market and the waste actually recovered are not the only factors by which the activities of the PROs (Packaging Waste Recovery Organisations) should be assessed. Table 5 below presents the financial results of the four recovery organisations in 2022.

Table 5: Financial Results of PROs for 2022

Organisation	Revenue (thousand BGN)	Profit (thousand BGN)	Population covered	Personnel costs (thousand BGN)	External services costs (thousand BGN)	Tax expenses (thousand BGN)
Ecopack Bulgaria AD	32,766	-547	2,496,541	1,306	26,573	-56
Bulecopack AD	15,039	80	1,315,571	1,139	8,077	17
Eco Partners Bulgaria AD	7,877	1,910	897,182	590	3,120	212
Ecobulpack Bulgaria AD	10,086	27	1,441,724	1,256	9,515	5
Total	**65,768**	**1,470**	**6,151,018**	**4,291**	**47,285**	**178**

Source: Commercial Register (Annual Financial Statements of the Included Organisations), own calculations.

First, it is important to note that the revenues of the PROs - which are primarily derived from fees paid by companies participating in their collective schemes - are in reality costs passed onto consumers. It works similarly to VAT: the recovery fee is added to the price and paid by the end consumer. Thus, the nearly 66

million BGN in PRO revenues are covered by the average Bulgarian citizen through the purchase of packaged goods.

This is significant because, prior to covering this product fee, the Bulgarian consumer is already financing mixed municipal waste treatment through local waste fees. According to NSI, waste fee revenue in 2022 amounted to 752.1 million BGN, which is over 52% of all local taxes and fees. It should also be noted that in only four years - since 2018 - waste fees have increased by 38.5%, or nearly 210 million BGN.

As seen in Tables 2, 3, and 4 (column 4 minus column 5), there is a difference of over 50 thousand tonnes between the packaging released on the market and the recycled plastic packaging, according to the PROs' reports. It is likely that this considerable quantity ends up in mixed municipal waste. For packaging that was not collected separately and was disposed of with mixed waste, consumers essentially pay twice—once through the product fee included in the price of the packaged product, and again through the municipal waste fee. Whether it is fair for people to pay twice for the management of the same waste is an issue that has been raised multiple times[27]. Meanwhile, PROs receive a regulated income for releasing at least 50 thousand tonnes of packaging on the market annually without ensuring its recycling. PROs often selectively sort the materials that have the highest market value, leaving local budgets to cover the costs of the treatment of (incinerating or landfilling) undesirable packaging waste, technically recyclable but commercially unprofitable materials, and other non-recyclable packaging waste[28].

The above remarks do not exhaust the criticism on the principles of structuring PRO activities in Bulgaria. As shown in Table 5, the main expenses of PROs — 72% of total expenses in 2022 — are for external services. PROs primarily are administrative structures that own certain assets (sorting sites, separate collection containers, etc.) but outsource core activities to subcontractors. For this mainly organisational work (some PROs employ only highly educated staff), personnel costs amounted to 4.3 million BGN in 2022 — funded by end consumers. It is unclear how much these amounts have truly contributed to waste management and whether the optimisation of activities, rather than competing private schemes, could have reduced these expenses.

However, the real problem with PRO expenses might be actually on the contrary: that these costs are actually lower considering the task set for them by the Waste Management Act — to serve as the "backbone" of separate collection and subsequent recycling activities for municipal waste in the country. Annual reports from some PROs reveal that members of the collective schemes are highly sensitive to the cost of the recovery of

[27] Iva Dimitrova. "Expensive packaging. Bulgarians pay more than other Europeans for waste management, while getting unsatisfactory recycling results". Economic Life, 13.10.2021.
ikj.bg/glasove-mneniya/skapi-opakovki/

[28] 9 "The cost of waste that is not recyclable, according to the contracts and of course in consultation with the Ministry of Environment and Waters, waste which is not recyclable shall be disposed by the municipality.", Minutes from the Public consultation on the draft "Waste Management Programme of Sofia Municipality for the period 2021-2028", 06.07.2023, p. 5.
www.sofia.bg/documents/d/guest/2023-07-06-protokol-obsestveno-obs-zdane-puo

the packaging waste they release to the market. For instance, in 2020, Ecopack Bulgaria, the largest PRO on the market, noted[29] a net decrease of 39 member companies who opted for other collective schemes offering lower prices. This reduction corresponds to 3.4% of its membership and represents around 5,000 tonnes of packaging waste.

Economic logic suggests that pressure from companies for increasingly lower prices on waste recovery services prevents PROs from actively engaging in sustainable solutions for packaging waste recovery in Bulgaria. Since the regulatory recycling requirements for plastic packaging have until recently been low (up to 2021, the requirement was only 22.5% for plastic packaging[30]), PROs easily exceeded these targets without the need of coming up with holistic solutions for recycling issues.

In this context, the product fee that companies must pay to the state EMEPA if they choose not to join a PRO has been set at 2.33 BGN per kilogram of plastic packaging for over ten years. At this rate, given the quantities reported by PROs, their services should theoretically cost 245 million BGN, nearly four times the total revenue of PROs for the year. In theory, PROs are expected to achieve higher efficiency than the state entity[31], resulting in lower costs for companies in their schemes. However, the significant price discrepancy between public and private schemes—combined with the large disparity between NSI data on plastic packaging and the amounts reported by the companies themselves—suggests that at the moment, efficiency may not be the sector's primary principle.

