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ZERO PLASTIC

STUDY OF PLASTIC WASTE IN REPUBLICA MOLDOVA

2023

"Without a well-designed and tailor-made management Strategy for end-of-life plastics, humans are conducting a singular experiment on a global scale, in which billions of metric tons of material will accumulate across all major terrestrial and aquatic ecosystems on the Planet."

Geyer et al. 2017

CONTENT

Abbreviations

CE	Circular economy
CEAM	Classification of Economic Activities in Moldova
EA	Environment Agency
EPR	Extended Producer Responsibility
GHGs	Greenhouse Gases
HDPE	High density polyethylene
LDPE	Low density polyethylene
MSW	Municipal solid waste
NBS	National Bureau of Statistics
OECD	Organisation for Economic Co-operation and Development
PCR	Post Consumer Recycled
PET	Polyethylene terephthalate
PP	Polypropylene
PS	Polystyrene
PVC	Polyvinyl chloride
SUPs	Single Use Plastic products (SUPs)
SDG	Sustainable Development Goals

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Introduction

The study on plastic waste in the Republic of Moldova is developed within the Project "Plastic Waste in the Circular Economy: Community Solutions", implemented by NGO Verde e Moldova in partnership with NGO Training and Consultancy Center "E-Circular" with the financial support of the Small Grants Program GEF SGP Moldova, implemented by UNDP. This study is the first at national level and includes an extensive analysis of the current situation and priority areas of action to reduce plastic waste pollution, considering the increased vulnerability of the Republic of Moldova to the consequences of plastic pollution.

At least in the last 10 years there has been a steady increase in the quantities of imported plastics and plastic waste generated, most of which (over 90%) being disposed of by landfilling mixed with household garbage. Therefore, in addition to intense environmental pollution, there is also an increased impact on public health, in particular due to single-use products made from a wide range of plastics to which various additives are added.

If out of the total 353 million tons of plastic waste generated in 2021 globally, 29 million tons or only 9% end up being recycled, it is more than obvious that the current waste production, consumption, and management system is non-functional. For this reason, one of the basic objectives of the Study is to demonstrate that recycling is not the only and far from the most efficient solution in the fight against plastic waste at national level.

It is important to identify new solutions, directly based on the principles of the Waste Hierarchy with a focus on Prevention, Reduction and Reuse, which is the cornerstone of EU and national waste policy and legislation.

In carrying out this study, we started from the analysis of the plastics market at national level and respectively the presentation of the research results for key indicators such as: the share of the Export-Import plastic market in the national GDP, quantities of imported and exported plastics by types, producers of plastic products – according to CEAM, including the territorial division and size of the company, number of authorized operators for the management of waste, its territorial distribution, quantities and types of plastic waste generated, collected, recovered and exported. Analysis of these data reveals a wide range of problems for which urgent solutions are needed, some of them formulated in Chapter 3 of the study.

In the context in which plastic waste management has never been a complex research topic at national level and the need to act has never been more present, the results of the Study come at a key moment for improving the plastic waste management system in the Republic of Moldova, which is why the information, collected data and experience of several countries in the field will be the basis for rethinking the current linear development model by gradually transitioning to a circular economy, including for plastics.

Research methodology

The "Plastic Waste Study in the Republic of Moldova" was conducted using a mixed research method structured in 5 stages:

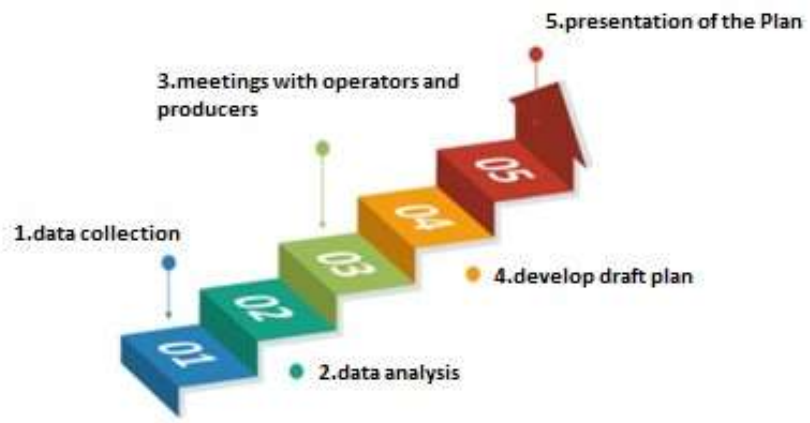


Figure 1. **Steps - the elaboration of the Study**

Stage 1. **DATA collection by telephone contact and questioning of producers of plastic materials / products and authorized operators for plastic waste management.**

The questionnaires developed in Romanian language consisted of a total of 20 questions for each of the target groups and were completed by respondents between August and September 2022. The average time to complete the questionnaire was 15-20 minutes. A total of 18 interviews were conducted (10 - Materials/plastics manufacturers and 8 - Authorised operators)

Step 2: **DATA Analysis**

- Analysis of data requested from NBS (Value of Export-Import Market of Plastics, Producers of plastic products – according to CAEM, etc.);
- Analysis of data requested from the Environment Agency (Authorized operators for collection, transport, treatment, recycling of plastic waste, quantities of exported plastic waste and number of permits issued, etc.);
- Analysis of data requested from the Customs Service (e.g. Quantity of Export-Import Plastics);
- Analysis of data requested from the State Tax Service (eg taxes for environmental pollution from plastics);
- Reports on the state of the environment published by the Environment Agency and IPM.
- Various studies in the field published by national and international organizations (e.g. Break Free From Plastic Pollution, Zero Waste Europe, OECD, etc)

Step 3: **Formal and informal discussions** (field visits) of authorized operators for plastic waste management (e.g. UniPlast SRL, ABS SRL, Salubris Grup SRL AutoVoiaj SRL, etc.) in order to document the organization of the collection and recycling process of plastic waste, recycling capacities, types of waste subject to recycling and technologies used.

Stage 4 and 5: Based on the data analyzed by this study, a series of recommendations grouped by priority areas of intervention were formulated, based on which, as next steps, it is proposed to develop, jointly with the Ministry of Environment, a National Action Plan for reducing plastic pollution and implementing circular economy principles.

Definitions

Reusable packaging	packaging that has been conceived, designed and placed on the market to accomplish, within its life cycle, multiple trips or rotations by being refilled or reused for the same purpose for which it was conceived (minimum rotations of at least 10 to 15 cycles).
Bioplastic	are plastics produced from renewable biomass sources, such as vegetable fats and oils, maize starch, straw, wood chips, sawdust, recycled food waste, etc.
Circular economy	The circular economy is defined as an economic model where resources such as plastic are used more efficiently through the three guiding principles 'reduce, reuse and recycle' to close the loop. Switching to such a system has economic, social and environmental benefits by reducing import dependency, creating jobs, reducing litter, extracting less resources, and improving human health conditions.
Oxo-degradable plastics	plastic materials containing additives which, through oxidation, lead to the fragmentation of the plastics into micro-fragments or to chemical decomposition.
Biodegradable plastic	plastic material that can undergo physical, biological decomposition so that it ultimately decomposes into carbon dioxide (CO2), biomass and water, and is, in accordance with European packaging standards, recoverable through composting and anaerobic digestion.
Macroplastics	plastic particles larger than 5 mm in size.
Microplastics	Very small plastic particles, which are usually smaller than 5 millimetres and appear in the environment as a consequence of plastic pollution. Microplastics are present in a variety of products, from cosmetics to synthetic clothing to plastic bags and bottles. Many of these products easily enter the environment into waste.
Plastic	material consisting of a polymer, to which additives or other substances may have been added, and which may function as the main structural component of final products, except for natural polymers which have not been chemically modified.
Primary (or virgin) plastic	Fossil-based and bio-based plastics can be referred to as primary plastics.
Secondary plastic	plastics made from recycled materials.
Polymer	a substance consisting of molecules characterized by a sequence of one or more types of monomer units. Such molecules must have their molecular weights distributed over such a range that differences in molecular weight are primarily attributed to differences in the number of monomer units.
Single-use plastic product	product that is made wholly or partly of plastic and that is not conceived, designed or placed on the market to accomplish, within its life cycle, multiple trips or rotations by being returned to the manufacturer to be refilled or reused for the same purpose for which it was conceived.
Extended producer responsibility scheme	set of measures taken by Member States to ensure that producers of products bear financial or financial and organisational responsibility for managing the waste stage of a product's life cycle.
Deposit system	system whereby the buyer, when purchasing a product packaged in reusable packaging, pays the seller a sum of money that is reimbursed when the packaging is returned.

Chapter 1. ABOUT PLASTIC AND PLASTIC WASTE

1.1. Global plastics industry

Plastics make a vital contribution to the global economy. Since 1950, the use of plastic products has expanded twenty-fold due to their low cost, properties and diversity of applications for use. At the same time, population growth and higher incomes conditioned global plastics production growth, which has doubled over the past 20 years, from 234 million tonnes (Mt) in 2000 to 460 million tonnes in 2021. Over the same period, growth in plastics volumes exceeded economic growth by almost 40%. While COVID-19 has temporarily reduced this increase, it is likely to return again, albeit with a slight change in trends in waste use and generation.

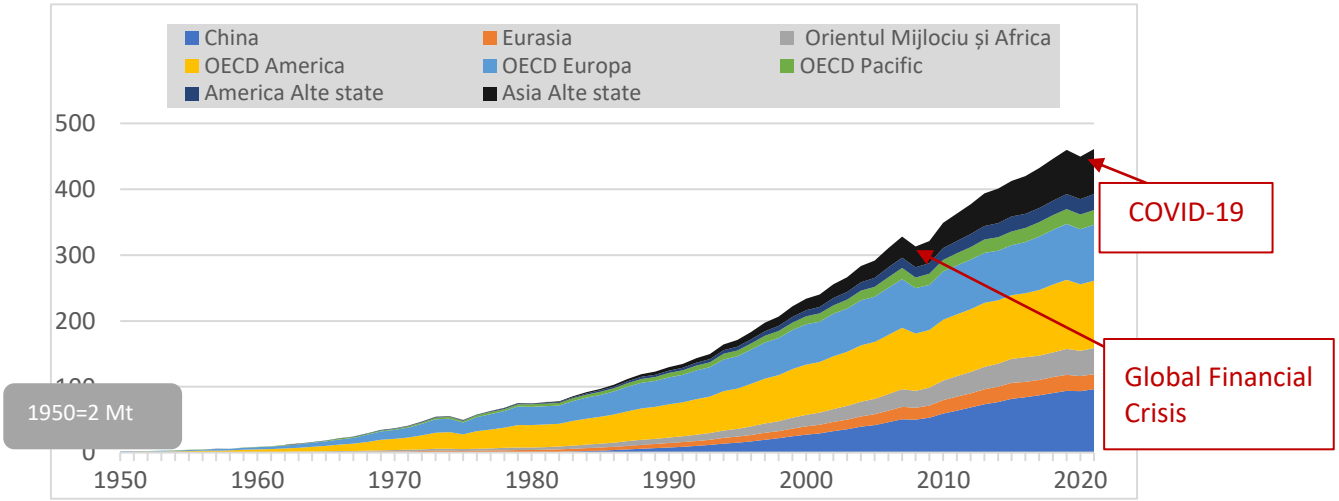


Figure 2. **Plastic production in million metric tons for the period 1950 – 2021**
Source: Global Plastic Outlook 2022

In 2021, global plastics production reached **460 million tonnes, of which 429 million tonnes fossil-based plastics, 29 million tonnes recycled plastic and 2 million tonnes bio-plastics**, being commonly used in a wide range of industries around the world, such as packaging manufacturing, consumer goods, electronics, automotive, aviation, textiles and agriculture.

Figure 3. **Production of plastics in million metric tons, 2021**
Source: Global Plastic Outlook 2022

Plastics are classified into two main categories: thermoplastics and thermosets. For example, thermoplastics can be reshaped after heating, while thermosets are irreversibly hardened. Elastomers have elastic properties, and fibers can be made of different polymers, but they are defined by their shape. Plastics are made of polymers, to which additives or other substances are added in order to prevent wear, color the plastic, ensure flexibility of rigid material, improve impact resistance, reduce flammability and generate foam as a blowing agent. The variety of polymers that can be produced represents the versatility of plastics and is shown in **Table 1.**

Table 1. **Variety and applicability of polymers in plastics**

Polymer	Abbreviation	PLASTIC TYPE	Example usage	Recyclable
Teraftal polyethylene	PET 1	1	Beverage packaging	Yes
High density polyethylene	HDPE 2	2	Toys, shampoo bottles, pipes	Yes
Polyvinyl chloride	PVC 3	3	Window frame, floor covering, pipes, cable insulation	Difficult
Low density polyethylene	LDPE 4	4	Reusable bags, food packaging film	Difficult
Polypropylene	PP 5	5	Food packaging, automotive components	Not
Polystyrene	PS 6	6	Food packaging, insulator, electrical equipment	Not
Polyurethane	PURE	7	Insulator, mattresses	Not most of the time
ABS, elastomer, plastic bio, PBT, PC, PMMA, PTFE	Others		Tyres, packaging, electronics, transport	
Fibres made from different polymers	Fiber		Textile applications and other sectors	

Due to their ease of manufacture, low cost, impermeability and resistance to chemicals, temperature and light, plastics are used in the production of a wide range of products, replacing many materials such as wood, paper, stone, leather, metal, glass and ceramics. Next, the data in **Figure 4** shows the share of plastics by polymer type and use. The main sectors of the global plastic-consuming economy are packaging, construction and transport, which account for 60% of total plastics use. The other main applications of plastics use include textiles, household and institutional products, electronics, tires, etc.

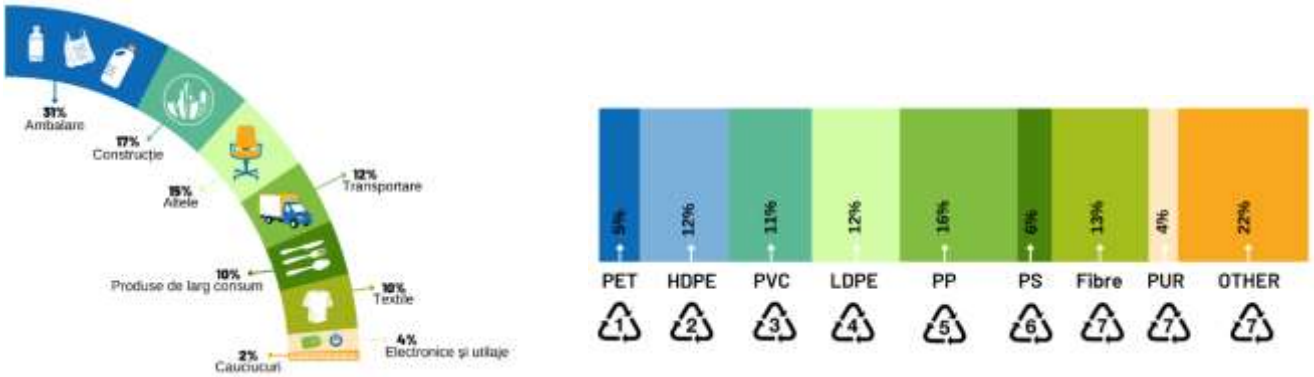


Figure 4. **Share of plastics by application and type of polymers, 2019**
Source: OECD Global Plastic Outlook

To benchmark plastics use across regions, the *OECD Global Plastic Outlook presents* 2 indicators: **plastics intensity relative to GDP** and **Plastic use per capita**, detailed in **Table 2**. These data confirm a very large variation between countries in plastics use per capita, ranging from 15.9 kg/person in Africa to 255 kg/person in the US, compared to a smaller variation between countries in plastics intensity relative to GDP, ranging from 2.5 to 4.5 tonnes per million USD (t/million USD). Notably, sub-Saharan Africa, which has the lowest plastics consumption per capita, has the highest plastic use intensity (4.5 t/million USD). This high intensity in use reflects Sub-Saharan Africa's very low GDP per capita in 2019 (around five times lower than the Middle East and North Africa and twice lower than India).

Table 2. **GDP as a key indicator in the global use of plastic (2019)**

			Plastic used per capita per year (kg/place)	**Intensity of plastic use relative to GDP (t/Mil.USD in PPP)**
Global			**60,1**	**3,5**
OECD			**155,8**	**3,7**
Non-OECD			**39,3**	**3,4**
OECD	OCDE America	HIS	**255,2**	**4,3**
		Canada	**202,2**	**4,3**
		Other OECD countries Americas	**65,4**	**3,6**
	OECD Europe	OECD EU countries	**152,9**	**3,6**
		OECD non-EU countries	**124,3**	**3,5**
	OCDE Pacific	OECD Asia	**102,4**	**2,6**
		OECD Oceania	**143,9**	**3,1**
Non-OECD	Other countries America	Latin America	**50,9**	**3,5**
	Eurasia	Other EU countries	**103,0**	**4,1**

		Other countries Eurasia	**66,7**	**3,7**
	Middle East and Africa	Middle East and North Africa	**47,1**	**2,5**
		Other countries Africa	**15,9**	**4,5**
	Other countries Asia	China	**69,0**	**3,7**
		India	**22,1**	**2,7**
		Other countries Asia	**31,7**	**2,7**

Source: OECD Global Plastic Outlook.

Importantly, plastic production is the largest industrial user of oil, gas and electricity in the EU, eclipsing other energy-consuming industries such as steel, automotive, food and drink. Plastic production was responsible for 9% of fossil gas consumption, 8% of oil consumption and 6% of EU energy consumption in 2020, equivalent to the Netherlands' final gas consumption and almost as much as Italy's final oil consumption in 2020[1].

In 2019, plastics generated 1.8 gigatonnes (Gt) of greenhouse gas (GHG) emissions – 3.4% of global emissions, with 90% of these emissions coming from fossil fuel plastic production.

In absolute numbers, the EU's consumption of fossil gas for plastic production equates to 25 billion m3 in 2020, of which around a quarter (around 7 billion m3) can be attributed to Germany and a fifth (around 4.5 billion m3) to the Netherlands alone.

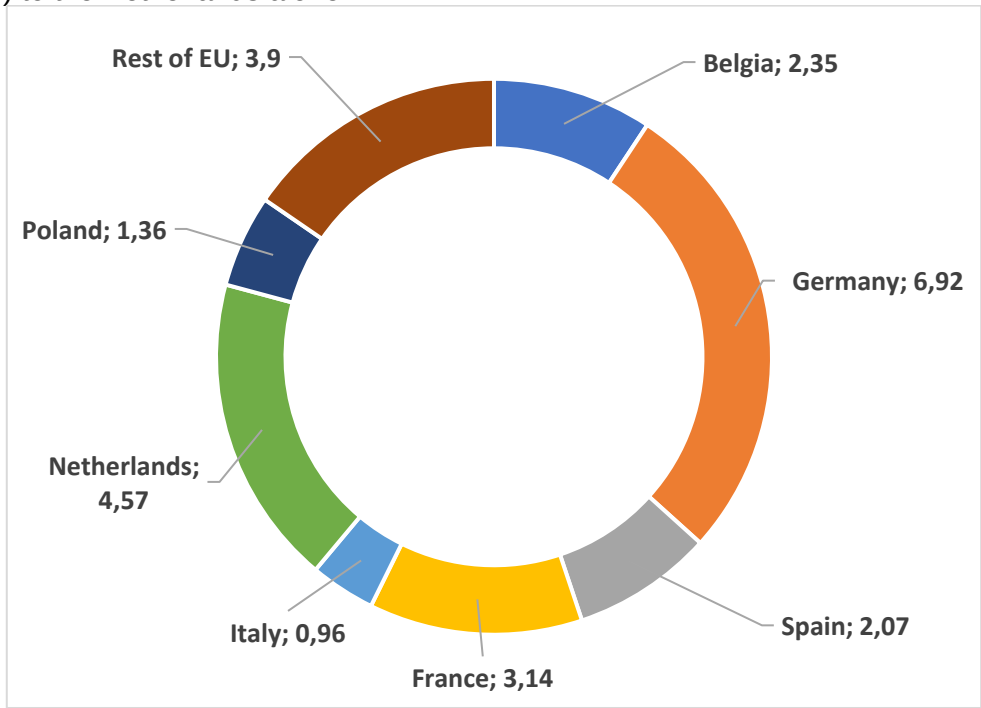


Figure 5. **Final gas consumption for plastic production in the EU, 2020 (billion m3)**

[1] Eurostat (2022). Final consumption oil

Source: Eurostat (2020) – Energy balance

In absolute numbers, in 2020, the EU consumed 35 million tonnes of oil and petroleum products to fuel its dependence on plastic. This is almost as much as Italy's final oil consumption in the same year.

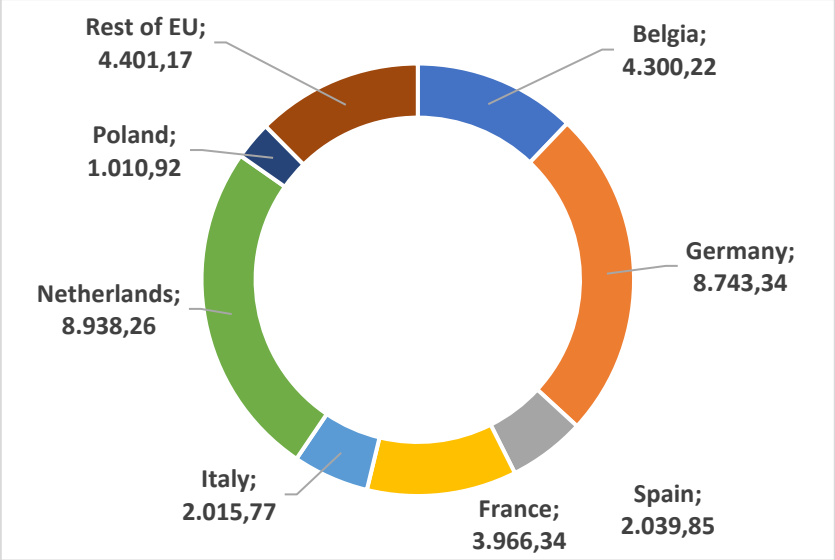


Figure 6. **EU final consumption of oil for plastic production, 2020 (thousand tonnes)**
Source: Eurostat (2020) – Energy balance

The production of plastics also consumes significant amounts of energy. In 2020, 6% of the EU's final electricity consumption was used for plastic production alone. The EU's largest plastic producers consumed around 132,000 gigawatt hours (GWh) of electricity in 2020.

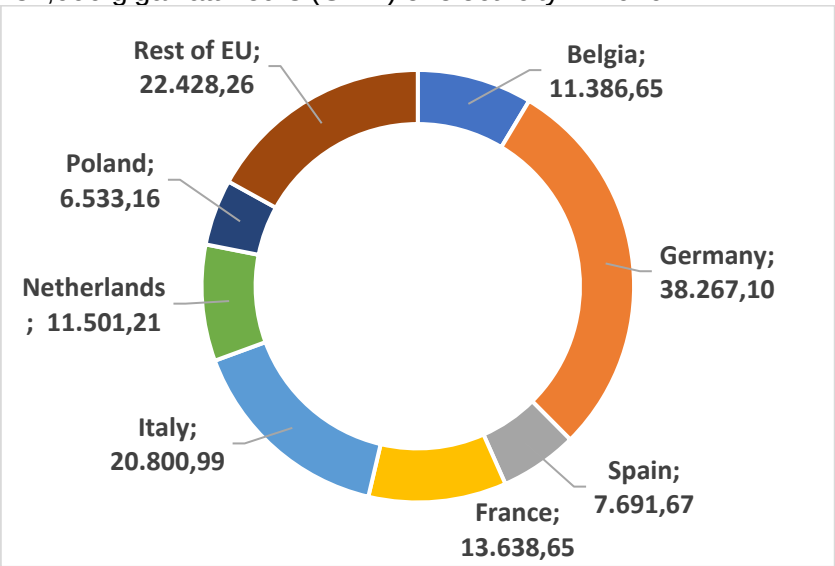


Figure 7. **Electricity consumption for plastic production in the EU, 2020 (GWh)**

Source: Eurostat (2020) – Energy balance

In 2019, the 7 largest petrochemical producing countries in the EU used a total of 21.62 billion m3 of gas and 30.4 million tonnes of oil for plastic production.

Currently, out of the total 460 million metric tons of plastics produced in 2021, 2 million tons go to bioplastics. However, in contrast to a slight decline in global plastic production, the bioplastics market has grown continuously. This trend is driven by growing demand combined with the emergence of more sophisticated applications and products. According to the latest market data compiled by *European Bioplastics* in cooperation with Nova-Institute, global bioplastics production capacities will increase from around 4.72 million tonnes in 2022 to around 7.59 million tonnes in 2026. Therefore, the share of bioplastics in global plastic production will exceed the 2% threshold.

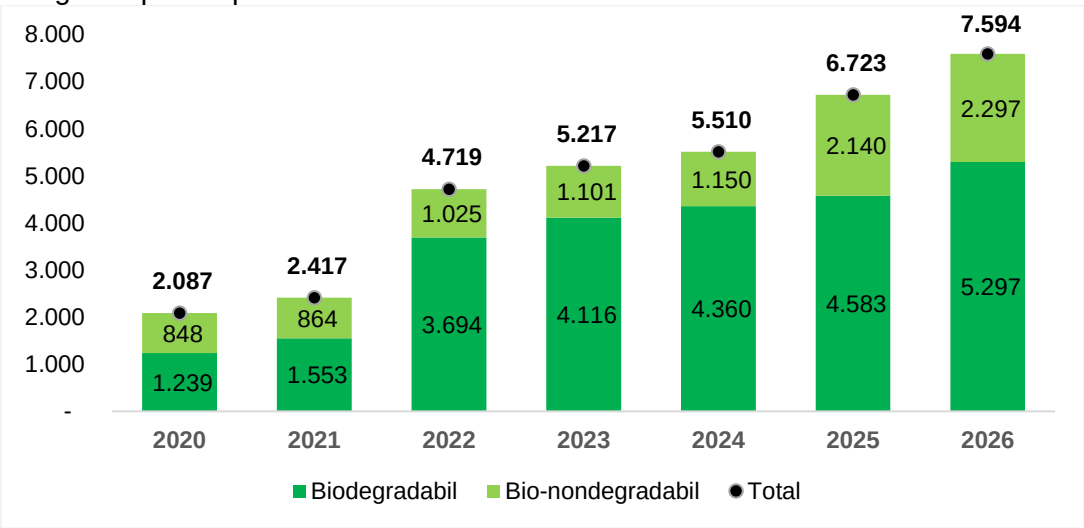


Figure 8. **Bioplastic quantity produced globally (thousand tons)**
Source: European Bioplastic (2021). www.european-bioplastic.org, www.bio-based.eu

Bioplastics have a very diverse use, such as packaging, catering, consumer electronics, automotive, agriculture/horticulture and toys, textiles, etc. Packaging remains the largest market segment for bioplastics, with 48% (1.15 million tonnes) of the total bioplastics market in 2021. However, the application portfolio continues to diversify.

Bioplastics can contain up to 75% of conventional fossil-based plastic

Over time, the production, consumption and disposal of plastic have resulted in a host of negative impacts on society, the environment and the economy. Currently, the cost of plastic's impact is not included in the price of the raw material from which it is made. According *to the study "Plastics: The Costs To Society, The Environment And The Economy",* plastic's cost to the environment and society is at least 10 times higher than its market price, generating significant costs for countries. The failure of authorities to better understand the real costs of plastic (e.g. plastic waste management cost, GHG emission costs, marine ecosystem pollution costs) has led to mismanagement of this material and increased environmental, social and economic costs. Unless urgent action is taken, producing plastic in 2040 could cost society $7.1 trillion (+/-$2.2 trillion), equivalent to about 85% of global spending on the health sector in 2018, and which is higher than the gross domestic product (GDP) of Germany, Canada and Australia combined.

1.2. Current plastic waste management systems

While the benefits of plastics are undeniable, their widespread use, as well as their inherent resistance to (bio)degradation, ultimately leads to their accumulation in the environment. Currently, it is estimated that plastic waste constitutes about 10%-12% of all municipal waste worldwide and 80% of all waste found in the world's oceans, ending up there through rivers and sewage systems. The life cycle of plastics from production to waste is shown in **Figure 9.** In 2021 alone, according to the data presented

in Figure no.9, a total of **353 million tons of plastic waste** were generated, of which **55 million tons were collected for recycling, 67 million tons incinerated**, **174 million tons disposed of** by landfilling and another 82 million tons discarded/disposed of non-compliantly.

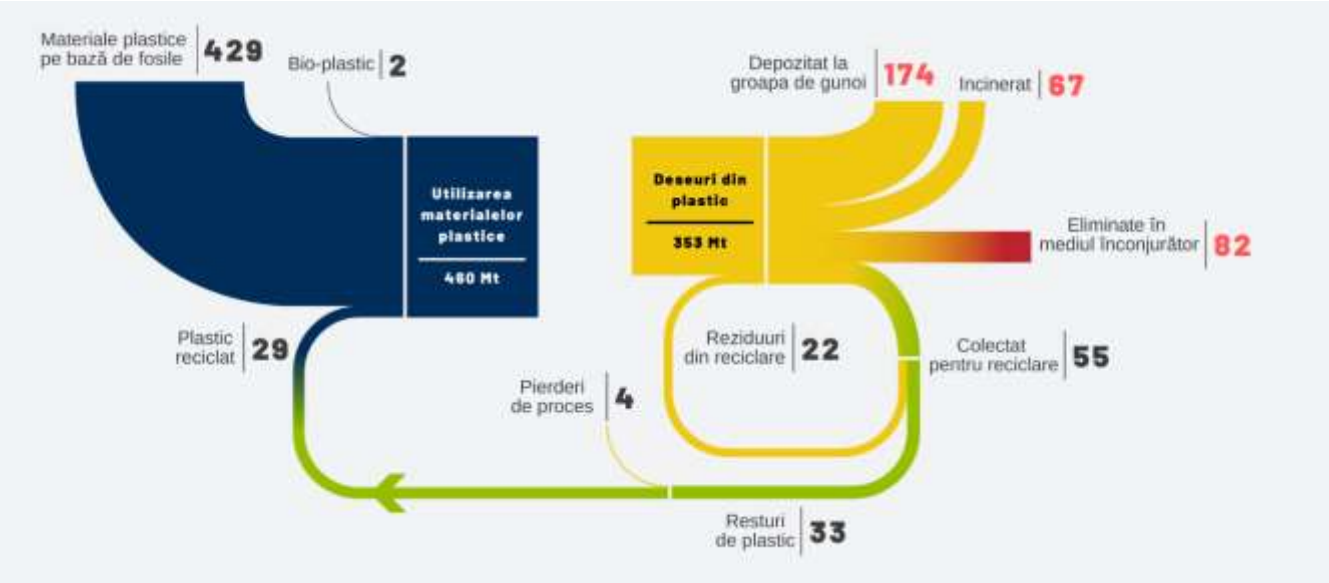


Figure 9. **Life cycle of plastics, million tonnes (Mt)**
Source: OECD Global Plastic Outlook

Data from ***Figure 9*** illustrates and confirms the challenges encountered in managing plastic waste. Of the total 55 million tonnes of plastic waste that has been collected for recycling, 22 million tonnes or 40% is recycling residue.

Of the total 22 million, the largest share belongs to macroplastics (88%), of which 82% have found their way into the environment as a result of inadequate collection and disposal. Other runoff routes include littering (5%) and marine activities (1%).

Microplastics also account for a significant share of naturally dispersed plastic (12%), ending up in the environment through tyre wear and road markings, as well as accidental loss of plastic pellets and washing of synthetic textile fibres.

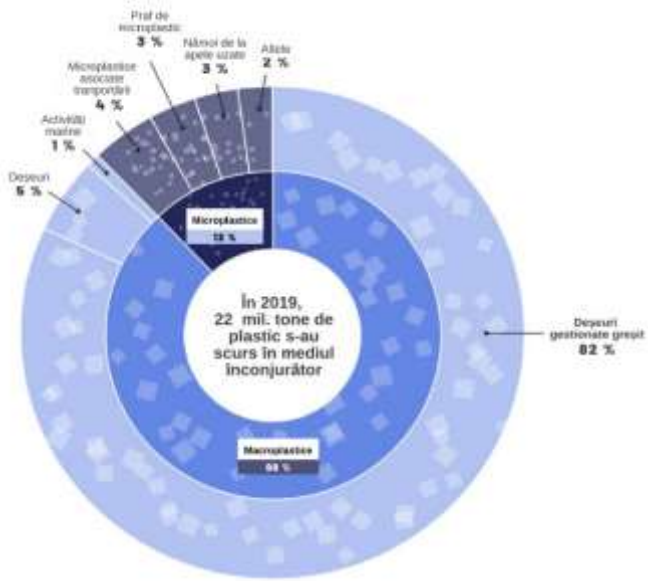


Figure 10. **Uncontrolled leakage into the environment – macro and micro plastics**

There remain 33 tonnes or 60% plastic waste subject to recycling. Finally, taking into account the losses resulting from the recycling process (+/- 12%), this results in 29 million tonnes of secondary plastics, which can be reintroduced into new production processes.

Of the total 353 million tonnes of plastic waste generated in 2021,
end up recycling 29 million tons or only 9%

Currently, plastics produced from recycled plastics represent only **6%** of the raw materials for new plastics produced globally. This is despite the fact that **global production of secondary plastics-based raw materials** has increased more than 4-fold in two decades, from 6.8 Mt in 2000 to 29 Mt in 2019.

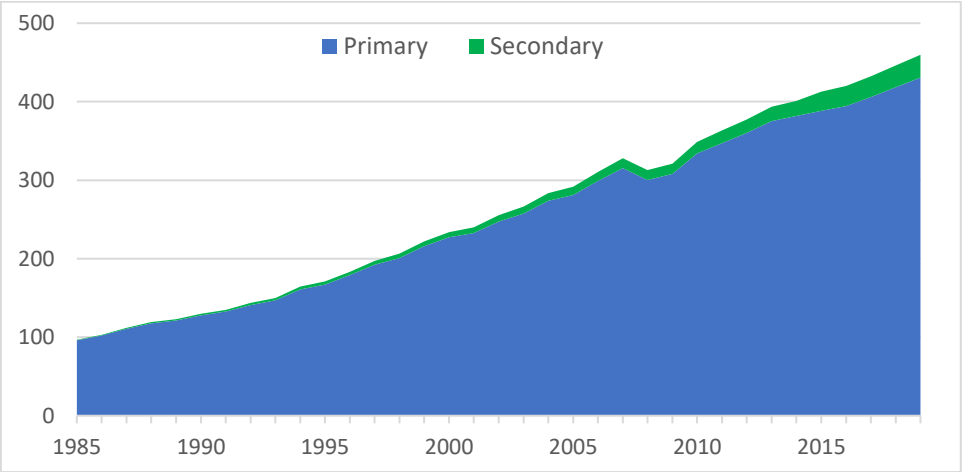


Figure 11. **Production secondary plastic-based raw materials**
Source: OECD Global Plastic Outlook

The origin of a plastic waste stream determines the level of purity that can be achieved after recycling and therefore the value of the resulting secondary plastic. Post-industrial waste and post-consumer commercial waste can be collected in large containers to minimize logistics costs. In addition, control mechanisms (e.g. employee training and visual inspection during collection) may favour high-quality waste streams and high market prices. In contrast, post-consumer household waste has a high collection cost (e.g. collection on the sidewalk is expensive) and often contains a substantial share of impurities. As a consequence, the collection of most household waste streams tends to generate a net cost for the responsible municipalities.
High-income countries with the highest recycling rates use extended producer responsibility (EPR) schemes to finance the collection of recyclable plastics from households and offset these costs. Currently, as presented in **Figure 12,** only recycling of PET and HDPE plastics shows widespread commercial viability. Mechanical recycling of polypropylene (PP) and polyvinyl chloride (PVC) also takes place, but to a lesser extent. At the same time, data from **Figure 13** It shows the main sectors using recycled plastics, with construction accounting for the largest share at 46%, followed by packaging at 24% and agriculture at 13%.

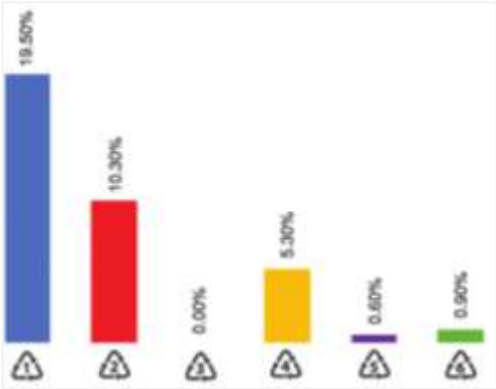


Figure 12. **Recycling rates on different types of polymers**

Figure 13. **Sectors using recycled plastics (EU)**

Plastic waste is recycled on a large scale only if it is profitable to do so. Economic and regulatory policy instruments can provide a business case for collecting and recycling plastic waste. In addition, incentivising sorting at source is a critical lever, as the quality of sorting determines the purity and value of recycled materials and therefore the profitability of recycling operations. High landfill and incineration fees are powerful drivers of recycling, as are landfill bans.

Plastic waste generation depends on the use of plastics and the service life of products. In **Figure 14** The average lifespan of a plastic product is presented, which is almost 10 years, although this depends on its use. Packaging has an extremely short average lifespan (maximum 6 months), while plastics in the construction sector can be used for several decades.

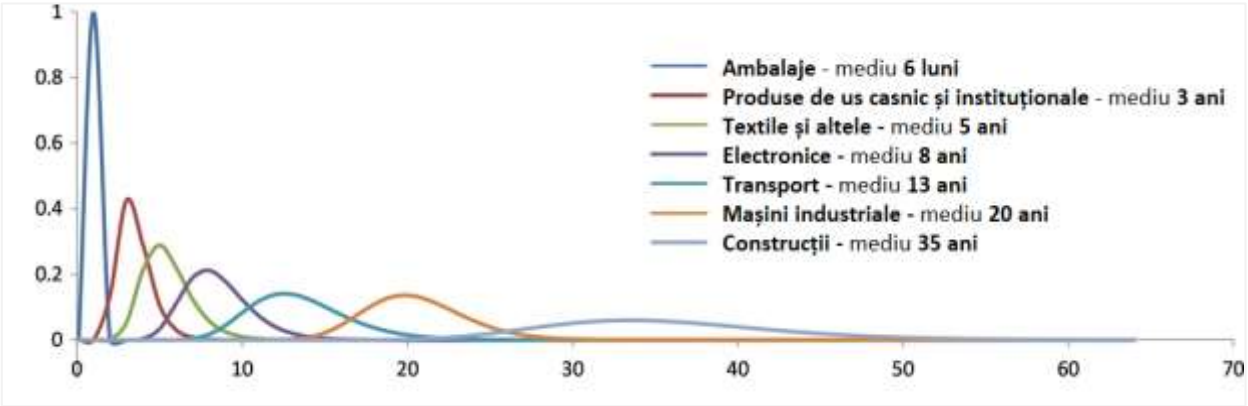


Figure 14. **Average duration of plastic use – by type of products**
Sursa: Geyer, Jambeck and Law

Suitable Global Plastics Outlook, OECD countries generate almost half of all plastic waste, led by the United States of America - 21%, OECD Europe - 19% and the rest OECD countries - 9%. Outside the OECD, China produces 19% of global plastic waste, India 5% and the rest of the world 27%. In terms of waste per capita, there are large differences worldwide as shown in Table 3.

Table 3. **Amount of plastic waste generated per capita**

			Plastic waste per capita (kg/place), 2019
OECD	OCDE America	USA	**220,5**
		Canada	**177,9**

		Other OECD Americas countries	**57,9**
	OECD Europe	OECD EU countries	**121,6**
		OECD non-EU countries	**94,4**
	OCDE Pacific	OECD Asia	**68,9**
		OECD Oceania	**62,1**
Non-OECD	Other countries America	Latin America	**43,4**
	Eurasia	Other EU countries	**75,5**
		Other countries Eurasia	**53,0**
	Middle East and Africa	Middle East and North Africa	**37,6**
		Other countries Africa	**14,5**
	Other countries Asia	China	**46,6**
		India	**14,0**
		Other countries Asia	**21,4**
Moldova	**Moldova**	**Moldova***	**45,0**

** The amount of plastic waste generated at national level has been estimated according to the calculations in Table no.17*

One inhabitant of the United States annually generates the largest amount of plastic waste - 221 kg / head / place, while OECD inhabitants of Europe - 114 kg / head. Plastic waste production in Japan and Korea is lower by an average of 69 kg/head.loc. The lowest quantities of waste generated are recorded in China - 47 kg / head / place and India - 14 kg / head place.
Of the 353 million tonnes of plastic waste generated globally, 67 million (19%) tonnes of plastic are incinerated while 174 million (49%) tonnes are landfilled. Whether plastic waste, especially municipal solid waste (MSW), is incinerated or landfilled depends on existing infrastructure, regulations, local population density and costs.