Another point worth considering is that PROs typically outsource collection and recovery activities to affiliated companies, potentially meaning that external service expenses are redirected back to themselves. While integration is a proven business approach, implementing it in a sensitive sector like waste management raises questions about cost efficiency and the purity of material flows. The most innocent remark here is the apparent tax optimization by some PROs, with consistent annual accounting losses and minimal tax expenses across the organisations studied.

[29] Ecopack Bulgaria. Annual report 2020. Source: Commercial register. portal.registryagency.bg/CR/en/Reports/ActiveConditionTabResult?uic=131210347

[30] Based on OPPW, Article 9 (1) 2 - d

[31] But see Mazzucato, M. 2018. The Value of Everything. The famous economist proves, that in providing important public services, private companies may be less efficient and more costly than public ones.

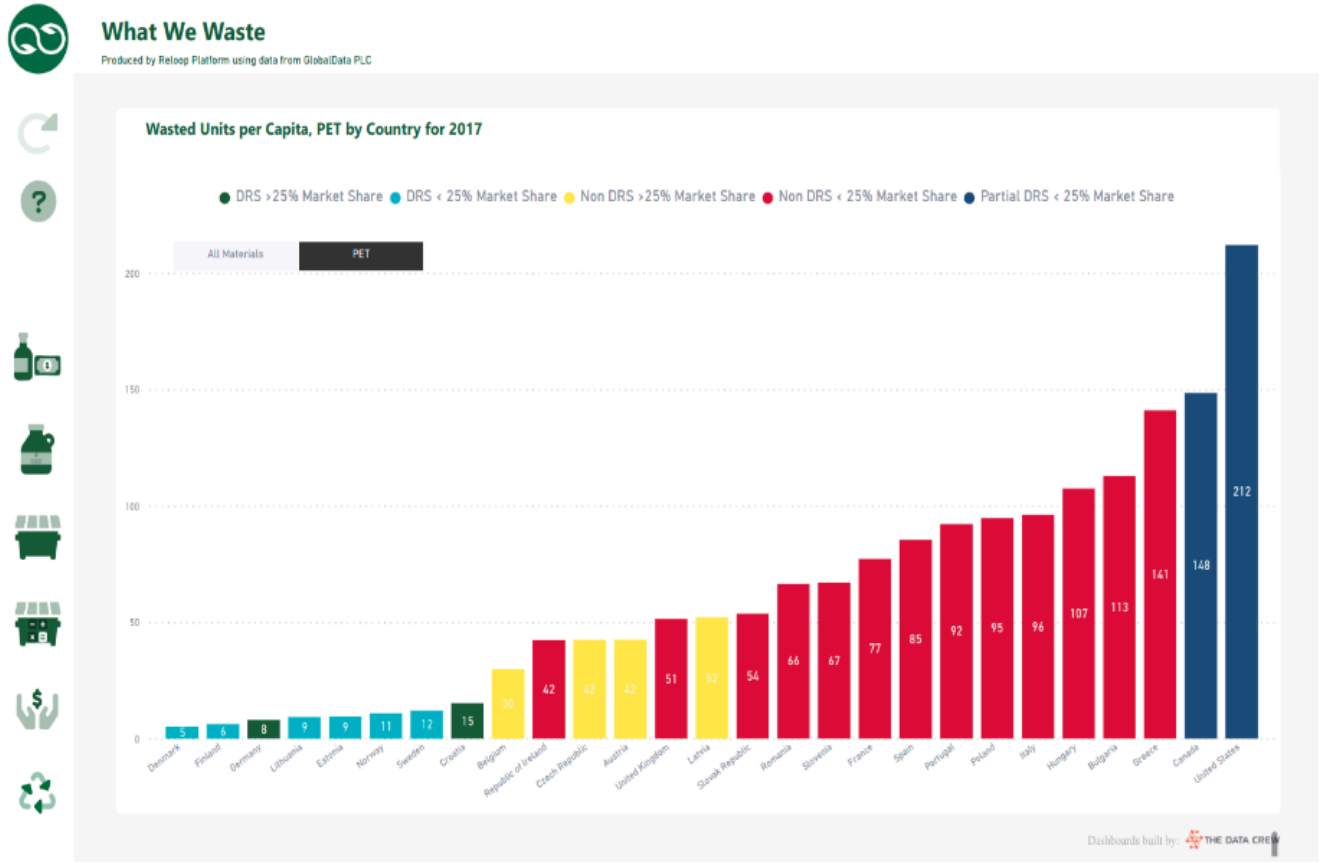
Low legal requirements for the separate collection of packaging waste

As previously noted, the low minimum recycling requirements in Bulgaria, which were in effect until 2021, were easily exceeded by the PROs. Even the new, significantly higher recycling targets for plastic packaging waste, which were introduced under Directive (EU) 2018/852, do not require urgent investments in separate collection or recovery systems, particularly given the current quality of statistical data. In 2018, two of the five PROs operating at the time in Bulgaria officially reported over 50% recycling of plastic waste, with the five organisations achieving an average recycling rate of nearly 48 percent. For comparison, under the latest amendment to the Ordinance on Packaging and Packaging Waste in 2021, the requirement to recycle 50% of plastic packaging waste must be achieved by the end of 2025.

The highest target — 55% recycling of plastic packaging waste — must be achieved by 2030. Reports from the Ministry of Environment and Waters (MOEW) indicate that as early as 2018, one PRO was already exceeding the minimum targets set for the coming decade. While these targets themselves are not inherently "low," they practically become low due to ambiguities surrounding the reported and actual material flows of waste in Bulgaria.