In 2019, **the EU produced 57.9 Mt of plastic**, of which more than 22 million tonnes of packaging plastic. During the same period, the EU generated 15 million tonnes of plastic packaging waste. For every 100 kg of plastic packaging produced in the EU, 65 kg of waste was generated plastic packaging, two-thirds of which has been landfilled or incinerated.

As landfilling requires large areas of land, densely urbanised countries and regions such as Japan and Western Europe rely heavily on incineration. However, because well-controlled incineration is almost three times more expensive than landfilling, countries and cities with more available space have kept sanitary landfills as the primary method of disposal.

Most studies indicate that the overall environmental impact of incinerating waste with energy recovery is better than landfilling, but worse than recycling. Incineration destroys secondary raw materials that could fuel (develop) the circular economy and aim to maintain the highest value of materials. Another disadvantage of incineration is that plants require a high amount of capital intensity, which leads operators to use them at full capacity. As a result, large-scale investments in waste incineration can lock down this infrastructure for many years, leading to competition with recyclers for raw materials. This is especially true when investments are related to heat recovery and central heating. **To accelerate the transition to the circular economy, waste incineration will need to be gradually replaced by recycling and waste prevention**[2].

[2] https://espas.secure.europarl.europa.eu/orbis/sites/default/files/generated/document/en/plastic.pdf

Sustainable and circular management of plastic waste depends on local capacities and regulations for each of the management stages (collection, sorting, transportation, recycling, disposal, incineration, etc.). Each of these stages is organised differently for least developed or developing countries compared to highly developed countries. It is obvious, on whose shoulders are the biggest challenges in the fight against plastic waste, which is why the national policy framework must aim until recycling, as a priority, to **reduce plastic consumption**. Reducing plastics can be done by optimising product design and imposing import restrictions on single-use products, and reuse can be done by switching from single-use plastic products to more durable (reusable) plastic products, which can reduce energy consumption per consumption cycle.

Table 4. **Comparative overview of plastic waste management systems**

	Weak or developing countries	Highly developed countries
Collection	• Partial coverage with waste collection services. • The informal sector plays an important role in collecting and sorting recyclables. • High sorting quality is achieved only for waste streams with positive economic value, such as PET bottles.	• Municipal waste collection schemes. • The quality of sorted waste is influenced by the habits of the population, existing facilities for collection and financial incentives. • Collection systems are highly mechanized.
Sorting	• Collection is usually done manually. • Shortage/shortage of equipment for compaction of plastic waste.	• Mechanized sorting of waste with maximum recovery of valuable plastic.
Transportation	• Waste of low economic value is usually disposed of by landfilling. • The local recycling industry usually operates on imported plastic waste.	• Plastic waste is largely recycled nationwide. • Lower value plastic waste is exported to other countries for recycling.

Source: Improving Markets for Recycled plastic https://www.OCDE.org/env/improving-markets-for-recycled-plastics-9789264301016-en.htm

Recycling plastics and use as 'secondary' plastics can reduce pressures on the environment when reducing or substituting plastics is not feasible or would lead to a higher environmental impact and when a sustainable plastic product reaches end-of-life. The recycling of plastics is therefore an important component of the circular economy.

1.3. Plastic packaging. Challenges and solutions.

Plastic waste from landfills is mismanaged, especially single-use packaging. They generate significant economic and social costs worldwide, reducing the productivity of vital natural systems and hampering the development of urban infrastructure. Globally, the cost of externalities after using plastic packaging, plus the cost associated with greenhouse gas emissions from its production, is estimated at $40 billion annually, exceeding the profit fund of the plastic packaging industry.

From 2014 to 2019, plastic packaging waste increased by 16% in the EU and shows no signs of slowing down[1]. The latest industry forecasts on plastic packaging and waste of household plastic items in the EU suggests that:
will grow steadily at 1% per year until 2050.

In 2020, each person living in the EU generated an average of 34.6 kg of plastic packaging waste. Of these, 13.0 kg were recycled. Between 2010 and 2020, the volume of plastic packaging waste generated per capita increased by 23% (+6.5 kg). The recycled volume of plastic packaging waste increased over the same period, by 32% (+3.2 kg).

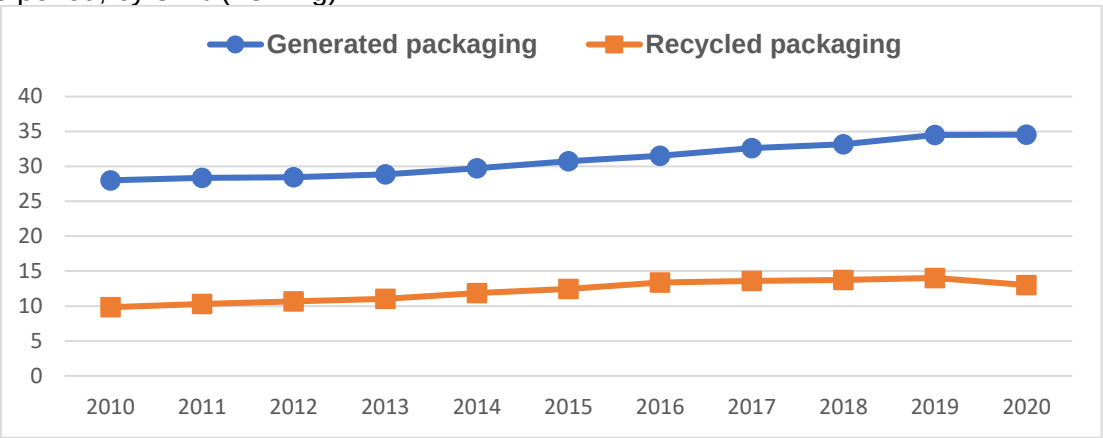


Figure 15. **Plastic packaging waste generated and recycled in the EU period 2010-2020, (kg per capita)**
Source: Eurostat

Despite this improvement, the amount of plastic packaging that has not been recycled has increased by 3.4 kg per inhabitant since 2010 due to the greater increase in the absolute amount of plastic packaging waste generated. In 2020, stricter rules came into force for reporting the amounts of plastic waste recycled among EU countries. For this reason, a provisional decrease of 3 percentage points was observed (from 41% in 2019 to around 38% in 2020).

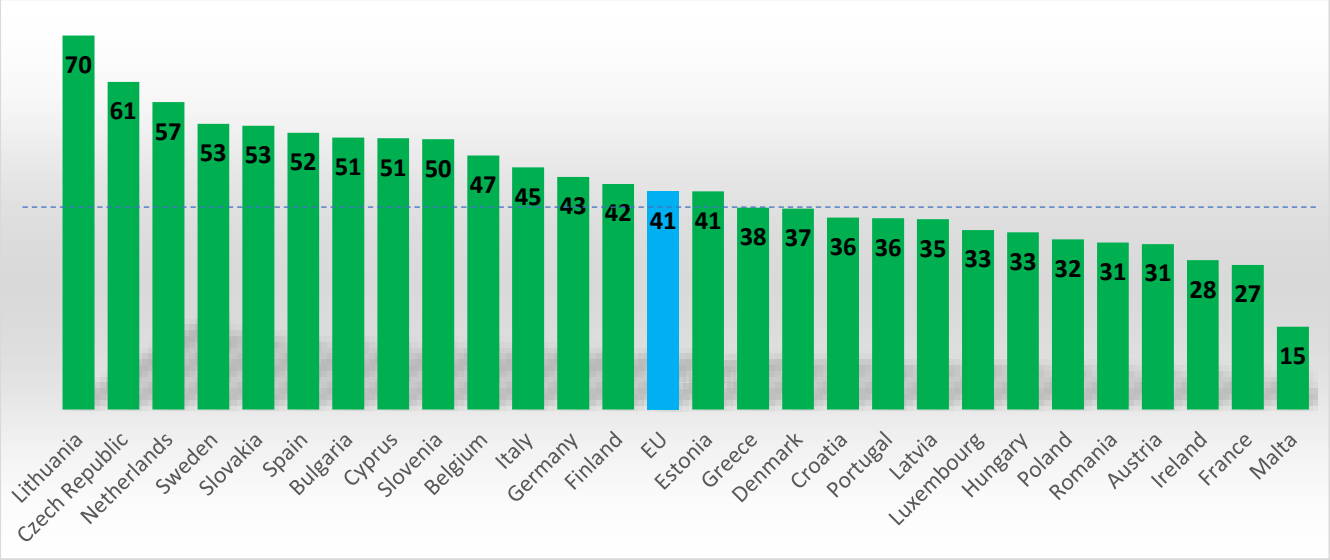


Figure 16. **Recycled plastic packaging waste in the EU**
Source: Eurostat https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20221020-1

The Netherlands, Germany, Belgium, France, Spain, Italy and Poland are not only the seven largest consumers of oil, gas and electricity for petrochemical production. It is also among the top 10 plastic packaging waste generators in the EU – generating an average of 35kg of plastic packaging waste per capita each year. In 2019, in total, these seven countries produced around 11.8 million tonnes of plastic packaging waste, with Germany alone producing 3.2 million tonnes, followed by Italy and France with 2.3 million tonnes. Together, the largest plastic producers in the EU are responsible for 77% of all plastic packaging waste in the EU. Not only does it consume the most energy for plastic production, but it also generates the most waste.

Table 5. **Increase in plastic packaging waste generated 2014-2019**

	EU-27	Belgium	Germany	Spain	France	Italy	Holland	Poland
Plastic Waste	16,03%	4,12%	7,53%	17,14%	14,28%	13,14%	7,26%	44,87%

An effective mechanism in managing packaging waste, including plastic waste, is Extended Producer Responsibility (EPR), first conceived and implemented in Germany in the late 80s. This mechanism has proven to be an absolutely necessary and functional tool for the transition to a circular economy, being directly focused on the application of the "polluter pays" principle, according to which anyone who places packaging or packaged goods on the market of a country remains responsible for them until the end of the life cycle of the packaging, including the period of time after disposal. The development of EPR schemes in Europe has contributed to improving waste prevention, reuse and recycling, including increasing the recycling rate of packaging waste. There are already more than 400 EPR schemes globally, of which at least 70 are for packaging.

Since 2020, this mechanism has also been implemented in the Republic of Moldova, regulated by Government Decision no. 560/2020 on the approval of the Regulation on packaging and packaging waste. For 2023, plastic packaging producers have the obligation to register and report to the Environment Agency the minimum target for recovery through recycling / plastic packaging of 10%. The first official results on EPR implementation and target achievement will be published by the Environment Agency in 2024.

An effective tool for implementing EPR that is also to be used at national level is the Deposit Refund System (DRS). Most importantly, it has been demonstrated that no other collection method can effectively recover 90% of beverage containers for closed-loop recycling as DRS does. Confirmation of this result is also shown in Table 6.

Table 6. **How DRS works for packaging in Europe in 2020**

Country	Number of population 2021 (millions)	DRS implemented	Packaging Type	Access population per collection point	Deposit amount	Packaging recovery rate	PLASTIC recovery rate	Recovery rate METAL	Recovery rate GLASS
Croatia	4,1	2006	Plastic, metal and glass *(containers >200ml)*	~1,922 (70% manual / 30% automatic)	**Flat rate**: €0.07	90,7%	87,9%	81,1%	93,4%
Denmark	5,8	2002	Plastic, metal and glass	~1900 (95% automatic / 5% manual)	**Variable rate**: Metal, glass <1L: €0.13 Plastic <1L: €0.20 Metal, glass, plastic 1-20L: €0.39	93%	95%	92%	93%
Estonia	1,3	2005	Plastic, metal and glass *(containerse 100ml-3L)*	~1663 (93% automatic / 7% manual)	**Flat rate**: €0.10	89%	91%	94%	87%
Finland	5,5	1996	Plastic, metal and glass	~1230 (97% automatic / 3% manual)	**Variable rate (VAT included):** Plastic ≤350ml: €0.10 Plastic 351ml -999ml: €0.20 Plastic ≥1L: €0.40 Metal: €0.15 Glass: €0.10	96%	90%	97%	98%
Germany	83,2	2003	Plastic, metal and glass *(containers 100ml-3L)*	~640 (90% automatic/ 10% manual)	**Flat rate:** €0.25 (VAT Incl.)	98%	N/A	N/A	N/A
Iceland	0,4	1989	Plastic, metal, glass	~6147 (80% automatic/20 % manual)	**Flat rate:** €0.12	91,4 %	92,1%	93,2%	82,5%
Latvia	1,9	2022	Plastic (mostly PET), metal, (aluminium, steel), glass	~1402 (automated and manual)	**Flat rate**: €0.10 (VAT not applicable)	-	-	-	-

Lithuania	2,8	2016	Plastic, metal and glass *(containers 100ml-3L)*	~1035 (91% automatic/9 % manual)	**Flat rate**: €0.10	90%	90%	92%	84%
Malta	0,5	2022	Plastic (mostly PET), metal, (aluminium, steel), glass	~1720 (no data)	**Flat rate:** €0.10 (VAT not applicable)	-	-	-	-
Holland	17,5	2005	Plastic *(containers ≥ 800ml)*	~3121 (97% automatic/3 % manual)	**Variable rate**: Plastic <1L: €0.15 Plastic 1-3L:€0.25	70%	57% Plastic <1L and 90% Plastic >1-3L	-	-
Norway	5,4	1999	Plastic and metal	~360 (93% automatic/7% manual)	**Variable rate:** Plastic, metal <0.5L: €0.20 Plastic, metal ≥ 0.5L: €0.30	92,30 %	92,8%	91,5%	-
Slovakia	5,5	2022	Plastic (PET), metal	~2730 (80% automatic/20 % manual)	**Flat rate**: €0.15	-	-	-	-
Sweden	10,4	1984	Plastic and metal	~877 (96% automatic/4 % manual)	**Variable rate:** Metal: €0.11 (VAT Incl.) Plastic ≤1L: €0.11 (VAT Incl.) Plastic >1L: €0.19 (VAT Incl.)	88,20%	86,4%	89%	-

Sursa: Global Deposit Book 2022

According to data analyzed and published by the Global Deposit Book 2022, the higher the value of the deposit, the higher the recovery rate of the packaging.

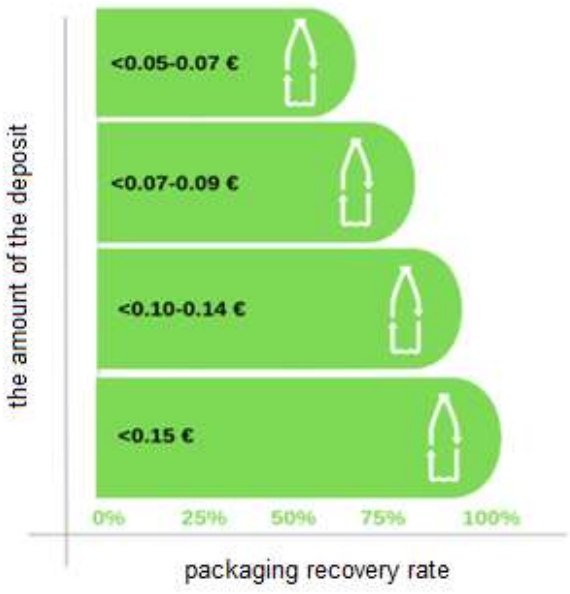


Figure 17. **Packaging recovery rate depending on the value of the deposit**
Sursa Global Deposit Book 2022

One of the basic objectives of the Study is to demonstrate that recycling is not the only and far from the most effective solution in the fight against plastic. It is important to identify new solutions, directly based on the principles of the Waste Hierarchy with a focus on Prevention, Reduction and Reuse, which is not in vain the cornerstone of EU and national waste policy and legislation. Despite the environmental and economic benefits, Europe has seen a steady decline in the share of reusable packaging in recent decades. Most packaging on the market loses more than 95% of its value after first use. Recent decades have led to an unprecedented increase in the use of single-use packaging and a decrease in the reusability and recyclability of packaging. The quantitative assessment of 20 products selected for the study "**#GetBack: Europe's transition to reusable packaging"** developed in May 2022 by Zero Waste Europe and Recycling Netwerk Benelux, as part of the European project - **the ReuSe Vanguard Project** shows worrying figures in terms of consumption of single-use packaging.

Table 7. **Consumption of single-use packaging in the EU-28, 2019 (thousand tonnes)**

CONSUMPTION OF SINGLE-USE PACKAGING	
Disposable packaging for BEVERAGES	**14 380,80**
Wine (disposable glass packaging)	7 651,50
Beer	3 465,10
Glass packaging Aluminum cans **PET bottles**	3 117,99 258,60 88,50
Carbonated drinks	1 056,40
Glass packaging Aluminum cans **PET bottles**	345,60 149,10 561,70
Carbonated water	831,30

Glass packaging Aluminum cans **PET bottles**	188,30 3,20 639,80
Still water	779,20
Glass packaging **PET bottles** Cardboard packaging	131,30 646,20 1,70
Juices	597,30
Glass packaging Aluminum cans **PET bottles** **HDPE bottles** Cardboard packaging	276,40 6,10 125,70 2,20 180,50
Single-use packaging for e-Commerce	2 848,20
Cardboard boxes	2 495,40
Envelopes	283,50
Magazine packaging	44,80
Plastic bags for delivery	24,50
Single-use packaging for TAKEAWAY DRINKS	169,70
Paper cups	31,90
Plastic cups	137,80
Disposable packaging for TAKEAWAY	
Cardboard boxes for pizza	186,50
Cardboard packaging (other than for pizza)	430,90
Plastic (PP)	519,80
Aluminium	125,40

Source: GetBack: Europe's transition to reusable packaging"

According to the GetBack Study, more than 50 billion containers of water and nearly 40 billion containers of juice drinks were sold in 2019. A large proportion of PET bottles could be replaced with reusable packaging. A decade ago, there was a higher share of reusable packaging, but this has fallen dramatically with the advent of single-use products: from 2009 to 2019, the market share of reusable packaging for water fell from 27% to 22%.

According to official data, reusable beverage containers have mostly been replaced by single-use packaging (mostly single-use plastic, cans and cardboard cups). **In Europe, sales of reusable beverage containers fell from 90 billion units in 2000 to 55 billion units in 2015,** according to the data presented in **Figure 18***.*

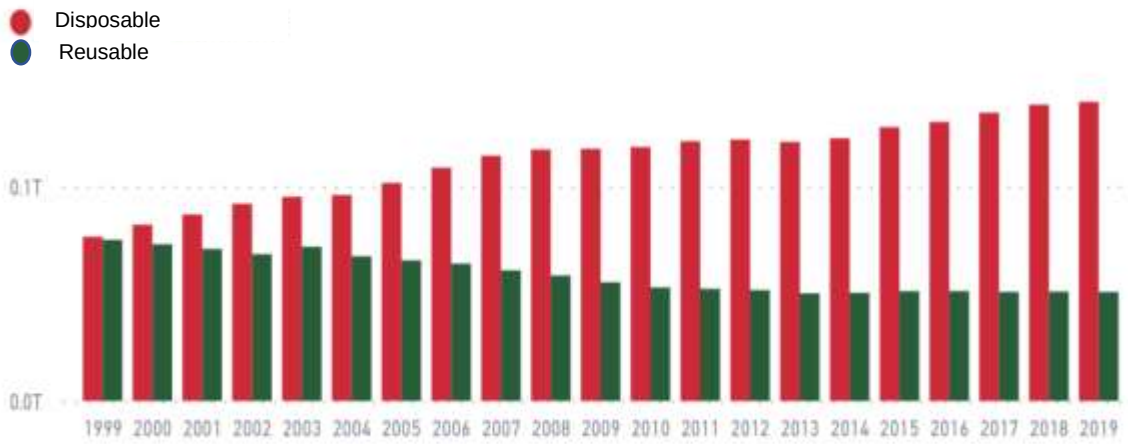


Figure 18. **Sales of containers: Reusable and disposable (EU)**
Source: Study #GetBack: Europe's transition to reusable packaging

There are many reasons behind this unsustainable scenario, but most of them involve the economic factor: costs. For example, many companies and retailers have switched to single-use packaging due to cheaper prices and "simpler" operations compared to reuse systems (which require a higher initial investment, labor, space and recovery management). The cost competitiveness of single-use packaging can also be explained by outsourcing costs to society and the environment, as EPR (Extended Producer Responsibility) fees cover only part of collection and treatment, while producers working with reusable packaging have to consider the total costs of take-back and refill.
As a result, the trend towards single-use packaging has led to a massive increase in the use of resources and materials, as well as an enormous and rapid increase in the volume of waste and its impact on the environment. Single-use packaging remains highly problematic for waste and environmental management**, and just because packaging has been collected separately for recycling does not mean it will be recycled and turned into new packaging.**

7 years after the first European Roadmap for a Circular Economy, at European level, reusable packaging is neither incentivised nor properly regulated! Incentives are needed to provide legal certainty for reusable packaging, thus encouraging a shift from currently used single-use packaging to reusable packaging.

Plastics are also a source of concern for human health due to the elimination and adsorption of hazardous chemicals, as well as their bio-accumulation in substances and organisms consumed by humans. According to the WWF International Study, people consume nearly 2,000 microplastics every week, which is about 5 grams or a full teaspoon. In the same context, a study carried out by the UNWAPPED project funded by the Plastic Solutions Fund, shows that 12 000 chemicals are used globally in the manufacture of food contact materials. Many of these chemicals are used as additives to plastic packaging to provide flexibility, color and durability against heat or sunlight. Many chemicals are also used in making paper, fiber, and food packaging from mixed materials. Materials such as glass, stainless steel and ceramics are known to be more inert and allow less chemical penetration into products. **Instead, plastic, paper and cardboard are, on the contrary, "chemical pest-friendly" materials, so they can propagate in the food we eat.**

1.4. European regulatory framework for plastic and plastic waste management

The data presented in Chapter 1 reconfirm that although many of the solutions needed to reduce plastic pollution are already known, we have failed to implement them due to lack of financial resources, limited technical capacities, low/deficient cooperation between international institutions, central / local authorities and business environment / industrial sector, incomplete transposition of the regulatory framework, etc. Next, **Table 8** presents an overview of the European regulatory framework on plastic waste management:

Table 8. **Summary of the European regulatory framework on plastic waste management**

Year	Act	Description	Transposed into national law
1994	DIRECTIVE 94/62/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 December 1994 on packaging and packaging waste	This Directive aims to harmonise national measures concerning the management of packaging and packaging waste in order, on the one hand, to prevent any impact thereof on the environment of all Member States as well as of third countries, or to reduce such impact, thereby ensuring a high level of environmental protection, and, on the other hand, to ensure the functioning of the internal market and to avoid obstacles to trade and distortion and restriction of competition within the Community.	Yes
2015	DIRECTIVE (EU) 2015/720 on reducing the consumption of lightweight plastic carrier bags	Some plastic carrier bags are marked as 'oxobiodegradable' or 'oxo-degradable' by their manufacturers. In the case of these bags, additives are incorporated into conventional plastics. As a result of the presence of these additives, over time, plastic fragments into small particles, which remain in the environment. Thus, the designation of such bags as 'biodegradable' may be misleading, as they may not be a solution to the problem of waste abandonment but, on the contrary, may increase pollution. The Commission should assess the impact of the use of oxo-degradable plastic carrier bags on the environment and submit a report to the European Parliament and to the Council including, where appropriate, a set of measures designed to limit the consumption of such bags or to reduce their potential harmful impact.	Partially
2015	Circular Economy Action Plan	Plastics is identified as a key priority and the plan committed to "prepare a strategy to address the challenges posed by plastics along the value chain and taking into account their entire life cycle".	NOT
2018	European Strategy for Plastics in a Circular Economy	The plastics strategy calls for updating the 1994 Packaging and Packaging Waste Directive and doubling the current recycling target to 50% in	NOT

		2025 and even 55% in 2030. Meeting these objectives would be a significant step towards achieving the EU's circular economy goals.	
	DIRECTIVE (EU) 2018/851 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2018 amending Directive 2008/98/EC on waste	It amended the Waste Framework Directive, for example, introducing general minimum requirements for EPR schemes and outlining measures Member States must take to prevent waste generation. Overall, the revised Waste Framework Directive updated waste management rules in the EU.	Partially
2019	DIRECTIVE (EU) 2019/904 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 June 2019 on the reduction of the impact of certain plastic products on the environment	In order to limit the negative impact of single-use plastic products on the environment, Member States should be required to prohibit their placing on the market. Doing so would promote the use of those easily accessible and more sustainable alternatives, as well as innovative solutions for more sustainable business models, reuse alternatives and substitution of materials.	NOT
2019	The European Green Deal	It set out a roadmap for no net greenhouse gas emissions by 2050, which implies economic growth not directly dependent on resource use. The Commission said it would follow up on the Plastics Strategy and focus on implementing the new legislation, including targets and measures to tackle overpackaging and waste generation, legal requirements to boost the market for secondary raw materials with mandatory recycled content, requirements to ensure that all packaging on the EU market is reusable or recyclable in an economically viable manner by 2030, and introduce a regulatory framework for biodegradable and bio-based plastics.	NOT
2020	New Circular Economy Action Plan for a cleaner and more competitive Europe	The Commission proposes binding recycled content requirements and waste reduction measures for key products such as packaging, construction materials and vehicles, while taking into account the activities of the Circular Plastics Alliance.	NOT
2020	Decision on own resources: taxes on non-recyclable plastic;	From 1 January 2021, EU member states are obliged to pay a fee of €0.80 for each kilogram of non-recycled plastic packaging waste. This includes, for example, packaging materials that are not intended for further processing into products, materials or substances.	NOT
2020	European Pact against Plastics	The pact sets common objectives and aims to encourage cross-border connections, cooperation, innovation and harmonisation at European level to accelerate a circular plastics economy in Europe. The pact has 147 signatories, including 21 signatories from European countries. The 4 strategic objectives of	NOT

		the pact foresee 1) Design for reuse and recycling, 2) Responsible use of plastics, 3) Collection, sorting and 4) Use of recycled plastic.	
2021	Commission guidance on single-use plastic products under Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment	It provides guidance on the interpretation and implementation of Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment.	NOT
2022	COMMISSION REGULATION (EU) 2022/1616 of 15 September 2022 on recycled plastic materials and articles intended to come into contact with food, and repealing Regulation (EC) No .../... 282/2008	It requires the decontamination of plastics during their recycling to a level that ensures that the remaining contaminants cannot endanger human health or otherwise affect food if used for the production of recycled plastic food contact materials and articles. The Regulation sets out in Table 1 of Annex I, the List of suitable recycling technologies, including Table 3 with Detailed description of decontamination technology.	NOT

Chapter 2. STUDY RESULTS: PLASTIC WASTE IN THE REPUBLIC OF MOLDOVA

2.1. National plastics market

In carrying out the Study on plastic waste in the Republic of Moldova, it was started from the analysis of the plastics market at national level and respectively the presentation of the research results for key indicators such as: Export-Import Market plastic in national GDP, quantities of plastics imported and exported by type, manufacturers of plastic products – according to CEAM, including territorial division and size of the company, etc. This data is important to map the current situation of plastic flows and to link this data to the current plastic waste management system described in Subchapter 2.2. The market of plastics and plastic articles, based on customs declarations for export and import of legal entities, for 2022 was about 7 billion lei (***Figure 19***). Notably, during the last 10 years analyzed, the value of the import/export market of plastics registered a steady increase, with an average of 4% annually and 43% in 2022 compared to 2012.

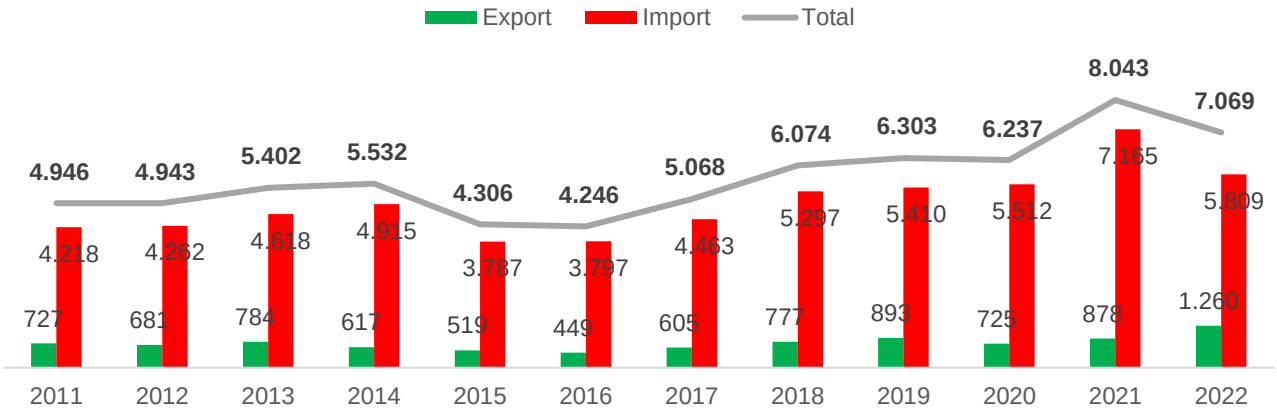


Figure 19. **Value of the Export-Import Market of Plastics (mil. lei)**

Source: www.statistica.md (2011-2021), Customs Service (2022)

Data from ***Figure 19*** and data presented by the National Bureau of Statistics confirm that the largest share of the plastics market belongs to IMPORT – 82%, and only 18% goes to EXPORT *(*Figure *20)*.

Figure 20. **Share of Import/Export on the plastics market (mil.lei)**
Source: www.statistica.md

In 2022, according to data provided by the Customs Service (Section VII, Chapter 39 of the Combined Nomenclature of Goods), **97.2 thousand tons of plastics were imported** , while **16 thousand tons were exported**. Notably, over the last 10 years analysed, the amount of plastics has been steadily increasing, averaging 4% annually and 27% in 2022 compared to 2012.

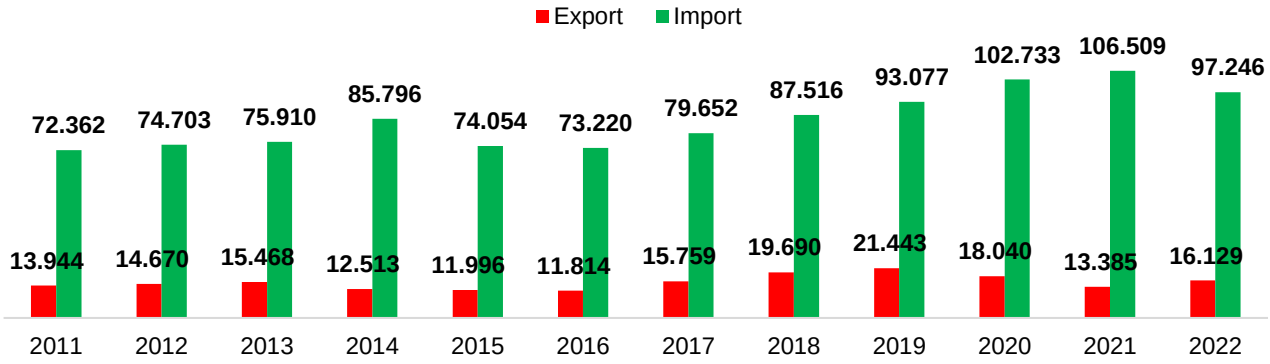


Figure 21. **Quantity of Export-Import plastics (tonnes)**
Source: Customs Service

The analysis of the types of plastics that are important and exported nationally is detailed in

Table 9 and ***Table 10***. Of the total tariff headings presented and analyzed, 5 cumulate 59% of the total quantity imported into the country in 2022.

Table 9. **Plastics Import (year 2022)**

Tariff Code Group	Description of goods	Quantity (kg)	Share of total
3920	Other plates, sheets, sheets, strips, ribbons, film and slides, of plastics	12.913.273	13%
3923	Transport or packaging articles of plastics;	12.300.234	13%
3901	Ethylene polymers, in primary forms:	12.006.852	12%
3916	Monofilaments with maximum sectional size	10.777.231	11%
3917	Tubes, pipes, hoses and accessories thereof, of plastics	9.433.748	10%

Source: Customs Service

For Export, out of the total different tariff headings presented and analyzed, quantities greater than 1000 tons are for 3 types headings that cumulate 86% of the total export and mostly represent packaging.

Table 10. **Plastics Export (2022)**

Tariff Code Group	Description of goods	Quantity (kg)	Share of total
3923	Transport or packaging articles of plastics;	7.531.564	47%
3925	Articles for the equipment of buildings, of plastics,	3.330.133	21%
3921	Other plastic plates, sheets, film, strip and blades	2.929.554	18%

Source: Customs Service

In the Republic of Moldova there are **388 companies** which are engaged in the manufacture of plastics products. The largest share is held by companies manufacturing plastics for construction – 269 companies, or 69% of the total companies producing plastic articles (***Figure 22.***).

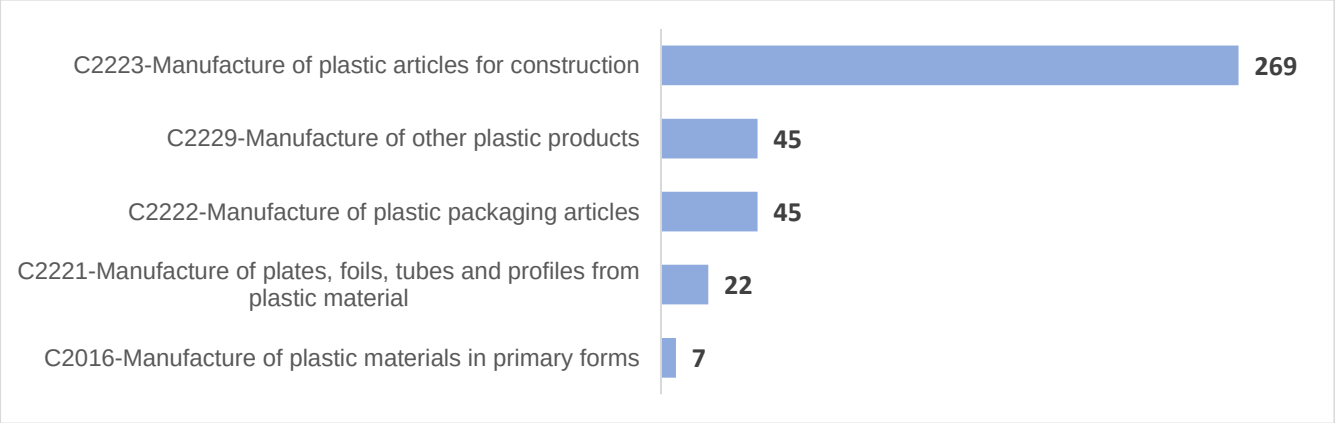


Figure 22. **Producers of plastic products – according to CEAM (2021)**
Source: NBS

Most producers operate in mun. Chisinau – 202 producers (52% of producers), mun. Balti with 25 producers, ATU Gagauzia – 22, Soroca district – 12, Anenii Noi district – 12 and Causeni district – 11 producers. The remaining 104 producers (27% of the total) – operate in 25 districts of the Republic of Moldova. Therefore, in most districts of the Republic of Moldova there is at least one producer of plastic items. From ***Table 11*** we note that the largest producers are in mun. Chisinau – 13 out of 16 large companies, and 11 out of 15 medium-sized companies.

Table 11. **Plastic manufacturers – territorial division and company size**

District	Sea	Middle	Small	Micro	Total
M. CHISINAU	13	11	34	144	**202**
M. BĂLȚI		3	5	17	**25**
ATU GAGAUZIA			3	19	**22**
DISTRICT SOROCA				12	**12**
DISTRICT ANENII NOI			2	10	**12**
DISTRICT CAUȘENI				11	**11**
DISTRICT SINGEREI	1		1	6	**8**
DISTRICT STRAȘENI				8	**8**
DISTRICT ORHEI			2	6	**8**
DISTRICT IALOVENI	1			7	**8**
DISTRICT HINCEȘTI			2	6	**8**
DISTRICT UNGHENI	1			6	**7**
DISTRICT CAHUL				7	**7**
DISTRICT FLORESTI				5	**5**
DISTRICT RISCANI			1	3	**4**
DISTRICT CIMIȘLIA			1	3	**4**
DISTRICT CRIULENI			1	3	**4**
DISTRICT CĂLĂRAȘI		1		3	**4**
DISTRICT NISPORENI				4	**4**
DISTRICT TARACLIA				3	**3**
DISTRICT FALEȘTI				3	**3**
DISTRICT TELENEȘTI				3	**3**
DISTRICT GLODENI			1	2	**3**
DISTRICT ȘTEFAN VODA				2	**2**
DISTRICT BASARABEASCA			1	1	**2**
DISTRICT SOLDANEȘTI			1	1	**2**
DISTRICT LEOVA				2	**2**
DISTRICT EDINEȚ				2	**2**
DISTRICT CANTEMIR				1	**1**
DISTRICT DROCHIA				1	**1**
DISTRICT REZINA				1	**1**
Total	**16**	**15**	**55**	**302**	**388**

Source: NBS, 2021

Of the total companies producing plastic products, 78% are micro companies (302 companies), 14% small (55 companies), 4% medium (15 companies), and 4% are large (16 companies) - ***Figure 23.***

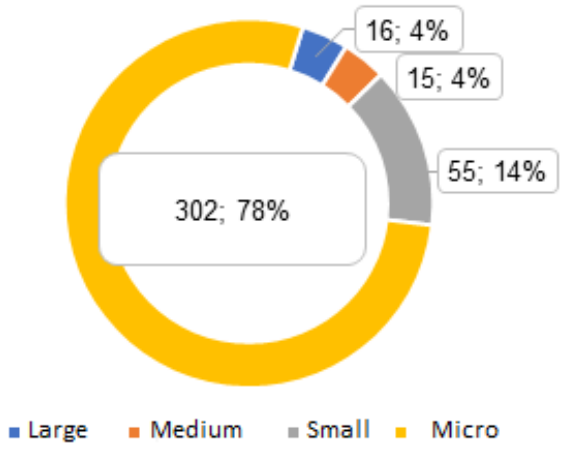


Figure 23. **Manufacturers of plastic products – company size (2021)**
Source: NBS

Only in 2021, according to NBS data**, national plastics producers produced 18 thousand tons of plastics**, of which 60% (11 thousand tons) sold on the national market and another 40% (7 thousand tons) for export.

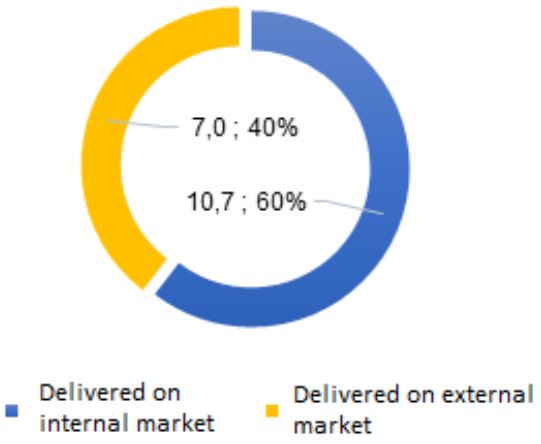


Figure 24. **Distribution plastic products made in the Republic of Moldova**
(Thousand tons)
Source: NBS

Next **Figure 25** shows **the top 10 plastic products made at national level**, of which for domestic use the most significant quantities are for polyethylene bags, bags and cornets, other articles for transport and packaging, and plastic tubes and pipes and for export are plugs, lids and other closures, made of plastics (bottles only).