In this context, it is worth mentioning that Bulgaria is among the countries where the highest number of plastic bottles per capita are wasted (see Figure 2). How is it possible that Bulgarian PROs achieve this high percentage of separate collection and recycling that they report? In Bulgaria, in 2017, an average of 113 plastic bottles per capita were “wasted” (landfilled, incinerated, or simply littered). In comparison, similar figures for other countries are: 95 in Poland, 54 in Slovakia, and 42 in the Czech Republic—but only 9 in Lithuania and Estonia, where deposit-return systems are in place.

Figure 2. In 2017, Bulgaria has "wasted" 113 plastic bottles per capita



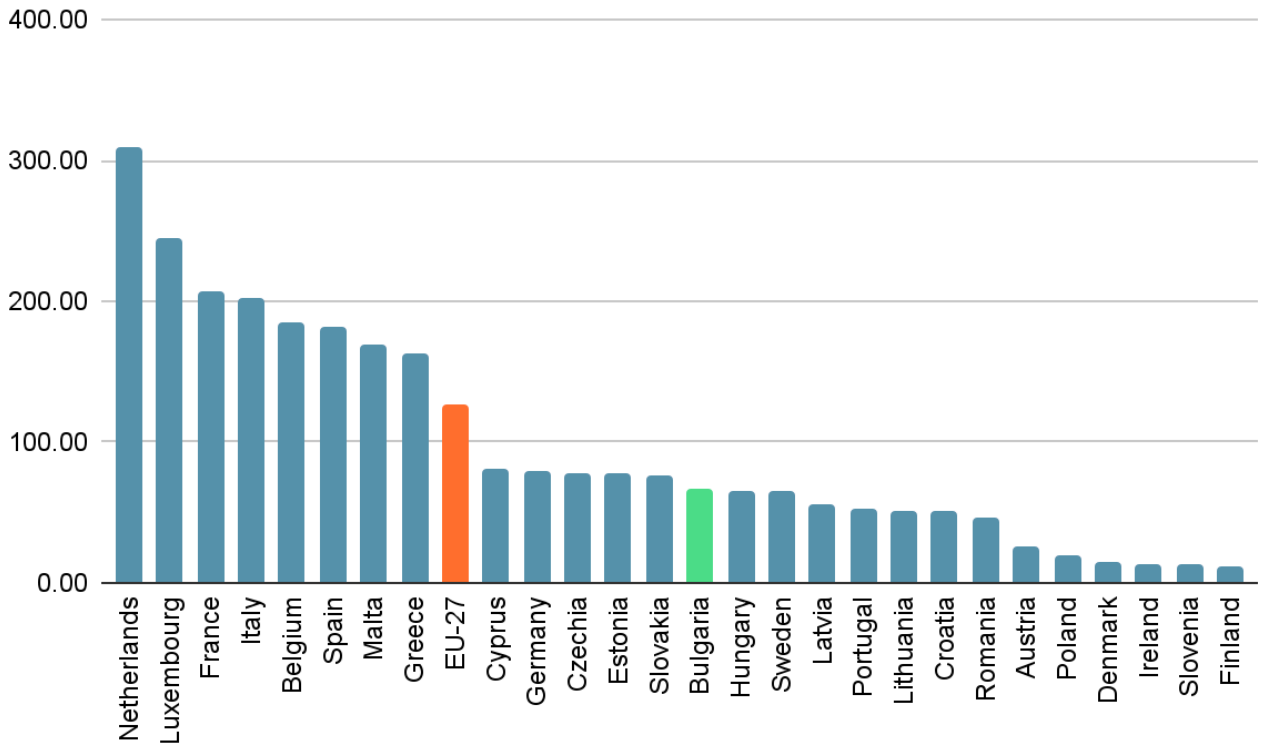
Source: Reloop.[32]

Moreover, despite the favourable assessment of PROs by Bulgarian institutions, Bulgaria has been incurring an annual obligation of 44 million BGN since 2021 due to the new EU tax on 53.6 thousand tonnes of unrecycled plastic packaging[33] [34] [35]. This tax is intended to incentivise a halt to the systematic loss of recyclable materials from the economy and adds to Bulgaria's already relatively high (as a share) public spending on waste management. In 2022, Bulgaria allocated 435.6 million euros to waste management, accounting for 1.2% of total public expenditure, compared to 0.7% for the EU[36] (see Figure 3). Waste management costs per capita in

[32] According to a report by the platform Reloop, based on GlobalData PLC data
www.reloopplatform.org/what-we-waste/what-we-waste-dashboard/
[33] See the position of Environmental Association "Za Zemiata – Friends of the Earth Bulgaria" ;
www.zazemiata.org/resources/evropejski-danak-plastmasa
[34] Investor.bg. "Environmental Expert: 50 thousand tonnes of plastic remain excluded from the recycling process". 7 December 2023.
www.investor.bg/a/462-bulgaria-on-air/385678-ekoekspert-50-hil-tona-plastmasa-ostava-izvan-protsesa-na-retsiklirane
[35] 3e-news. "Bulgaria will pay tens of millions of euros annually in plastic tax."
https://3e-news.net/bg/a/view/21739/bylgarija-shte-plashta-desetki-milioni-evro-godishno-danyk-plastmasa
[36] Eurostat. General government expenditure by function: Waste management. Last updated 22.04.2024.
ec.europa.eu/eurostat/databrowser/bookmark/df43e4fd-635d-4a99-b97f-37ea35a16bc8?lang=enhttps://ec.europa.eu/eurostat/databrowser/bookmark/df43e4fd-635d-4a99-b97f-37ea35a16bc8?lang=en

Bulgaria actually exceed the average in 13 European countries, including some older EU member states such as Sweden and Austria, and are only 17% lower than those in Germany. Meanwhile, these costs are 4.5 to 6 times higher than those in Denmark, Ireland, Slovenia, and Finland.