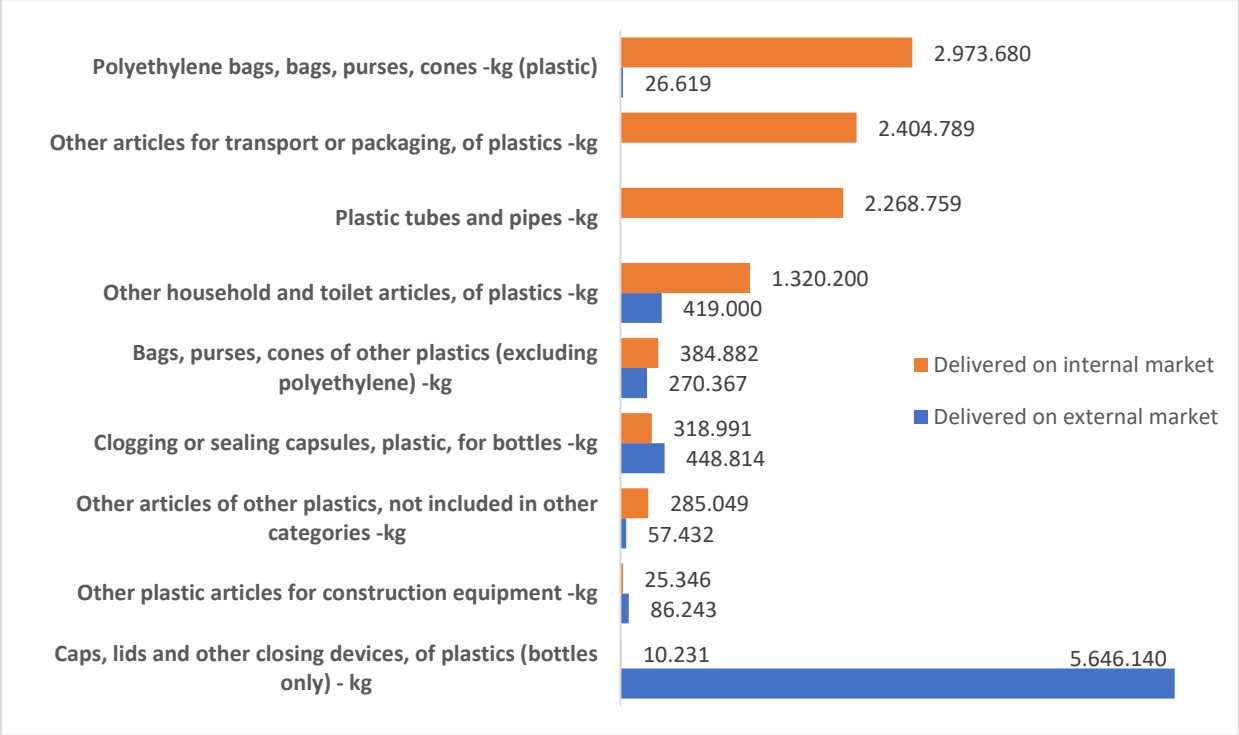


Figure 25. **Top 10 plastic products made in the Republic of Moldova**

Source: NBS

NBS also presents data on the quantity in pieces produced for various plastic products. As an example, Figure 26 shows the evolution over the last 3 years of the quantity of cans, bottles, flasks and similar articles produced. It is noticed that in 2021 their quantity was over 100 million pieces or decreasing compared to the previous year – by almost 10%, and the cause could be the COVID-19 pandemic, this being a global trend.

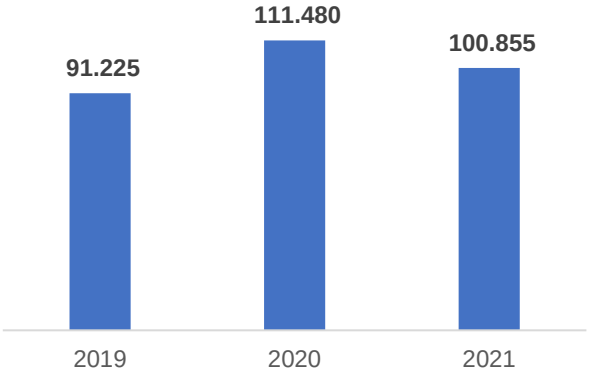


Figure 26. **Cans, bottles, flasks and similar articles of plastics (thousand pcs.)**

Source: NBS

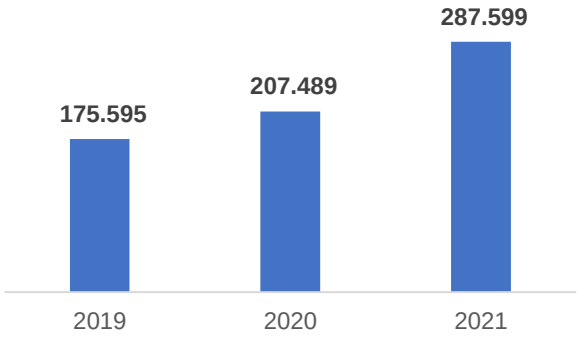


Figure 27. **Windows, doors, stained glass windows and their frames plastic products produced in 2019-2021 (pieces)**

Source: NBS

As shown in **Figure 22,** 69% of plastics manufacturers are engaged in the manufacture of plastic construction products. In this regard, the NBS provides data on the quantities of windows, doors, stained glass windows and their frames made of plastic, which at least in the last 3 years have registered a

steady increase (by 18% in 2020 and by 38% in 2021), as shown in **Figure 27.** More detailed data on plastics products produced at national level is also presented Online Dashboard.

Currently, there are no data sources organized to determine the exact amount of waste generated at national level for each of the 388 national plastic producers according to the CEAM code of activity, nor for all importers of plastic goods. All existing data on the amounts of plastic waste generated and collected at national level are published by the Environment Agency and presented in subchapter 2.2.

Notably, an important step at national level is the approval of the Regulation on packaging and packaging waste and the implementation of the EPR mechanism. For 2023, plastic packaging producers have the obligation to register and report to the Environment Agency the minimum target for recovery through recycling / plastic packaging of 10%. The first official results on EPR implementation and target achievement will be published by the Environment Agency in 2024. So far, in order to achieve this goal, 4 collective systems for implementing extended producer responsibility for packaging waste management have already been authorized by the Environment Agency.

Name of collective system	Packaging type[3]	Access data
Public Association "Association of Packaging Manufacturers and Importers of Moldova"	*15 01 01 packs of paper and paperboard;* ***15 01 02 plastic packaging;*** *15 01 04 metallic packaging;* *15 01 05 packages of composite materials;* *15 01 07 glass packs;*	*https://www.facebook.com/apiam.apiam.9/about*
Eco Save Foundation	*15 01 01 packs of paper and paperboard;* ***15 01 02 plastic packaging;*** *15 01 03 packs of wood;* *15 01 04 metallic packaging;* *15 01 05 packages of composite materials;* *15 01 06 mixed packages;* *15 01 07 glass packs;* *15 01 09 textile packaging;* *15 01 10** packages containing residues of dangerous substances, or contaminated with hazardous substances;* *15 01 11** metal packaging containing a solid porous mould of hazardous materials (e.g. asbestos), including empty containers for pressure storage.*	*https://ecosave.md/*
A.O. Recycling	*15 01 01 packs of paper and paperboard;* ***15 01 02 plastic packaging;*** *15 01 03 packs of wood;* *15 01 04 metallic packaging;* *15 01 07 glass packs.*	*https://rep.md/*
A.O. MoldControl	*15 01 01 packs of paper and paperboard;* ***15 01 02 plastic packaging;*** *15 01 03 packs of wood;* *15 01 04 metallic packaging;* *15 01 05 packages of composite materials;* *15 01 06 mixed packages;* *15 01 07 glass packs;* *15 01 09 textile packaging;* *15 01 10** packages containing residues of dangerous substances or contaminated with dangerous substances.*	*https://www.moldcontrol.md/*

[3] Waste categories according to Government Decision no. 99/2018 on the Waste List

The implementation of the EPR mechanism implies that all packaging producers bear financial and organisational responsibility for managing the waste stage of a product's life cycle. Respectively, each of the producers, part of the collective schemes created, will pay the extended producer responsibility fee to cover the costs of packaging waste management and to contribute to environmental protection. These costs include expenses resulting from the collection, recycling and disposal of packaging waste, as well as education and public awareness programmes. The purpose of this tax is to ensure that producers are responsible for the environmental impact of their waste and to encourage the use of sustainable and recyclable packaging.

According to the provisions of Article 11 of Law no. 1540/1998 on payment for environmental pollution, legal entities, regardless of the type of property and legal form of organization, and individuals carrying out entrepreneurial activity pay the TAX for goods (in this case primary plastic packaging classified under tariff headings: 3923 21 000, 392329 and 392330) which, in the process of use, causes environmental pollution. **According to data provided by the State Tax Service, at least in the last 5 years, taxes for environmental pollution related to plastics worth 1.15 billion lei were paid to the state budget, on average 230 million lei annually.**

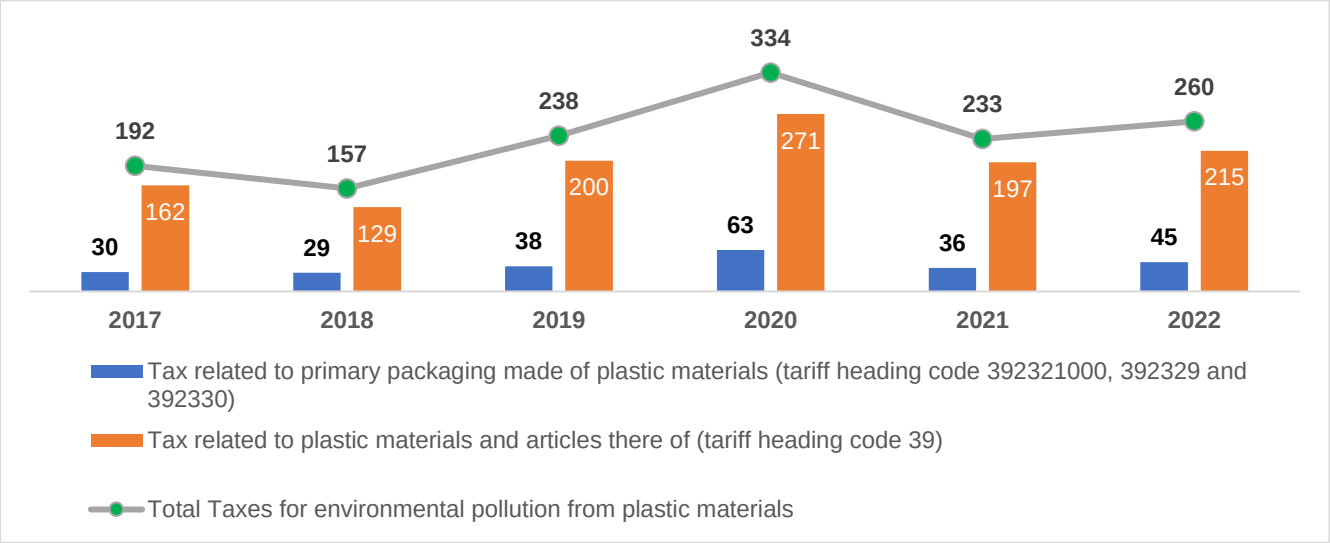


Figure 28. **Fees for environmental pollution from plastics**
Source: SFS. (for 2022 - forecasts)

During the study, no data sources were identified that would confirm the allocation of at least 1% of that amount for actions to prevent plastic pollution, develop infrastructure for separate collection of plastic waste, investments in recycling technologies, etc.

2.2. Current plastic waste management system in the Republic of Moldova

Countries with poor waste management infrastructure typically also have the weakest system for collecting and monitoring data on waste, including plastic, making it difficult to assess how much waste is managed and managed. As a result, we limit ourselves to an incomplete picture of data on plastic waste management at national level. Next, the study presents the current plastic waste management system based on data collected from the Environment Agency and based on the questioning of operators authorized by the Environment Agency for waste collection, transport and recycling activity, including plastic producers.

In the Republic of Moldova, according to the authorizations issued by the Environment Agency, plastic waste management operates **28 operators – usually authorized for several types of activities** *(*

Table *12*).

Table 12. **Authorized operators for collection, transport, treatment, recycling of plastic waste**

No.	Name of operators	Type of authorisation	Treatment	Municipality/ District
1.	Beccara Ltd.	Waste transportation		Anenii Noi
2.	Gelibert Ltd.	Collection, transport and treatment	+	Balti
3.	FinPlast-Prin LTD.	Collection, transport and treatment	+	Balti
4.	Beta-Clean LTD.	Collection and transportation of packaging waste		Cahul
5.	Ecoprodtex LTD.	Collection of waste packaging paper and cardboard, plastic		Causeni
6.	ABS LTD.	Waste collection, transportation, treatment, recycling	+	CHISINAU
7.	Arvi Invest Trading LTD.	Waste transportation		CHISINAU
8.	AutoVoiaj LTD.	Collection, transport, treatment and recycling of plastic waste	+	CHISINAU
9.	Bambus Prim Ltd.	Collection of waste filings and chips of plastics.		CHISINAU
10.	Daconis Ltd.	Collection and transportation of waste		CHISINAU
11.	Eagle Trans LTD.	Waste collection		CHISINAU
12.	KirkLand Group LTD.	Waste collection, transportation		CHISINAU
13.	Moldrec Group LTD.	Waste collection, transportation		CHISINAU
14.	Pandrim LTD. SC	Waste collection, transport, treatment and recycling	+	CHISINAU
15.	PapirCart & Co LTD. SC	Collection of packaging waste		CHISINAU
16.	Proterra Grup LTD.	Collection and transportation of waste		CHISINAU
17.	Queengiada Ltd.	Collection and transportation of waste		CHISINAU
18.	Teodora-Plast LTD.	Collection of packaging waste		CHISINAU
19.	Uispac Ltd.	Temporary storage, processing and marketing of waste		CHISINAU
20.	Uniplast LTD.	Waste collection, transport and treatment	+	CHISINAU
21.	Vladecaprim Ltd.	Collection and transportation of waste		CHISINAU
22.	Wabstech Consulting LTD.	Collection and transportation of waste		CHISINAU
23.	Salubris Grup LTD.	Collection, transport and temporary storage of waste		Criuleni
24.	Nordpromexpo LTD.	Collection, transport and temporary storage of waste		Edinet
25.	Ekonational Distribution LTD.	Collection and transportation of waste		Ialoveni
26.	Nisporeni communal farm JV	Collection, transportation and landfilling of waste		Nisporeni
27.	Evghen-Com Ltd.	Waste collection		Taraclia
28.	Recon Mac Plast Ltd.	Waste collection, transport and treatment	+	Ungheni

Source: Environment Agency

Out of the total 28 analyzed operators, 17 (60%) operate in mun. Chisinau, which currently makes it difficult to properly manage plastic waste in many of the country's localities, especially rural areas. The territorial distribution of authorised operators, including the 8 waste management regions is shown in **Figure no. 29.**

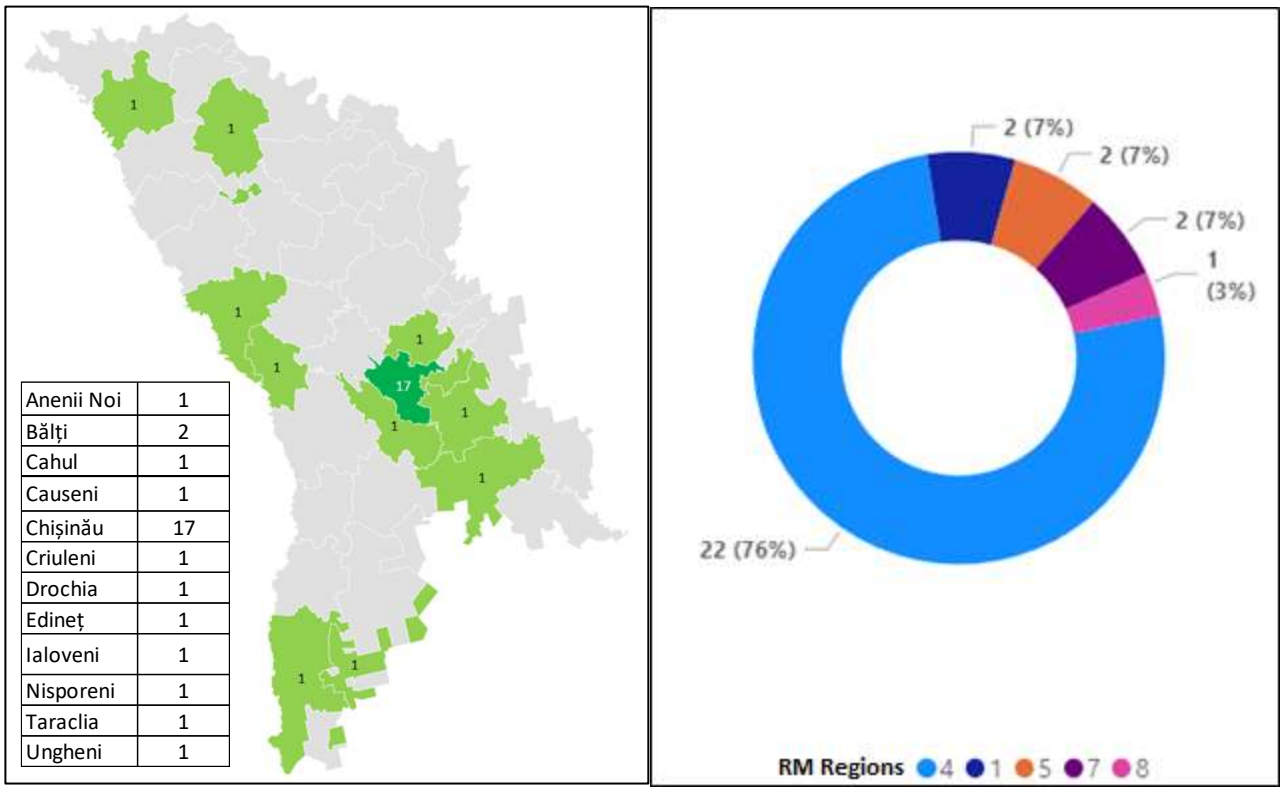


Figure 29. **Map of the Republic of Moldova with authorized operators for collection, transport and recycling of plastic waste – by regions**
Source: Environment Agency

The results from Figure 29 confirm that currently 22 authorized operators (76%) are found as an area of activity in the localities of RMD 4 (mun. Chisinau, Straseni, Ialoveni, Hancesti, Criuleni, Cocieri and Anenii Noi) unlike 2 operators each in RMD 1 (Cahul, Cantemir, Taraclia, Ceadir-Lunga and Vulcanesti), RMD 5 (Calarasi, Nisporeni and Ungheni) and RMD 7 (Balti, Drochia, Riscani, Glodeni, Floresti, Falesti, Singerei and Soroca) and only 1 operator in RMD 8 (Briceni, Ocnita, Edinet and Donduseni). In RMD 2, 3 and 6 there is no operator.

For a more detailed analysis of the current waste management system, the activity of 7 authorized waste management operators was analyzed in order to document the organization of the collection and recycling process of plastic waste, recycling capacities, types of waste subject to recycling and technologies used.

Table 13**. Authorised operators in plastic waste management**

Name of operators	Activity genre	List of wastes for which they are authorised
Gelibert Ltd. www.gelibert.md	• Collection, transport and treatment of packaging waste.	**15 01 02 plastic packaging;**

ABS SRL www.abs.md	• Collection and transportation of packaging waste. • Treatment / Recycling of plastic waste.	15 01 01 packs of paper and paperboard; **15 01 02 plastic packaging;** 15 01 04 metallic packaging; 15 01 07 packs of glass
Salubris Grup SRL	• Collection, transport and temporary storage	20 01 01 paper and paperboard; 20 01 02 bottle; 20 01 11 textiles; 20 01 38 wood; **20 01 39 plastics;** 16 01 03 end-of-life tyres.
Eagle Trans SRL	• Collection of waste paper and cardboard packaging and plastic packaging	15 01 01 packs of paper and paperboard; **15 01 02 plastic packaging.**
Î.M. Regia "Autosalubritate" www.autosalubritate.md	• Collection and transportation of waste.	20 01 01 paper and paperboard; 20 01 02 bottle; 20 01 08 biodegradable kitchen and canteen waste; 20 01 10 clothing; 20 01 11 textiles; **20 01 39 plastics;** 20 02 01 biodegradable waste; 20 03 01 mixed municipal waste; 20 03 02 waste from markets; 20 03 03 residues from street cleaning; 20 03 99 Other unspecified municipal waste.
Autovoiaj SRL www.autovoiaj.md	Collection, transport, treatment of plastic packaging waste and plastic waste.	**02 01 04 - plastic waste** (except packaging); 04 02 09 - wastes from composite materials (impregnated textiles, elastomers, plastomers); **07 02 13 - plastic waste;** **12 01 05 - filings and chips of plastics;** **15 01 02 - plastic packaging;** 17 02 03 - cables other than those mentioned in 17 04 10; **17 04 11 - cables other than those specified in 17 04 10;** **19 12 04 - plastics and rubber;** **20 01 39 – plastics.**
UNIPLAST SRL www.uniplast.md	Waste collection, transportation and treatment.	**02 01 04 Plastic waste** (excluding packaging); **15 01 02 plastic packaging;** **16 01 19 plastics;** **20 01 39 plastics.**

Source: Data published by Environment Agency

The amount of plastic waste collected annually by the analyzed operators varies from 8 tons to 2400 tons. Each of these operators has different collection capacities, infrastructure created for this purpose. At the same time, out of 7 analyzed operators, 4 also practice the activity of plastic waste treatment.

Figure 30. **Quantities of plastic waste collected by authorised operators (tonnes) – year 2021**

Source: According to questionnaires filled in by operators

The most collected type of plastic waste is type 1 - PET and type 4 - LDPE, followed by HDPE, PP and PS. Type 3 (PVC) and type 7 (Other) are less collected due to the difficulty of recycling. As a result, a very diverse category of plastic waste such as (e.g. cigarette filters made of cellulose acetate, plastic beverage bottles, plastic bottle caps, food packaging, plastic food bags, plastic food caps, straws, expanded polystyrene casseroles (containers), etc.) They end up being disposed on landfilling with an impact for several hundred years on the environment and human health.

In the absence of sustainable solutions for these types of waste, it is considered mandatory to impose import restrictions and to transpose as soon as possible at national level the provisions of DIRECTIVE (EU) 2019/904 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 June 2019 on the reduction of the impact of certain plastic products on the environment.

The main source of collection for most types of plastic waste is municipal waste. Only one operator, Uniplast SRL, indicated that it collects waste resulting from agricultural activities (eg greenhouse film). From ***Figure 31*** It is noted that no operator collects plastic construction waste.

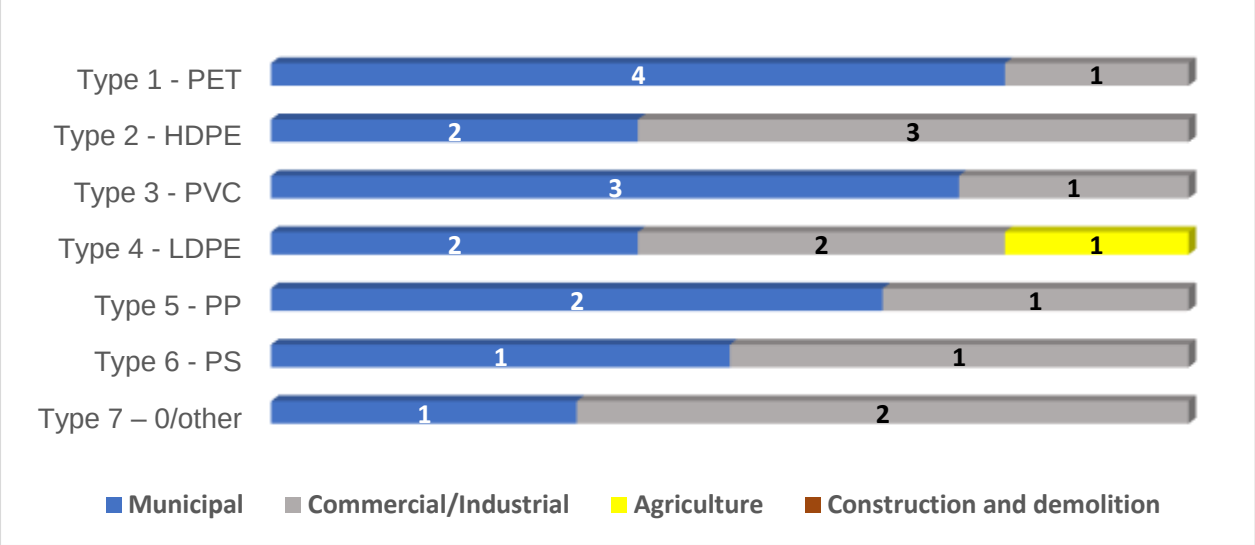


Figure 31. **Main sources of plastic waste collection**

Sura: According to questionnaires filled in by operators

Another important indicator analyzed by the study is the **level of collaboration between authorized operators for recycling plastic waste and plastic producers.**

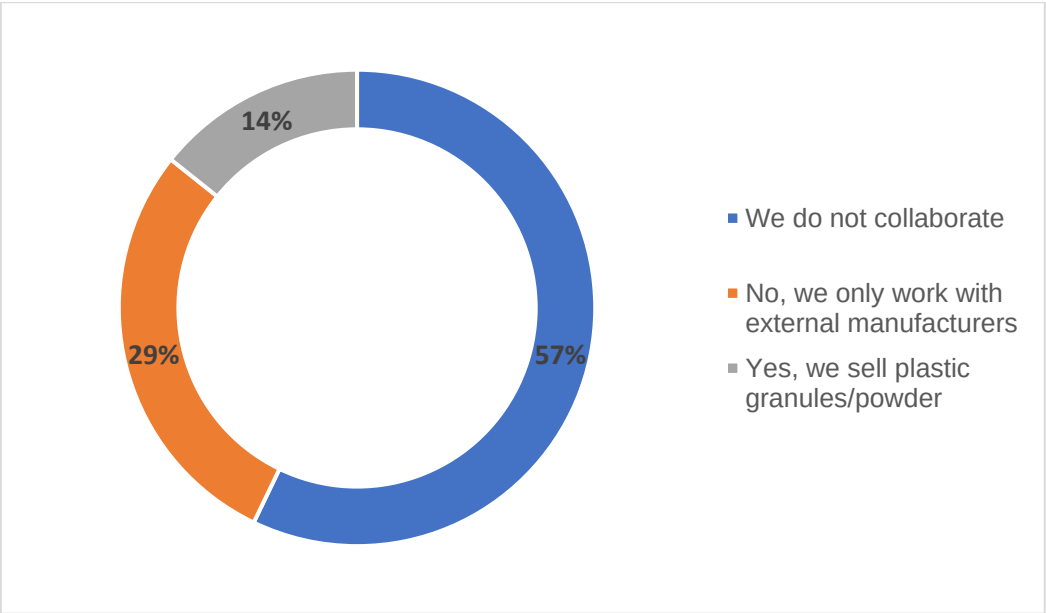


Figure 32. **Cooperation with national producers of plastic products**
Sura: According to questionnaires filled in by operators

The data in **Figure 32** show a result of **86% of interviewed operators** confirming non-cooperation, with all recycled waste exported to external producers and only 14% of respondents selling plastic granules/powder to domestic producers. In the context in which we aim to transition to a circular economic model, it is necessary to improve the communication/cooperation process between plastic producers and authorized recycling operators in order to keep in a closed circuit the secondary raw material resulting from plastic waste recycling, with the possibility to identify and expand the spectrum of its use in various sectors of the national economy.

Box 1.Activity profile authorized operators recycling plastic waste	
ABS SRL	**Uniplast SRL**
	
The company "ABS" SRL has a waste collection network in mun. Chisinau (1500 containers), special vehicles for waste collection, waste sorting plant and production plant. Currently, the company also has the largest capacity to collect, sort and recover plastic waste. In the questionnaire filled in by the company, it is indicated that about 2400	The company "Uniplast" SRL produces polypropylene sewer pipes, recycled polyethylene pipes for irrigation systems and low pressure installations, high-density polyethylene pipes and for food use, fittings and other equipment. Type 2 – HDPE and Type 4 – LDPE plastics are used in the production process.

tons of plastic waste are collected and recovered annually. The main type of activity of the company according to CEAM is E38.32 – Recovery of sorted recyclable materials. For the amount of plastic waste collected, collection, sorting, baling and recycling are ensured. The types of plastic waste collected are Type 1-PET; Type 2 - HDPE; Type 4 - LDPE; Type 5 - PP; Type 6 – PS. The types of plastic waste from the total collected that can NOT be recovered (recycled locally or exported) are Type 3 - PVC; Type 7 – 0/Other. The main source of plastic waste is municipal waste. The company actively cooperates with APL. The company collaborates only with external companies, the collected plastic waste is exported to Romania.	The raw material used is collected and recycled agricultural waste or Category 1 granules are imported. The annual amount of plastic used for production is about 100 tons. Plastic waste resulting from the company's activity is reintroduced into the production process. Currently, the process and technological capacity allow the recycling of 500 tons of polyethylene waste per year. In the last 5 years, the company has changed/improved production processes to minimize environmental impact and streamline resource consumption. Grease capture systems were installed in the area where employees dine, changing the LED lighting system, cleaning the sewage system to avoid bacterial growth, installing motion detectors for areas requiring continuous lighting.

2.3. Reported plastic waste – generated, collected, recovered.

In carrying out the proposed research on the current plastic waste management system, the data published by the Environment Agency for the period 2019-2021 were analyzed, as presented in **Tables 14-16**. These data are reported annually by plastic waste holders (collectors/generators) through the automated information system www.siamd.gov.md[4]

Table 14. **GENERATED plastic waste (2019-2021)**

Waste code	Name of waste	Quantity (tons), 2019	Quantity (tons), 2020	Quantity (tons), 2021
02 01 04	plastic waste (excluding packaging) *(02 – waste from agriculture...)*	7,90	-	-
07 02 13	waste plastics *(07 – wastes from chemical processes...)*	22,74	10,63	7,22
12 01 05	plastic filings and chips	12,10	0,98	180,11
15 01 02	**plastic packaging**	**10786,17**	**269,97**	**499,03**
16 01 19	plastics *(1601 - end-of-life vehicles...)*	25,60	7,23	0,12
17 02 03	plastics (*17 – construction waste...)*	92,43	19,51	12,96
20 01 39	plastics *(2001 – municipal waste, separately collected fractions...)*	1802,93	607,28	251,42
	Total:	**12.749,87**	**915,6**	**950,86**

[4] *In accordance with the provisions of Government Decision no. 501/2018 on the Instruction for keeping records and reporting waste data*

Table 15. **Plastic waste COLLECTED (2019-2021)**

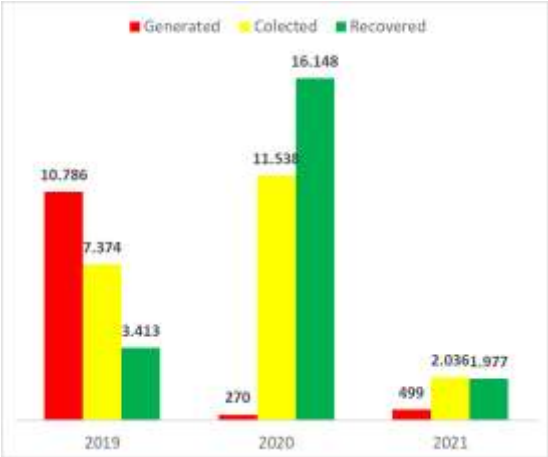
Waste code	Name of waste	Quantity (tons), 2019	Quantity (tons), 2020	Quantity (tons), 2021
02 01 04	plastic waste (excluding packaging) *(02 – waste from agriculture...)*	7,30		
07 02 13	waste plastics *(07 – wastes from chemical processes...)*	1,40		20,10
12 01 05	plastic filings and chips	12,10		
15 01 02	**plastic packaging**	**7373,54**	**11537,92**	**2035,78**
16 01 19	plastics *(1601 - end-of-life vehicles...)*	7,80	160,50	35,0
17 02 03	plastics (*17 – construction waste...)*	92,43		
20 01 39	plastics *(2001 – municipal waste, separately collected fractions...)*	489,83	1541,32	1888,48
	Total:	**7984,4**	**13239,74**	**3979,36**

Table 16. **Plastic waste RECOVERED (2019-2021)**

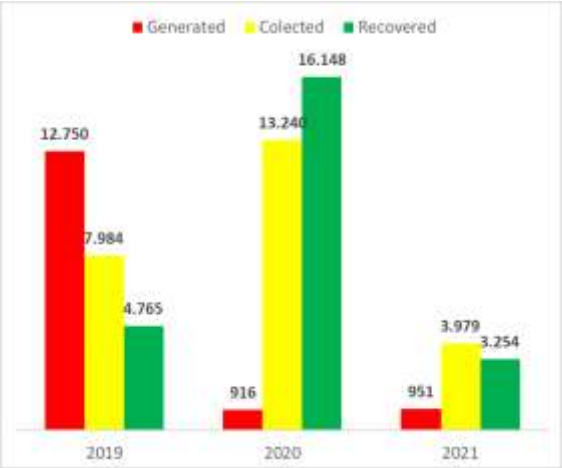
Waste code	Name of waste	Quantity (tons), 2019	Quantity (tons), 2020	Quantity (tons), 2021
02 01 04	plastic waste (excluding packaging) *(02 – waste from agriculture...)*	0,6		
07 02 13	waste plastics *(07 – wastes from chemical processes...)*	21,3		20,1
12 01 05	plastic filings and chips			
15 01 02	**plastic packaging**	**3412,6**	**16148,0**	**1976,9**
16 01 19	plastics *(1601 - end-of-life vehicles...)*	17,8		
17 02 03	plastics (*17 – construction waste...)*			
20 01 39	plastics *(2001 – municipal waste, separately collected fractions...)*	1313,1		1256,7
	Total:	**4765,4**	**16148,0**	**3253,7**

Source: Environment Agency ***2021 - https://am.gov.md/ro/content/gestionarea-de%C8%99eurilor-%C3%AEn-republica-moldova-%C3%AEn-anul-2021-not%C4%83-analitic%C4%83-%C3%AEn-baza-datelor****, 2020-https://am.gov.md/ro/node/672 2019 -* ***https://am.gov.md/ro/node/600***

Figure 33 graphically shows the data from Tables 14-16 for the period 2019-2021 for 2 waste categories "150102: plastic packaging" and "200139: plastics". Data vary considerably for the quantities of waste collected and recovered. In 2020, 11.5 thousand tons of plastic packaging were collected, or up 46% compared to 2019, and in 2021 - 2 thousand tons, almost 6 times less than in 2020. The situation is similar for the recovery of packaging waste (16.14 thousand tons recovered in 2020 compared to 1.97 thousand tons in 2021).



Waste plastic packaging (150102)



Plastic waste from municipal waste (200139)

Figure 33. **Plastic waste generated, collected, recovered: 150102 and 200139 (tonnes)**

Source: Environment Agency

These data variations are argued by the Environment Agency as errors in the reporting process identified especially for the period 2019 and 2020 (e.g. some reporters instead of reporting waste in tonnes showed it in kg, some companies holding the type of activity - production of plastic packaging, erroneously declared Production of plastic waste or errors in declaring stocks held by enterprises, i.e. enterprises often confuse the acronym AP (previous year) declaring, in fact, waste from the reporting year, etc.). For 2021, the reporting process was already a process known to both economic agents and staff validating reports, and more attention was paid to the veracity of the declared data. Thus, according to the Environment Agency, the data for 2021 can be used as a benchmark to make some analyzes to the processes taking place in the field of waste management, ensuring a higher degree of veracity.

Next, the data in Table 17 presents a quantitative analysis of the plastic waste that is generated at national level annually. The analysis is carried out on the basis of statistical data reported by the NBS. According to studies conducted on the assessment of the morphological composition of solid household waste generated in Chisinau and at national level - plastic waste accounts for an average **of 11%**[5] of the total municipal waste generated. This is comparable to the share of plastic waste in the US[6] or EU[7] [8] – which is around 12%, according to the sources analysed. Thus, we can see that in the Republic of Moldova each Moldovan generates an estimated 406 kg of waste per year (2021), of which 45 kg is plastic waste, or **total plastic waste generated at national level of 116 thousand tons.**

Table 17. **Estimate of plastic waste generated in Moldova – per person and total (2016-2021)**

		2016	2017	2018	2019	2020	2021
1	Population*	2.780.744	2.729.634	2.684.772	2.643.675	2.626.585	2.603.813
2	Municipal waste generated, thousand m3*	3.143	3.286	3.176	3.445	3.576	3.520
3	Conversion coefficient**	0,3	0,3	0,3	0,3	0,3	0,3

[5] Study on the assessment of the morphological composition of solid household waste generated in Chisinau municipality, respectively in Causeni and Straseni cities (Year 2016).
[6] https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/plastics-material-specific-data
[7] https://economictimes.indiatimes.com/industry/indl-goods/svs/paper-/-wood-/-glass/-plastic/-marbles/india-wants-to-double-consumption-of-cheap-material-in-5-yrs-what-about-its-plastic-waste/articleshow/59301057.cms
[8] https://ec.europa.eu/eurostat/databrowser/view/env_wasmun/default/table?lang=en

4	Municipal waste generated, thousand tons	943	986	953	1.034	1.073	1.056
5	**Waste generated per capita**	**339**	**361**	**355**	**391**	**408**	**406**
6	Plastic Waste Generated per Capita (11% x 5)	**37**	**40**	**39**	**43**	**45**	**45**
7	**Recovered** plastic waste (thousand tonnes)				**4,76**	**16,15**	**3,25**
8	**Plastic waste generated de facto, thousand tons (1x6)**	**104**	**108**	**105**	**114**	**118**	**116**
9	**Recycling rate**				**4%**	**14%**	**3%**

** SNB date - www.statistica.md*
*** data from the Environment Agency - https://am.gov.md*

The average recycling rate of plastic waste for the last 3 years is 7%, or just 3% for 2021.

There is no detailed morphology of municipal waste at national level, i.e. as a benchmark to understand the composition/types of municipal plastic waste generated, the morphology for Serbia's plastic waste is presented below. The data in Figure 34 also confirm that the largest share of total plastic waste generated belongs to LDPE bags (33.6%), bags that are usually not recycled, being disposed of in landfills. Data on the quantity of plastic (and biodegradable) bags imported into the Republic of Moldova are presented in ***Table 18.*** An equally large share belongs to PET packaging / bottles (28.7%) and HDPE packaging (10.4%) which, unlike LDPE bags, can be and are recycled if they are collected correctly at source or if the necessary infrastructure for collection and sorting is provided.

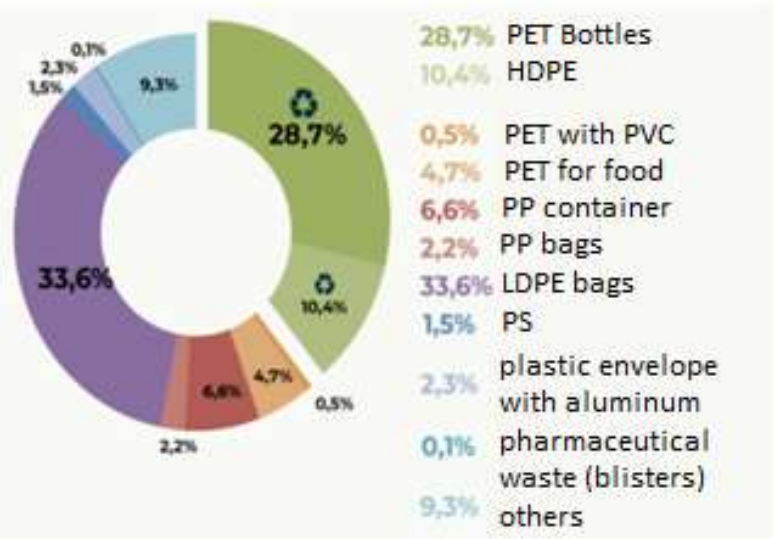


Figure 34. **Plastic waste generated, collected, recovered (tonnes)**
Sursa: Balkan Green Energy News, Serbia-From waste dumps to circular economy, 2022

Table 18. **Quantity of plastic bags (and biodegradable) imported into the Republic of Moldova**

YEAR	WEIGHT (kg)	VALUE (lei)
2018	484.707	38.377.649
2019	506.705	41.641.198
2020	737.059	58.692.815
2021	826.702	74.076.648
2022	569.444	62.871.852

Source: *Information submitted by the Customs Service*

As a first effort to reduce plastic pollution, many governments, including nationwide, have banned conventional plastic bags by law, allowing only the use and production of "biodegradable" bags. According to information from **Table 18**, there is an increase in the quantity of plastic bags imported during the prohibited period (for 3 years) by 500.0 tonnes. The quantity of biodegradable bags imported and used at national level is steadily increasing (**Table 18**), but this result does not entail environmental benefits as the challenges are largely the same for so-called biodegradable options as for fossil-fuel-based plastics. Often, "biodegradable" plastic items (including single-use plastic bags and containers) only completely decompose if exposed to prolonged high temperatures above 50°C (122°F). Such conditions are met in incineration plants, but very rarely in the environment. Therefore, even bioplastics derived from renewable sources (such as maize starch, cassava roots or sugarcane) or from bacterial fermentation of sugar or lipids (PHA34) do not automatically degrade in the environment.