Figure 3. Public expenditure on waste management in the EU in 2022 (Euros per capita)



Source: Eurostat, own calculations

The mandatory requirements for separate collection that PROs are obliged to provide in populated areas, e.g. the volume of the containers for separate collection and the population covered by separate collection systems, do not seem to provide sufficiently convenient access for all residents. Currently, the network established by the PROs covers areas where around 90% of the country's population lives, encompassing 78% of Bulgaria's 265 municipalities. Nevertheless, nearly five thousand villages and a number of small towns remain practically outside the system's reach. Even the latest National Waste Management Plan until 2028 states that "the waste containers for separate collection are almost entirely owned by recovery organisations, and sufficient information for analysis regarding their number and volume is currently lacking."[37] According to the Ordinance on Packaging and Packaging Waste, PROs must provide separate collection containers with a

[37] National Waste Management Plan 2021 - 2028, p. 335
www.moew.government.bg/static/media/ups/tiny/%D0%A3%D0%9E%D0%9E%D0%9F/%D0%9D%D0%9F%D0%A3%D0%9E-2021-2028/1.9.%20Infrastructura%2008%2006%202021.pdf

minimum total volume of 3,300 litres for every 750 residents in cities with populations over 100,000 — equivalent to three of the commonly used colour-coded "igloo" containers. This minimum threshold means that in Bulgaria's larger cities, only 4.4 litres of separate collection capacity per resident are guaranteed — in the capital, this is the available weekly capacity, while in other areas, it stretches to two or more weeks. This capacity could be visualised as four tightly placed milk cartons per resident.

Such a limited volume cannot accommodate much waste: even if bins are emptied daily, these 4.4 litres per resident are insufficient for the average resident of the capital, who generates 5.3 litres of paper, cardboard, plastic, metal, and glass waste daily.[38]

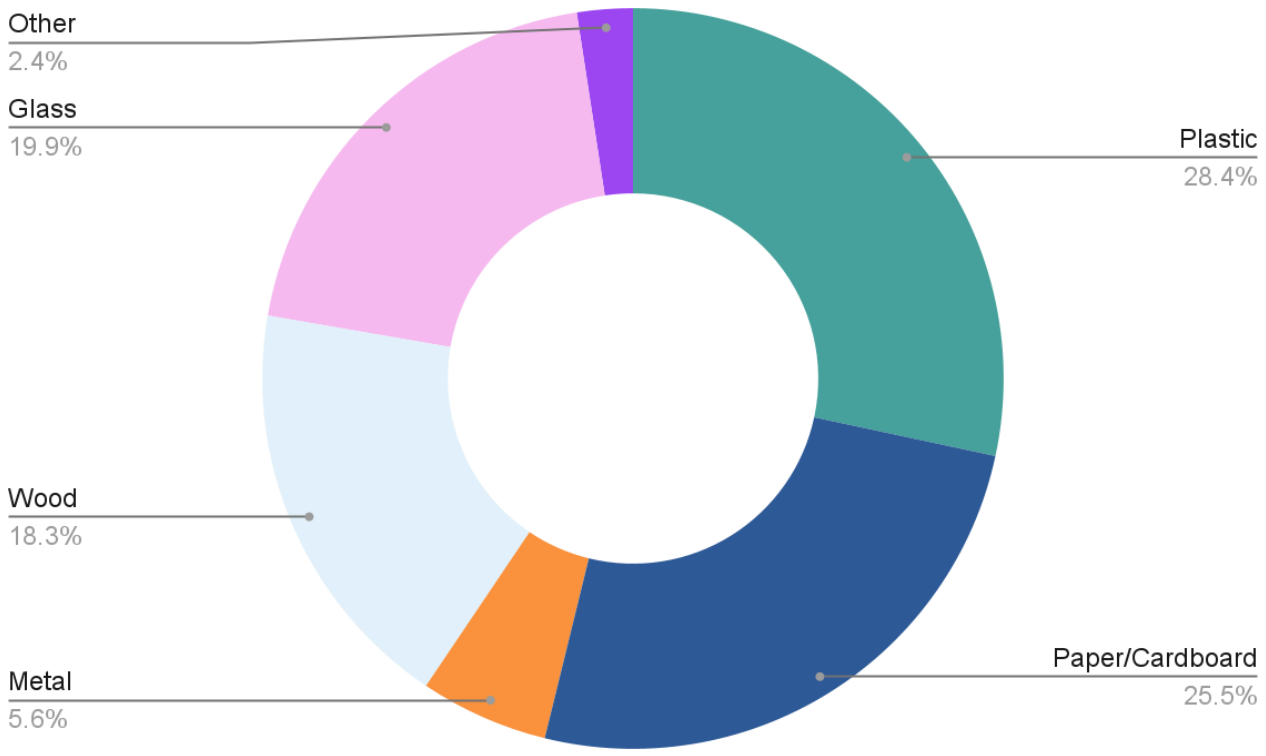
These minimum requirements can be viewed from another perspective: according to NSI, over 523 thousand tonnes of packaging waste were produced in Bulgaria in 2022[39] (see Figure 4), corresponding to a daily average of 3.7 litres of the capacity of packaging waste needed per resident[40]. If all this waste were deposited separately in PRO containers, according to the highest minimum requirements for container capacity, the colour-coded packaging waste containers would need to be emptied daily or would have to be three times as numerous — assuming all residents have access to them, which is far from the current situation.