Part of plastic waste is exported abroad by authorised operators. According to international regulations on transboundary waste shipment – operators are obliged to obtain a waste export permit from the Environment Agency. The countries to which plastic waste is exported are Ukraine, Romania, Turkey.

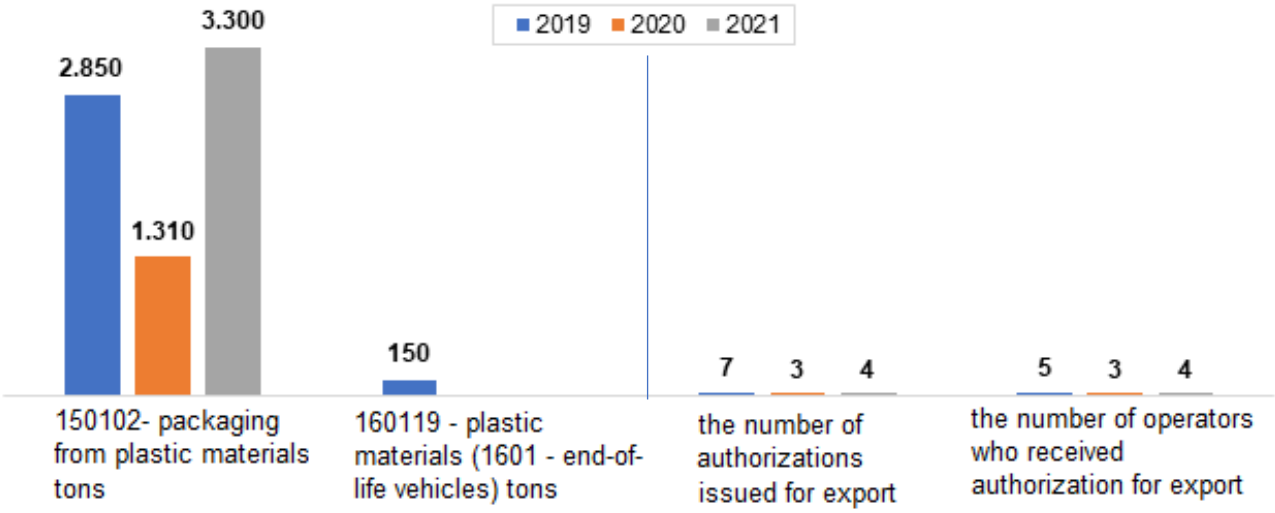


Figure 35. **Quantities of exported plastic waste (tonnes) and number of permits issued (2019-2021)**
Source: Environment Agency

Chapter 3. PLASTIC IN THE CIRCULAR ECONOMY. SOLUTIONS AT NATIONAL LEVEL

3.1. Plastic in the circular economy

Organizations such as the Ellen MacArthur Foundation and the World Economic Forum (WEF) have stressed the importance of properly addressing the full life cycle of plastics, namely to reduce the socio-economic and environmental consequences resulting from the plastic crisis, both globally and nationally, especially for countries that lack the resources, technologies and capabilities to meet these challenges. **We consider that the principles of this approach are also applicable for the Republic of Moldova, respectively they will be the basis for formulating the recommendations set out in subchapter 3.2. and for developing the National Action Plan for reducing plastic waste pollution and implementing circular economy principles.** The research and data analysis activity reflected in this study resulted in the identification **of 3 priority areas of intervention to reduce plastic waste pollution,** which include:

I. **ELIMINATING SINGLE-USE** PLASTICS as an important contribution to reducing plastic pollution by promoting circular approaches that prioritise sustainable and non-toxic reusable products and re-use systems rather than single-use products, aiming primarily at a reduction in litter. The most effective solution in the fight against this waste is **to impose import restrictions.** In this process, it is necessary to define and identify the single-use items that are most likely to be released into the environment, resulting in management challenges when they become waste.

Table 19. **Examples of initiatives to reduce plastic pollution**

Austria	Austria has set minimum targets for waste prevention measures and refill quotas for beverage containers. It is mandatory for every final distributor selling beverages at food retail to offer reusable bottles by 2024 as follows: • at least 60% for beer and mixed beer beverages; • at least 20 % for carbonated water, still water, and soda; • at least 10% for fruit/vegetable juice, nectar, non-alcoholic soft drinks (e.g. lemonades, flavoured waters, energy drinks, iced tea) and milk.
Belgium	In Flanders, from 2020 drinks cannot be served in single-use packaging at public events, including organised by central and local public authorities (unless event organisers can guarantee that 90% will be separately collected for recycling).
Cyprus	Cyprus has transposed all provisions of the Single-Use Plastics Directive, including import bans, EPRs, marking requirements, which refer to the environmental impact of feminine hygiene products, wet wipes, cigarette filters and plastic cups, as well as awareness campaigns on responsible consumer behaviour towards reduction, availability of reuse solutions and environmental impact.
Estonia	In Estonia, there are positive developments regarding consumption and measures to reduce food containers and cups for beverages: • Disposable cups for beverages and food containers may not be provided free of charge to consumers at the point of sale. The price for single-use packaging must not be less than EUR 0.50 and establishments must inform under what conditions reusable containers are accepted; • by the end of 2023, the service facility must offer the consumer the possibility to purchase food and beverages in reusable packaging; • by the end of 2025, the service unit must fully switch to reusable packaging; • From January 1, 2023, any local administrative institution is obliged to ensure that reusable containers and cutlery are used at public events taking place on its administrative territory.
Germany	To reduce plastic consumption, Germany has decided to oblige larger restaurants and take-away establishments (larger than 81 square meters and at least 6 employees) to offer cups and containers for reusable food. Germany has also extended its existing container return system to other single-use beverage containers. From 2022, almost all previously applicable exemptions for the mandatory storage of single-use plastic beverage bottles and packaging will no longer apply. As regards restriction measures, design requirements and marking measures, Germany strictly complies with EU measures. Fines - up to € 10000 were introduced in case of violation of restriction measures.
Greece	In Greece, to encourage reduced plastic consumption, a tax of €0.04 was applied to all plastic cups and food containers from 1 January 2022 and 30% and 60% reduction targets were set for single-use plastic cups and containers for food (by 2024 and 2026 respectively). In addition, there are mandatory requirements for retailers to offer reusable packaging and mandatory discounts for consumers who bring their own reusable packaging. To reduce bottled water consumption, the provision of public water taps has been made mandatory in all sports centres and municipal playgrounds (as of July 2021). As of 2022, marking requirements are applied to all single-use products covered by the Directive, so citizens know which products are intended for reuse, which for recycling and which for composting.
Malta	As regards reducing plastic consumption, it has been proposed to establish a voluntary scheme to incentivise the use of sustainable alternatives, reusable and refill containers for beverages, single-use toiletries in hotels, guesthouses and holiday spaces. By 2022, it has been proposed that students who do not use the food containers and disposable cups offered at educational institutions, as well as customers who choose refill for beverages, will be rewarded with a range of benefits.
New York	In 2015, disposable polystyrene trays (EPS expanded foam) were banned in New York. Shortly after the ban was instituted, the city was sued by a coalition of recycling firms and plastic manufacturers, who argued that polystyrene was recyclable and proposed a recycling plan. The ban was overturned in 2017 following a report by the New York Department of Sanitation that found it was not possible to recycle polystyrene in an economically feasible or environmentally efficient way. The ban applies to all shops selling or offering polystyrene packaging and has been reintroduced with a six-month window for retailers and customers to adapt to the new legislation.

Costa Rica: Total ban on single-use plastic	Costa Rica is an environmental leader in many activities. The country has managed to double its forest area from 26% in 1984 to over 52% in 2017 and intends to be carbon neutral. Government officials pointed out that, despite various successes, "one-fifth of the solid waste produced daily is not collected and ends up in the Costa Rican environment, polluting rivers and beaches." On 5 June 2017, World Environment Day, the government announced a National Strategy to phase out all forms of single-use plastics by 2021 and replace them with biodegradable alternatives within six months. The ban is aimed at eliminating not only plastic bags and bottles, but also other products, such as plastic cutlery, straws, polystyrene containers.
Romania	Ordinance 6/2021 on reducing the impact of certain plastic products on the environment prohibits the placing on the market of single-use plastic products and products made of oxo-degradable plastics. From 3 July 2024, single-use plastic products whose caps and lids are made of plastic may only be placed on the market if the caps and lids remain attached to the containers during the products' intended use stage.
Republic of Moldova	**Internal Trade Act, Article 201.** Retail restrictions 1. It shall be prohibited to use/sell carrier bags made of plastic, with or without handles, with a wall thickness equal to or greater than 50 microns, supplied to consumers at points of sale of goods, as of 1 January 2019. 2. The use/marketing of lightweight plastic bags with a wall thickness of less than 50 microns, except for those used as packaging, shall be prohibited from 1 January 2020. 3. The use/marketing of very lightweight plastic bags with a wall thickness of less than 15 microns, except for those used as packaging, shall be prohibited from 1 January 2021. 4. The use/sale of single-use plates, cups, other table service accessories and chopsticks made of plastic, except biodegradable ones, shall be prohibited from 1 January 2021.

The list of single-use plastic products for which import restrictions are established under Directive (EU) 2019/ of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment (europa.eu) consists of:

1. Cotton buds, except where they fall within the scope of Council Directive 90/385/EEC (1) or Council Directive 93/42/EEC (2).
2. Cutlery (forks, knives, spoons, chopsticks).
3. Plates.
4. Beverage straws, except where they fall within the scope of Directive 90/385/EEC or Directive 93/42/EEC.
5. Beverage stirrers.
6. Sticks to be attached to or to support balloons, except balloons for industrial or other professional uses and applications, which are not distributed to consumers, including the mechanisms of such sticks.
7. Food containers, made of expanded polystyrene, such as boxes with or without lids, used to contain food which: (a) is intended for immediate consumption, either on-the-spot or take-away; (b) are normally consumed from the container; and (c) are ready for consumption without further preparation such as cooking, boiling or heating, including food containers used for fast food or other meals ready for immediate consumption, excluding beverage containers, plates, packets and wrappers of flexible material containing the food.
8. Beverage containers made of expanded polystyrene, including their caps and lids.

In addition to transposing this Directive, Commission guidance on single-use plastic products under Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment has also been published

II. CIRCULAR BUSINESS MODELS, based on designing plastic products to be reusable, recyclable or compostable. It is also crucial to ensure synergy with and between important plastic-using sectors such as agriculture, construction, tourism, retail, etc.

Table 20. **Key economic sectors to implement circular business models for plastic products**

Construction sector 	In Europe, the construction sector uses around 10 million tonnes of plastics every year, which constitutes around 9% of total plastic consumption in Europe. It is the second largest plastics consumer sector, after the packaging sector. Although plastic is not always visible in buildings, it is widely used in insulation, pipes, window frames and decorations. The rate of reuse and recycling is minimal, as plastics are often tightly integrated with other types of materials. They can also contain harmful substances, especially if buildings are old.
Agriculture 	Agriculture uses major amounts of plastics. In particular, farmers use plastic wrap to maintain soil moisture and protect against pests. If plastic film waste is not collected separately and handed over to operators for recycling, it poses an increased environmental risk or, in many cases, ends up incinerated. A total of 80,000 t/year is placed on the European market. The main problem of this product is its recovery at the end of its shelf life, as the resulting waste is highly contaminated with between 30% and 70% improper waste, such as soil, stones and crop residues. The use of compostable plastics in these types of applications is therefore a solution of great interest.
Hospitality and tourism industry 	In the hospitality and tourism industry, consumption of single-use plastics is high and recycling levels are low. For example, festivals and concerts have a high consumption of single-use plastics that often end up in nature or on the streets. In addition, the entire takeaway sector is growing, leading to greater consumption of packaging that is not collected separately, and therefore ends up incinerated or disposed of in landfilling.
Retail trade 	In retail, large quantities of plastics are used along the entire value chain, including packaging for transport and packaging of goods themselves, etc. There are many opportunities to change what is already a habit to reduce consumption and stimulate recycling. Some large companies in the sector have initiated initiatives, for example by discontinuing the sale of certain plastic items.
Electrical/electronic equipment 	Currently, most electrical/electronic equipment (WEEE) is not designed to be recycled, much less circular. The plastics in these products account for around 20% and, through better design, significant environmental and financial savings could be achieved. For example, using recycled plastic in an electrical/electronic product could reduce the environmental impact of a single product by more than 20%. If all waste plastic and electrical and electronic equipment (WEEE) in Europe were recycled, estimated CO2 emission reductions would be more than 2.5 million metric tons per year. Annual demand for plastic in Europe is 52 million tonnes, of which plastics used in electrical and electronic products account for 6.2%. Combined with the automotive industry, these two sectors use almost 16.3% of plastics, which equates to 8.5 million tonnes per year. According to estimates, the reuse of post-consumer recycled plastics in WEEE is estimated to be below 1% (DRC Environment 2017). Instead of WEEE (Waste Electrical and Electronic Equipment), we should focus on the development of CEEE: Circular Electrical and Electronic Equipment.
Textile sector 	Almost 70% of all clothes on the planet are made of plastic. The development of new textiles such as polyester and nylon facilitated the development of "fast fashion", which encouraged consumerism. In 2020, the world needed 59.7 million tonnes of fossil-based virgin fibres to meet textile needs. With a production volume of 57 million tonnes, polyester was the most widely used fibre, accounting for 52% of the global fibre market in 2020, and polyamide (nylon) had a market share of 5%. By 2030, global fiber demand is expected to be 135 million tonnes annually, with more than 75% from synthetic materials. The average consumer buys 60% more garments each year, but only uses them 50% of the time compared to 15 years ago.

Extended Producer Responsibility schemes and the use of the Deposit System are recognised as the most effective mechanisms to support the creation of a circular economy. They improve recycling rates, reduce the amount of waste landfilled and create the conditions to reduce waste management

costs. The financial responsibility of producers in the plastics value chain to pay all costs related to product use, disposal, collection (including litter, provision of street bins and street sweeping) and processing makes a significant contribution to achieving the proposed objectives. More recently, cost-effective EPR ecomodulation can ensure value chains deliver greener products designed to be reusable and more easily recyclable.

Last but not least, to accelerate the transition to a circular economy, economic and fiscal incentives need to be applied, which would allow for a greater recovery of value, including stricter control of toxic substances, including additives. Measures are also needed to support the extension of product lifetime, the incorporation of recycled content, the redefinition of waste as a resource and support the reduction of waste generated.

Annex no.2 to this Study presents a list of circular business models/solutions to reduce plastic pollution. Each of these models confirms, on the one hand, the role of innovation, education and legal regulations in identifying the most appropriate solutions to stop plastic pollution, and on the other hand, priority directions (business) to be supported including financially (subsidies, financing programs, tax exemption) at national level in the next period. Of course, supporting the transition to a more circular plastics economy also requires innovation to influence change in the design, collection and recovery phases. The transition will not be immediate – it will take time to influence change. Recognising that industry often needs support to build momentum and help implement circular business models requires the use of economic incentives.

III. **RESEARCH AND INNOVATIONS** for circular business models. A number of comprehensive interventions have already been identified that can support the transition to a circular economy. Circular economy policies, such as extended producer responsibility (EPR) schemes, can encourage innovation in plastic waste recycling. However, innovation in plastic waste prevention and recycling remains limited, accounting for only 1.2% of all plastics innovations in 2017 – largely unchanged since 1990 (1.1%). Much more ambitious policies are needed to direct technological change towards closing plastic loops and reducing leakage into the environment.

Innovation in environmentally relevant plastics technologies has evolved rapidly over the past 30 years. The total number of patents increased by a factor of 3.4 between 1990 and 2017. Patented technologies for plastics prevention and recycling form the largest group and have grown the most – by a factor of 4. In comparison, new technologies for bio-based raw materials and for transforming, eliminating or eliminating plastic waste leakage increased by a factor of three.

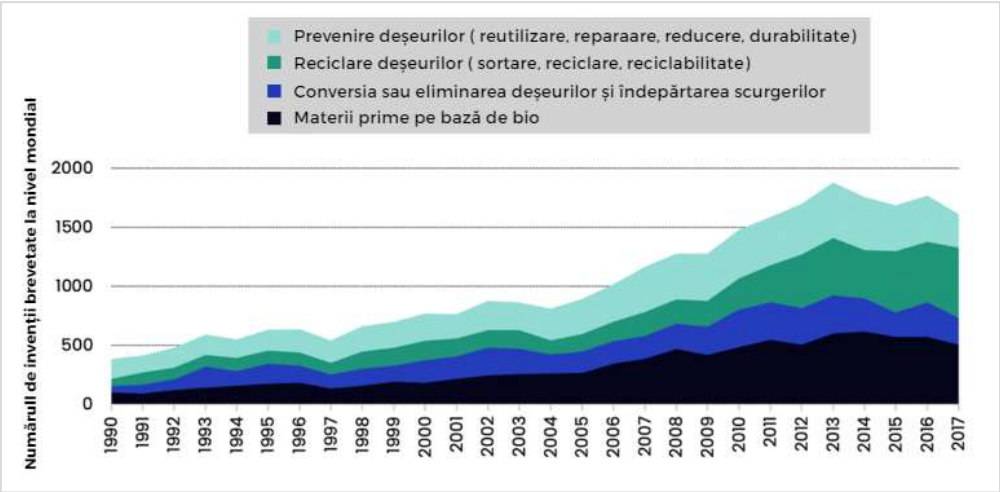


Figure 36. **Worldwide patented inventions in environmentally relevant plastic technologies, 1990-2017**

Sursa: „Global Plastics Outlook: Economic Drivers, Environmental Impacts and Policy Options"

Integrating the circular economy into existing business models would reduce costs and address the negative impact of plastic. Research has shown that this approach could reduce annual volumes of plastic entering the oceans by 80% and GHG emissions from plastic by 25%, while promoting the creation of more jobs and better working conditions. It is estimated that integrating the circular economy by 2040 could create 700,000 jobs along the plastic value chain. An increase in the value of plastics by design for recycling can also lead to significant improvements in working conditions and earnings for waste management workers. However, progress in implementing these approaches has been slow due to inappropriate incentives for both authorities and industry. Overhauling the systems needed to address the plastic crisis can be extremely costly and complicated, especially for countries that do not have complex waste management systems. A substantial shift in investment for virgin plastic towards recycled plastic is needed.