[38] Own calculations with data from EPC-Kos. 2011 and "MORPHOLOGIA SOFIA" DZZD 2015. Final report on the implementation of the public procurement with the subject: "Morphological analysis of the composition and quantity of municipal waste generated on the territory of Sofia Municipality".

[39] According to the NSI methodology, "the amount of packaging produced is a measure of the amount of waste generated." This figure includes not only consumer (primary) packaging but also bulk and transport packaging (excluding containers). Total municipal waste sent for recycling in 2022 amounts to 375 thousand tonnes.
www.nsi.bg/sites/default/files/files/metadata/Ecology_Method_11.pdf

[40] Own calculations based on sources EPC-Kos. 2011, "MORPHOLOGIA SOFIA" DZZD 2015 and NSI 2022, assuming that one cubic meter of packaging waste weighs about 60 kilograms (so-called bulk weight or density of materials).

Figure 4. Packaging waste generated in Bulgaria in 2022



Source: NSI

Of course not all packaging waste is generated by households, and PROs do provide slightly more containers than the minimum requirement. Aggregate data for the four PROs in 2022 indicates that the total container capacity is 55.5 million litres. However, these minimum legal requirements that neither match actual generated waste quantities, nor align with citizens' habits, nor do they even attempt to shift these habits toward a circular economy, can be considered inadequate.

In summary, the regulatory documents outlining waste management in Bulgaria showcase the obvious intention not to burden economic entities with obligations to improve – not only in terms of recycling but also higher up the waste hierarchy – reuse, reduction, and prevention. Consequently, the financial burden of the system's deficiencies is borne by local taxpayers, and increasing amounts of public funds are being spent on managing plastic packaging waste.

Even lower achievements at the municipal level

We can deepen the analysis by noting that hidden behind the acceptable (albeit questionable) data for packaging waste management on the national level, the separate waste collection system in many regions in Bulgaria is practically not functional. Consequently, recycling rates in dozens of municipalities are either zero or extremely low. This is starkly apparent in the Executive Environmental Agency's assessment of the implementation of the legal requirements that by 1 January 2020 at the latest, municipalities should have ensured the "preparation for reuse and recycling of waste materials, including paper, cardboard, metal, plastic, and glass from households and similar waste from other sources, to at least 50% of the total weight of these wastes."[41]

According to data from the Executive Environmental Agency for 2018, only 33 of Bulgaria's 265 municipalities achieved this recycling level[42]. This includes the three largest Bulgarian municipalities — Sofia, Plovdiv, and Varna — where the larger scale allows for more efficient waste management[43]. But if we see the other list[44] - the one showing municipalities which have not fulfilled the requirements under the WMA, the reality is completely different: in 43 municipalities, the recycling rate was recorded at 0%, and in 145 municipalities, it was measured in one-digit numbers.

For 2019, the latest year with municipal-level recycling data, the situation remained similar[45]: in 132 municipalities, the recycling rate for municipal waste was below 10%. And if for remote small mountain municipalities some excuse can still be found, in medium-sized municipal centres and popular tourist destinations the low recycling rate is obviously a matter of mostly poor organisation - even more unacceptable against the background of significant European funding for the waste sector in recent years. Larger municipalities like Asenovgrad, Belogradchik, Kyustendil, Petrich, Primorsko, Razlog, Samokov, Sandanski, Sozopol, Teteven, and Tutrakan reported recycling rates below 10% in 2019.

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[41] 40 art. 31 (1) 1, in conjunction with § 15 of the Transitional and Final Provisions of the Waste Management Act

[42] Order 139/15.06.2020 of the Executive Environmental Agency. www.moew.government.bg/static/media/ups/tiny/%D0%A3%D0%9E%D0%9E%D0%9F/%D0%A6%D0%B5%D0%BB%D0%B8-%D0%B1%D0%B8%D0%BE/%D0%B7%D0%B0%D0%BF%D0%BE%D0%B2%D0%B5%D0%B4138.pdf

[43] On the other hand, according to the World Bank study, the cost of collecting and transport per tonne of waste collected is twice as high in large municipalities, than in the smallest municipalities (BGN 122.7/tonne compared to BGN 61.6/tonne), which opens up a new series of questions.

[44] Order 139/15.06.2020 of the Executive Environmental Agency. www.moew.government.bg/static/media/ups/tiny/%D0%A3%D0%9E%D0%9E%D0%9F/%D0%A6%D0%B5%D0%BB%D0%B8-%D0%B1%D0%B8%D0%BE/%D0%B7%D0%B0%D0%BF%D0%BE%D0%B2%D0%B5%D0%B4138.pdf

[45] eea.government.bg/bg/nsmos/waste/dokumenti/obshini_2019_15.03.22.pdf

The situation is similarly bleak in regional capitals , as summarised in Table 6.

Table 6. Rates of preparation for reuse and recycling in regional urban centres in 2019

Municipality	Municipal Waste Prepared for Reuse and Recycling (tonnes)	Landfilled Biodegradable Waste (tonnes)	Rate of Preparation for Reuse and Recycling (%)	Achieved level of limiting of the quantity of biodegradable municipal waste landfilled (%)
Blagoevgrad	3,941	21,226	16	54
Burgas	17,249	54,858	24	55
Varna	103,846	21,468	61	90
Veliko Tarnovo	22,967	9,054	67	81
Vidin	7,218	19,233	29	67
Vratsa	2,694	14,952	15	77
Gabrovo	12,730	19,367	51	53
Dobrich	23,328	17,056	62	77
Kardzhali	2,845	21,287	12	49
Kyustendil	1,297	0	8	
Lovech	3,732	13,252	24	61
Montana	3,527	18,452	17	96
Pazardzhik	10,266	48,256	18	0
Pernik	28,480	38,146	53	38
Pleven	38,856	37,744	48	51
Plovdiv	119,187	67,936	65	42

Razgrad	10,322	29,896	31	50
Ruse	17,304	58,332	24	66
Silistra	2,347	23,018	10	65
Sliven	20,481	33,793	41	59
Smolyan	6,085	7,125	34	58
Stara Zagora	30,552	31,414	45	66
Sofia (Capital)	414,140	53,834	65	81
Targovishte	7,309	10,704	39	82
Haskovo	6,241	19,090	21	64
Shumen	24,765	21,764	55	73
Yambol	13,498	19,347	42	62

Source: Executive Environmental Agency

From the data presented in Table 6 (column 4), it is clear that in two-thirds of the regional centres the achieved rate of preparation for reuse and recycling did not reach the required 50% — just one year before the target deadline. Excluding the three largest cities, the average rate in other regional centres likely stands around 35 percent.

The absence of more recent municipal-level recycling data, with the latest figures being from 2019, is telling. It cannot be claimed that substantial improvement appears to have occurred since then. An order from the Director of the Executive Environmental Agency in January 2024[46] reveals that "only 35% of municipalities have conducted a new composition analysis (of municipal waste) between 2019 and 2023," and the data on municipal waste composition are generally inconsistent or missing. Against this backdrop, achieving the target of at least 55% recycling or reuse of municipal waste by 2025, as well as reducing landfilled waste to less than 10% by 2035, seems unrealistic.

[46] Executive Environment Agency (EEA) Order: 5
eea.government.bg/bg/nsmos/waste/waste_legislation/Zapoved_03_090124_.pdf

Given this data, it is fair to question whether Bulgaria's waste management system actually operates in two parallel realities: one in the reports submitted to the European Union, where as of the latest 2019 data[47], Bulgaria claimed a 61.4% recovery rate for packaging waste[48], and an altogether different reality that exists in the operational local data, where half of Bulgarian municipalities fail to achieve even 10% recycling for plastics, metals, paper, and glass.

Another crucial issue lies in the conflicting interests between the waste recovery organisations and the mayors of smaller municipalities. In smaller and remote areas, establishing a comprehensive separate collection system is more complicated and costly and naturally, PROs tend to avoid these areas or fail to provide enough containers to meet actual needs. On the other hand, the population in these areas is also often insufficiently informed or motivated to participate in separate collection (e.g., through a waste fee based on the amount of unsorted waste). Thus, the collection and management of recyclable packaging waste, particularly plastic packaging, falls on local budgets—and this burdens the municipalities that are least able to afford it. This situation is further exacerbated by networks of mutual dependence between local authorities and economic interests in the waste sector, which compromise municipal performance even further.

The highlighted shortcomings do not suggest that there is no progress made in municipal waste management in recent years. According to NSI, in 2020, nearly 64% of municipal waste was subjected to pre-treatment (sorting) at Regional Waste Management Centres, 23.5% was directly landfilled, and 11.9% of municipal waste was separately collected for recycling. In 2015, these rates were 33%, 62%, and 5%, respectively. While progress is undeniable, it should prompt greater ambitions—for instance, addressing the low efficiency (3-5%)[49] of sorting facilities at the Regional Waste Management Centres. Furthermore, given the unsatisfactory quality of waste management data, any achievements - if these are existent - are met with a degree of scepticism.

[47] Eurostat. 2022. Packaging waste statistics. Data for 2019
ec.europa.eu/eurostat/databrowser/bookmark/c437a0f5-e5d3-4936-b441-6c762aaa3c4e?lang=en

[48] In this respect, one can also consider the Court of Auditors' finding in the thematic report of 2021: "The high relative share of compliance with regulatory requirements of local authorities to have waste management programmes in place gives confidence of effective local management policy in the waste sector" (cited, p. 56). This hope is generated by the finding that only 8 municipalities have not published waste management programmes on their website. What these programmes contain and how are implemented - these are questions that the Court does not ask.

[49] World Bank team. 2019.

Issues with waste import and incineration in Bulgaria

Despite being known as the "poorest country in the European Union", surveys indicate that the majority of Bulgarians are unwilling to compromise the environment for possible financial gains[50]. This sentiment is also present when it comes to waste imports—a topic that captured public attention in Bulgaria just before the COVID-19 pandemic[51]. Eurostat data on waste flows[52] between countries reveals that Bulgaria imported over 147,000 tonnes of notifiable waste[53] in 2021, including 79,000 tonnes of hazardous waste. In total, with non-notifiable waste included, according to most recent data around 520,000 tonnes were imported in 2023. This means that in that year, each Bulgarian citizen - the children and the elderly included - has received an "extra gift" of 80 kilograms of imported waste, in addition to the waste they generated; this includes 12 kilograms of hazardous waste.

Cement plants, the primary importers of waste in the form of refuse-derived fuel (RDF), argue that they need imports because the RDF produced in Bulgaria is of insufficient calorific value for the requirements of their technological processes[54]. The industry claims that importing high-calorific RDF allows blending with the low-calorific Bulgarian RDF and in this way, hundreds of thousands of tonnes of RDF from sorted municipal waste in many Bulgarian municipalities can be recovered[55].

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[50] Gallup International. 2016. "Automatic support for any Black Sea conservation measures". 20.06.2016. www.gallup-international.bg/34716/polling-on-environmental-issues-and-hypotheses/

[51] BNT. "Waste - environmental problem or resource". Referendum, 28.01.2020. According to 67% of of the participants in the national TV poll, the problem of unregulated imports of waste should be solved by a complete ban on waste imports bnt.bg/bg/a/otpadtsite-ekologichen-problem-ili-resurs?v=232405

[52] Eurostat. Transboundary shipments of notified waste by partner, hazardousness and waste management operations. Last update 01.02.2022. ec.europa.eu/eurostat/databrowser/view/env_wasship$defaultview/bookmark/table?lang=en&bookmarkId=ed59a753-6135-4dff-8f54-a57d5a66e640

[53] According to EU waste legislation regarding the transportation of waste - for hazardous waste and waste destined for disposal, the usual procedure is to apply for prior notification and consent ('notification'), which requires prior written consent from all relevant authorities of dispatch, transit and destination. environment.ec.europa.eu/topics/waste-and-recycling/waste-shipments_en

[54] Bulgarian Cement Industry Association. Open letter in relation to declared intentions of the MOEW to stop waste imports. 17.06.2021. bacibg.org/o%D1%82%D0%B2%D0%BE%D1%80%D0%B5%D0%BD%D0%BE-%D0%BF%D0%B8%D1%81%D0%BC%D0%BE-%D0%B2%D1%8A%D0%B2-%D0%B2%D1%80%D1%8A%D0%B7%D0%BA%D0%B0-%D1%81-%D0%B4%D0%B5%D0%BA%D0%BB%D0%B0%D1%80%D0%B8%D1%80%D0%B0%D0%BD

[55] Ibid.

RDF generally contains about 30-40% plastic[56]. In theory, this plastic should be non-recyclable, so RDF production should not undermine national and municipal recycling efforts under Directive 2018/851. However, due to the high proportion of plastics in mixed municipal waste (according to waste composition analyses by various municipalities, cited by the Court of Auditors, this makes up about 10-15% of the total weight of municipal waste) and the low efficiency of sorting facilities, recyclable plastics inevitably end up in Bulgarian RDF. This increases the fuel's caloric value, creating a significant financial incentive to meet only minimal plastic packaging recycling targets.

But waste incineration projects have seen increased interest even beyond cement plants. The most notable case involved an attempt to establish a waste incineration facility in Sofia, halted by a Supreme Administrative Court ruling in May 2024. For nearly a decade, the failed project symbolised Sofia Municipality's vision for "effective waste management". Had it proceeded, it would have been the last such facility in the EU[57]. The investment, ironically planned with funds from the European Commission and European Investment Bank, would have rendered the EU goal of 65% municipal waste recycling by 2035[58] unattainable.

This case highlights the conclusion that large waste incineration projects, whether publicly or privately funded, inherently conflict with the advancement of recycling and reuse of plastic waste. The same internal motive - to limit recycling in municipalities in order to benefit economically from waste incineration - can be seen in a controversial project near the town of Pavlikeni[59] in Northern Bulgaria, which is also subject to litigation in the Supreme Administrative Court[60]. The Environmental Impact Assessment for this "mega waste plant" summarises data on waste management from 55 Regional Waste Management Centres. The data reveals that planned RDF production volumes - which were then to be incinerated at the plant near Pavlikeni - in almost all municipalities vastly exceed the amounts of municipal waste sent for recycling.

Incineration as a revenue source also attracts interest from district heating and coal power plants, associated with the energy empire of Hristo Kovachki[61]. Outdated facilities like Bobov Dol TPP and Sliven TPP have been incinerating waste for years. In towns like Vratsa, Burgas, Ruse, and Pernik, strong local public opposition—sometimes supported by local authorities—has thwarted plans for waste incineration. If one

[56] Stepien et al. 2018. Termogravimetric and Calorimetric Characteristics of Alternative Fuel in Terms of Its Use in Low-Temperature Pyrolysis. Waste and Biomass Valorization. 10, 1669-1677.
[57] Desislava Stoyanova. "Demonstrators demand cleaner skies as Bulgaria presses on with incinerator". BankWatch, 26.03.2021. bankwatch.org/blog/demonstrators-demand-cleaner-skies-as-bulgaria-presses-on-with-incinerator
[58] Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste (Text with EEA relevance)
eur-lex.europa.eu/eli/dir/2018/851/oj/eng
[59] The Environmental Impact Assessment documentation is available in MOEW's register.
registers.moew.government.bg/ovos/lot/35809
[60] SAC's decision on the construction of a waste incineration plant near Pavlikeni is expected in a month and a half, BTA, 16.09.2024
www.bta.bg/bg/news/743476-do-mesets-i-polovina-se-ochakva-reshenie-na-vas-po-kazusa-s-izgrazhdaneto-na-zav
[61] Greenpeace Bulgaria. 2018. Financial mines: report on questionable financial practices in coal mines.
www.greenpeace.org/bulgaria/publikatsiya/1689/finansovite-mini-doklad

disregards public health impacts and circular economy principles, waste incineration is a lucrative venture: first, waste is a fuel which is still exempt from emission quotas. Second, incineration appears to address the growing limits on landfill use. Third, the service of "waste incineration", especially for imports, is a potential revenue stream. The latter also is linked to the suspicion that alongside the regular import-export of waste, shady and possibly criminal transactions are taking place.

Through European statistics we can see another negative trend related to waste imports in Bulgaria - the large quantities of imported plastics intended for recycling. This trend is “negative” due to the fact that recycling facilities fill their capacities with imported plastics, bypassing the need for an organised national waste separation system. Eurostat data show that in 2022, 107,000 tonnes of plastic waste were imported for recycling, valued at €22.3 million. It should be noted that PRO revenues in Bulgaria in 2022 were a total of BGN 66 mln. So, the cost of plastics import which will be recycled is equivalent to two-thirds of Bulgaria’s investment in separate collection nationwide. Questions arise about whether the generally acceptable reported rate of waste recycling in Bulgaria (see Table 1) is not influenced by the lack of robust state monitoring of waste imports and their subsequent treatment and official reporting.

Recommendation for the improvement of the waste management system

A review of Bulgaria's plastic packaging waste management system reveals that in the first place, there are serious deficiencies in the quality of data collected and summarised. Such contradictory data make it difficult to assess the true state of waste management and propose forward-looking policies. Therefore, this report aims to prompt discussion about the system's shortcomings that could benefit from optimisation, rather than providing specific recommendations.

Some key issues in applying the Extended Producer Responsibility (EPR) principle through PROs in Bulgaria include:

- **Reported Overachievement in Packaging Targets**: The reported exceeded packaging recycling targets by PROs do not contribute in any visible way toward reaching overall municipal waste goals, indicating lack of transparency and easily manipulated data in Bulgaria's waste management reporting.
- **Disproportionate Infrastructure Coverage**: The formal requirement for separate collection coverage is misleading and entails deep imbalances, with collection containers mainly concentrated in city centres in large cities, while residents of outlying areas and smaller towns (even resort localities) are left without the possibility to separate their waste[62].
- **Lack of Incentives for Reuse and Prevention**: The funding structure of PROs, based on the volume of packaging placed on the market, discourages efforts to promote reuse and reduce packaging waste.
- **Publicly Funded Costs**: The costs related to waste packaging—such as cleaning up littered packaging, treating non-recyclable packaging, as well as the 2021 EU tax on non-recycled or non-reused plastic packaging — are borne by the public.
- **Inadequate Data Collection**: Specific data is not collected, such as data on packaging generated from consumer, transport, and business activities; the amount of packaging in mixed municipal waste; the methodology for determining the composition of municipal waste does not include a distinction between packaging and non-packaging for the categories of plastic, metal, glass, paper/cardboard and composite materials; and there are no special statistics on municipal expenditure for cleaning up public areas and contaminated sites.

[62] In violation of Art. 23 para. 1 of the Ordinance on Packaging and Packaging Waste, where separate collection systems 'shall compulsorily include resort localities and all localities with a population of more than 5 000 inhabitants.

Best practices for effective packaging waste management across Europe are well known. A comprehensive analysis of European systems for separate waste collection suggests[63] that success is achieved by combining several approaches:

- **Separation at the source**: Separate collection of glass and paper/cardboard yields better results, while plastic, metals, and composite packaging are often collected together.
- **Door-to-Door Collection**: More frequent collection of packaging waste than mixed waste enhances recycling outcomes.
- **Street Container Density**: Higher container density (containers per km²) leads to higher collection rates while there is no correlation between performance and the volume available in containers for separate collection per a certain number of inhabitants, which is the key criterion in Bulgaria. Container proximity is critical for success[64], with Czechia for example requiring containers within 150 meters of homes[65].
- **"Pay-As-You-Throw" Principle**: The best-performing systems apply waste charges based on the 'Pay-As-You-Throw' principle, thus collecting more clean and highly recyclable packaging, and generating less mixed waste.

Meanwhile, the EU has already developed, and continues developing, new regulatory packages for a sustainable circular economy. Unfortunately, Bulgarian authorities seem slow to adopt these requirements. Accurate data reporting and fair distribution of responsibilities and financial resources among producers, local authorities, and consumers are urgently needed. For Bulgaria to progress higher up the waste management hierarchy, more waste streams must be directed toward reuse and recycling, with an emphasis on prevention.

In beverage packaging, reuse and refilling align better with circular economy principles than recycling. In 2019, refillable bottles held a 22% market share in Bulgaria, equating to around 500 million bottles[66]. Two decades earlier, in 1999, this share was 74%, or 1.4 billion bottles. With 172 refillable bottles per capita, Bulgaria was once a global leader in this sustainable practice. However, this approach has largely been abandoned in favour of single-use plastic bottles — convenient but environmentally damaging.

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Solutions such as introduction of deposit-return systems and incentives for reusable packaging have long proven their effectiveness. Global experience shows that a modern waste management approach requires ambition and system-level thinking. This report has revealed that Bulgaria's waste management problems are addressed piecemeal, "on paper," or only where it is the most convenient or the obvious thing to do. However, the underdeveloped state of Bulgaria's separate collection and recycling system suggests that there are also huge opportunities for improvement and innovation.

Authors: Evgenia Tasheva
Editors: Seán Flynn, Joan Marc Simon, Larissa Copello
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General information: hello@zerowasteeurope.eu
Media: news@zerowasteeurope.eu
Cities-related topics: cities@zerowasteeurope.eu

www.zerowasteeurope.eu
www.missionzeroacademy.eu