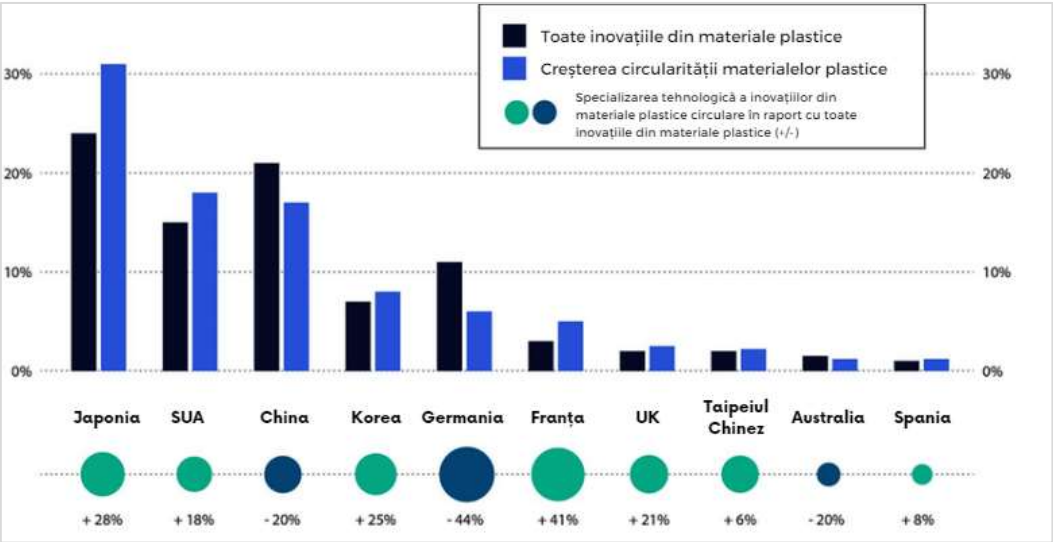


Figure 37. **Top ten innovative countries in plastics prevention and recycling innovations, global share 2010-2014**

Sursa: „Global Plastics Outlook: Economic Drivers, Environmental Impacts and Policy Options"

Figure 37 It shows the top ten innovative countries and compares their global share in patented inventions for the prevention and recycling of plastics. Not surprisingly, countries that innovate in plastics also tend to innovate in plastics circularity technologies. However, some countries are investing more in plastics prevention and recycling technologies. For example, between 2010 and 2014, France, Japan, Korea, the United Kingdom and the United States invested more in innovations about the circularity of plastics. While countries such as Germany, China and Australia have been relatively less focused on the circularity of plastics. However, due to the large number of plastic-related innovations, these three countries are leaders when considering the absolute number of circular plastics patents. In addition, the focus on circular plastic technologies is expected to increase in several countries. For example, a total waste export ban will come into effect in Australia by mid-2024 and significantly increase domestic demand for plastic recycling. Growing Australian market, also supported by AUD 190 million public investment[9] In modernising recycling, it will stimulate innovation in plastic waste recycling. This high concentration of innovations in plastics prevention and recycling highlights the need to accelerate the international transfer of these technologies to developing countries, where plastic use and plastic pollution problems are growing rapidly.

[9] Australian dollar

3.2. Recommendations to reduce plastic pollution

Currently, it is estimated that annually only 3% of plastic waste generated at national level ends up being recycled. This result is a very worrying one with gloomy prognosis in the absence of urgent intervention from central and local public authorities, industry, academia, civil society, etc. Next, we intend that the data analyzed and presented in this study, funded with the support of the GEF SGP Moldova Small Grants Program, implemented by UNDP, will serve the Ministry of Environment in developing a **National Action Plan to reduce plastic waste pollution and implement circular economy principles.** The basis for the elaboration of this Plan will be the most important provisions of the European normative acts (the synthesis of the European normative framework is presented in subchapter 1.4) and the national legal framework, including the provisions of **the National Program for Waste Management for 2022-2027 (PNGD), developed during 2021-2023**[10]. In line with this plan, central authorities consider it necessary to take measures to reduce plastic waste and recover its economic value at the expense of high costs resulting from disposal and non-compliant combustion.

A zero waste action plan does not mean zero plastic. It means reducing plastic waste and improving the lifecycle management of plastics to achieve a more circular plastics economy. This process involves effort from all key actors that can influence the design of a plastic product/packaging with recycled content, it means that the EPR mechanism works, respectively that there are suitable systems for the recovery of plastic packaging, etc. Next, starting from the 3 priority areas of intervention to reduce plastic waste pollution described in subchapter 3.1, a series of recommendations proposed for examination by competent authorities and which can be found in **the National Action Plan for reducing plastic waste pollution and implementing circular economy principles are presented.**

RECOMMENDATION 1. REDUCTION/ELIMINATION OF SINGLE-USE PLASTICS

- Conducting a national audit for UPPPs and establishing the list of UPPPs for which prohibition, substitution, etc. measures will be applied, including mandatory records of importers, manufacturers and distributors of PPUF;
- Establishing the import ban for plastic products with an impact on the environment and not subject to recycling, also provided for in DIRECTIVE (EU) 2019/904 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 June 2019 on the reduction of the impact of certain plastic products on the environment;
- Set a % target to reduce single-use packaging for food, beverages, e-commerce and household care products. A gradual reduction of 50% by 2030 is proposed;
- Promoting and facilitating alternative and sustainable products through eco-innovation and ecodesign to replace UPPPs;
- Encouraging online retailers to offer customers the possibility to opt out of delivering products in additional packaging (for shipping) when their own packaging of products is already suitable for shipping;
- Ban the use of single-use beverage packaging at least for events organised by central and local public authorities (unless event organisers can guarantee that 90% will be separately collected for recycling);

[10] The PNGD is in the process of consultation

- Prohibition of the use of PET bottles in events (conferences, seminars, etc.) organized at least by public institutions. It is proposed to replace them with glass packaging;
- Endowment of all educational institutions and state institutions (APC, APL1/2) with water refilling systems or drinking wells[1] to supply pupils, students and staff, employees with drinking water. This will significantly reduce the use of single-use PET bottles.

RECOMMENDATION 2. PROMOTING THE CONCEPT OF REDUCE/REUSE

- Introducing the concept of prevention / reuse in the Regulation on packaging waste management approved by H.G. no. 561/2020;
- Set a fee for single-use packaging (e.g. 0.20 euro Latte per unit) that is visible to each user. The revenues resulting from the collection of such charges could be used to support innovative re-use systems;
- Setting % targets for refilling for final distributors selling beverages to food retailers to offer reusable bottles. Beverage type targets will be set (e.g. at least 10% for fruit/vegetable juice, nectar, non-alcoholic soft drinks (e.g. lemonades, flavoured waters, energy drinks, iced tea and milk);
- Encourage refillable packaging alternatives to be available by any restaurant, café or store selling food or beverages to be consumed "on the go";
- Encouraging or obliging retailers selling non-hazardous food, beverages and cleaning products to accept consumers to bring their own container (properly washed container);
- Encourage reusable materials through tax incentives. Tax exemption/reductions for producers implementing re-use schemes as measures to prevent environmental pollution.

RECOMMENDATION 3. IMPLEMENTATION OF REP SCHEME AND DEPOSIT SYSTEM FOR PLASTIC PACKAGING

- Introduction of differentiated deposit schemes for single-use packaging and reusable packaging. It is recommended to clarify exactly how deposit systems work in both cases and to come up with additions to the definition of reusable packaging;
- Elaboration and publication of the list of packaging for which the deposit system must apply;
- Financial incentives from the statute for the development/improvement of EPR schemes (e.g. infrastructure expansion, information campaigns);
- Improving the register of packaging placed on the market by producers registered on the www.siamd.gov.md portal. Through this portal, the Environment Agency can provide a realistic database for planning the investments needed to meet the recycling targets that the Republic of Moldova has set by Government Decision no. 561/2020;
- Apply tools for regular monitoring of EPR implementation to avoid non-compliant actions or lack of action by collective schemes created in the process of plastic packaging waste management;
- Implement the modular REP fee per type of packaging to stimulate higher recycling rates (e.g. the EPR fee must be higher for packaging that cannot be recycled or reused);
- Create a fund among the collective system where at least 5% of EPR fees collected are invested in prevention and reuse systems;

- A major obstacle to the development of waste collection infrastructure (including plastic packaging) is the lack / shortage of locations for the location of separate collection points or collection centers for recyclable waste. It should be mandated by law for local waste management plans to be harmonised with spatial plans (town plans) to ensure that they clearly allocate the locations necessary for the successful implementation of the local waste management plan;
- Setting plastic waste recycling objectives/targets for local authorities and encouraging them to share responsibilities with packaging producers/collective systems representing these producers *(applicable for LPAs part of waste management regions where sorting and recycling utilities will be built);*
- Establish legal obligations for packaging distributors (including plastic) to equip commercial premises with bins/RVM systems and work with authorized collective systems to achieve recycling targets.

RECOMMENDATION 4. EDUCATION, RESEARCH AND INNOVATION

- Improving knowledge and practices for plastics and plastic waste management in educational institutions*;*
- Conducting research/studies to facilitate the identification and implementation of circular solutions/eco-friendly alternatives to current plastic packaging (e.g. bio-plastics, resin-infused paper and packaging materials based on natural fibers, etc.).

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Annex 1. Types of plastic

To use carefully
PET or PETE (Polyethylene terephthalate) (type 1) – represents disposable containers. They can release heavy metals that affect hormonal balance. PET is probably the most widely used type of packaging for selling plain water. But many other types of packaging are made of this material. Precisely because repeated use of this type of packaging increases the risk of harmful substances and increasing the number of bacteria, PET packaging should not be reused.

Sure
HDP or HDPE (High Density Polyethylene) (Type 2) – is probably the safest type of packaging. It is a plastic that releases practically no chemicals. Experts recommend choosing this type of packaging when purchasing still water, being probably the healthiest option available on the market. HDPE is a rigid plastic used mainly in packaging for milk and natural juices, liquid detergents, chlorides, oils, corks, glasses, canisters (barrels), ice boxes, bowls, food boxes and toys.

To avoid
PVC or V (Polyvinyl chloride) (type 3) – is a packaging variant not recommended for products intended for human consumption, given that it can release two toxins causing hormonal diseases. PVC is a softer, slightly flexible material. As a rule, food foils, oil bottles, blisters for medicines, and many other products are made from it. Due to its low cost, it is an economical type of packaging.

Sure
LDPE (Low density polyethylene) (type 4) – is used in the production of bags, nets and household bags. Given that this type of material does not release harmful chemicals, lately new uses have been found even in the production of furniture and clothes. It is also found in the packaging of cosmetics and hygiene products, such as tubes (toothpaste, cleansers, creams), pharmaceutical bottles, storage bags, food packaging foil, glasses, bowls or flexible toys.

Sure
PP (Polypropylene) (Type 5) – a type of white or semi-transparent plastic used for packaging yoghurts, juices, cereal boxes, disposable diapers, buckets, casseroles, bottle stoppers and boxes for margarine and yogurt. It is a rigid but light material, with a special thermal resistance. Provides a barrier to moisture, chemicals and grease. It is used in opaque or semi-opaque containers, such as some bottles, bowls, drinking straws, some yogurt boxes, cosmetics and bottles (if you really want to use plastic baby bottles, this type of plastic is recommended).

To avoid
PS (Polystyrene) (Type 6) – although it is often used in the food packaging industry, it is another hazardous material as it releases carcinogenic chemicals such as styrene. Coffee cups, juices, casseroles for fast food (shell-type packaging) are made from it. Many fast food packaging is made of PS, due to the fact that it is a good heat insulator, not allowing food to cool or cold juices to heat up. It is also known as "styrofoam" (polystyrene foam). In construction it is often used as a thermal insulator (expanded or extruded), but also for egg packaging and for wrapping household electrical products for safe transportation.

To use carefully
PC (polycarbonate) or unlabeled plastic (type 7) – is the most dangerous type of plastic food packaging, can eliminate BPA (bisphenol A) and is often used in the production of sports water bottles, food containers and, unfortunately, even infant bottles. This category has been designed to include both polycarbonate and other plastics, so recycling and reuse of this category of packaging is not standardized.

Annex 2. Circular business models

No.	Business models	Circular products
	Phario – wastewater bioplastic Use of microorganisms and bacteria from wastewater for the production of PHA bioplastics, turning domestic wastewater into a source of raw material. If these bacteria are fed enough under the right conditions, they convert up to 40-50% of their weight into PHAs bioplastics. This plastic has very good thermal and mechanical properties, which makes it suitable for all types of applications. It is also biodegradable and, more importantly, scalable globally, as most classic wastewater treatment plants can implement the same processes.	
1.	**SPRITE Company** The transition from green to transparent bottles facilitates their recycling. Empty colourless bottles are sold at a price of 85 euro/tonne or 35% more compared to coloured bottles.	
2.	**DANONE** has removed more than 1.6 million labels in Indonesia alone. The barcode is printed on the lid, which in turn is made of recycled material. The example has already been taken up by France.	
3.	**EVERDROP** Concentrated cleansing pills have been designed to be dissolvable in water and 100% recyclable bottles. This business model (1 euro per pill) is much more advantageous, with lower costs for transport, etc.	
4.	**Nestlé in 2020, parent company of pet food brand Purina, launched a single-material PP bag. This recyclability effort is part of Nestlé's commitment to have all packaging recyclable or reusable by 2025.**	
5.	**Henkel** In line with its packaging targets and commitment to avoiding plastic waste, Henkel has transformed its entire portfolio of Oral Care tubes into fully recyclable tubes produced by its packaging supplier Albéa.	

No.	Business models	Circular products
7.	**Henkel** In November 2020, the Authentic Beauty Concept brand launched the first refill bar station on the European market. The consultant provides a personal and professional consultation about the hair care routine and wishes of the client, then recommends the right product. Using the refilling station, a recycled plastic bottle is filled with the necessary product. Once the customer has finished using the product, the empty bottle can be brought back to the salon to be refilled.	
8.	**Neopac** reduced the amount of ethylene-alcohol vinyl copolymer and lamination adhesive below 4% and 1% of the total packaging. With this design, Neopac also limited the use of ink so as not to affect the recyclability of the product. With this new design of a laminated PE tube, Neopac demonstrates that it is possible to develop PE tubes fully compatible with current HDPE recycling requirements.	
9.	**Gualapack** decided to design a bag containing more than 95% PP and less than 1% ethylene-vinyl alcohol copolymer. This proves that it is possible to design a single-material bag made of PP.	
10.	**Mushroom-based packaging** It uses fungicide mycelium to digest agricultural waste such as corn stalks and grow amazing materials that replace PS (polystyrene) packaging today. • The raw material can be poured into any desired form, dried and used as packaging. • It biodegrades at an incredible rate, including in home conditions.	
11.	**Invisible packaging** It consists of protective peel made of fruit materials, which is added to the surface of fresh produce to slow down water loss and oxidation – the main causes of damage.	

No.	Business models	Circular products
12.	**Cardboard alternatives made from grass waste** Cardboard made from grass waste is suitable for packaging fruits and vegetables. • The manufacturing process consumes less energy; • Reduced CO2 emissions (by 25% compared to cardboard based on virgin fibers and recycled); • Significant reduction in water consumption (about 3 m³ less water per ton of cardboard).	
13.	ABP Ireland ABP Ireland succeeded in removing PVC in All retail food packaging and substitution with PET material, having no negative effect on the quality of meat products or shelf life.	
14.	**LUSH** LUSH has redesigned some of its liquid personal care products to be sold in solid form. Its "naked" range includes shampoo, conditioner, body gel, toner and deodorant. Currently, around 65% of the LUSH product range is without plastic packaging. Since 2005, globally LUSH has sold nearly 50 million solid shampoo products, eliminating over 150 million plastic shampoo bottles. They also reduced packaging by creating the LUSH Labs app, which allows customers to access product information such as ingredients or instructions for use, eliminating the need for labeling and packaging.	
15.	**IBEROSTAR** In 2020, the IBEROSTAR hotel network gave up single-use plastic. Disposable care items (shampoo, shower gel, cream) previously offered to customers have been replaced with dispensers made of recycled plastic. And toothbrushes, combs, shower hats and razors have been replaced with items made from compostable or biodegradable materials. Plastic water bottles have been replaced with water fountains and reusable bottles. Plastic laundry bags were replaced with cloth ones.	
16.	AGRO+ Project **Replacing agricultural plastic film (e.g. greenhouses) with compostable/biodegradable plastics EN 17033** This project develops a pilot methodology to stimulate the use of compostable films and propose a waste management protocol for turning them into compost that can be reused by farmers for their own agricultural production**.**	 

No.	Business models	Circular products
17.	Carrefour Carrefour has eliminated packaging for fruit and vegetables. The decision was taken following a consultation with consumers in which customers cited fruit and vegetable packaging as the main irritant when entering Carrefour stores. As a result, Carrefour avoided 700 tonnes of plastic per year. Carrefour has so far eliminated 80% of fruit and vegetable packaging.	
18.	BOLLE BLU (Moldova) An important advantage of the bulk system is that it reduces waste and plastic production. The store encourages responsible consumption by allowing you to buy less product, very useful especially if you want to be sure first that it suits you with the possibility of returning / reusing packaging.	
19.	MyEco.md In 2021, a REFILL station for ECOVER products appeared in the store. As a result, the consumer pays only for the product and not for the bottle.	

Annex 3. Dashboard - Plastic Waste Study

All data analysed by this study are published and accessible on an Interactive Dashboard which can be accessed at
https://app.powerbi.com/view?r=eyJrIjoiZDQ3Yjc2N2EtYjY5NC00YmYwLWJlOWQtOTJlMGE1ZjA2NTY4IiwidCI6ImIzMGVmNjRkLTUzNzgtNDkwMC1hNjgwLWMxMjJhM2JjZTk1NiIsImMiOjh9

Annex 4. Combined Commodity Nomenclature: Plastics and articles of plastics**.**

Tariff position code	Description of goods	Unit of measurement	Customs duty on import,%
	I. PRIMARY FORMS		
3901	**Ethylene polymers, in primary forms:**		
3901 10	– Polyethylene with density below 0.94:		
3901 10 100	– – Linear polyethylene	—	1
3901 10 900	—Others	—	5
3901 20	– Polyethylene with a density of 0,94 or more:		
3901 20 100	– – Polyethylene in one of the forms referred to in Note 6(b) to the Chapter with a density of 0,958 or more at 23 °C, containing: — not more than 50 mg/kg aluminium;— not more than 2 mg/kg calcium;— not more than 2 mg/kg chromium;— not more than 2 mg/kg iron;— not more than 2 mg/kg nickel;— not more than 2 mg/kg titanium;— not more than 8 mg/kg vanadium, for the manufacture of chlorosulfonated polyethylene	—	5
3901 20 900	—Others	—	1
3901 30 000	– Copolymers of ethylene and vinyl acetate	—	5
3901 40 000	– Ethylene-alpha-olefin copolymers, having a relative density below 0,94	—	5
3901 90	–Others:		
3901 90 300	– – Ionomer resin consisting of a salt of an ethylene terpolymer with isobutyl acrylate and methacrylic acid; polystyrene copolymer of block type A-B-A, copolymer of ethylene-butylene and polystyrene,		
	containing by weight not more than 35 % of styrene in one of the forms referred to in Note 6 (b) to the Chapter	—	5
3901 90 800	—Others	—	5
3902	**Polymers of propylene or other olefins, in primary forms:**		
3902 10 000	–Polypropylene	—	5
3902 20 000	– Poliizobutilenă	—	5
3902 30 000	– Propylene copolymers	—	1
3902 90	–Others:		
3902 90 100	– – A-B-A block polystyrene copolymer, ethylene-butylene and polystyrene copolymer, containing by weight not more than 35% styrene, in one of the forms referred to in Note 6(b) to the Chapter	—	5
3902 90 200	– – Poly-1-butene, a copolymer of 1-butene with ethylene containing by weight not more than 10 % ethylene, or a mixture of poly-1-butene with polyethylene and/or polypropylene containing by weight not more than 10 % of polyethylene and/or not more than 25 % polypropylene, in one of the forms referred to in Note 6(b) to the Chapter	—	5
3902 90 900	—Others	—	5
3903	**Styrene polymers, in primary forms:**		
	–Polystyrene:		
3903 11 000	—Expandable	—	5

Tariff position code	Description of goods	Unit of measurement	Customs duty on import,%
3903 19 000	—Others	—	1
3903 20 000	– Styrene-acrylonitrile (SAN) copolymers	—	5
3903 30 000	– Copolymers of acrylonitrile-butadiene-styrene (ABS)	—	5
3903 90	–Others:		
3903 90 100	– – Copolymer of styrene with allyl alcohol only, with an acetyl value of 175 or more	—	5
3903 90 200	– – Brominated polystyrene, containing by weight 58% or more but not more than 71% of bromine, in one of the forms	—	5
	referred to in Note 6(b) to the Chapter		
3903 90 900	—Others	—	5
3904	**Polymers of vinyl chloride or other halogenated olefins, in primary forms:**		
3904 10 000	– Poly(vinyl chloride), not mixed with other substances	—	1
	– Other poly(vinyl chloride):		
3904 21 000	– – Neplastifiată	—	5
3904 22 000	– – Plasticized	—	5
3904 30 000	– Vinyl chloride and vinyl acetate copolymers	—	5
3904 40 000	– Other vinyl chloride copolymers	—	5
3904 50	– Vinylidene chloride polymers:		
3904 50 100	– – Copolymer of vinylidene chloride with acrylonitrile, in the form of expandable balls with a diameter of 4 microns or more but not more than 20 microns	—	5
3904 50 900	—Others	—	5
	– Fluorurați polymers:		
3904 61 000	– – Politetrafluoroetilenă	—	5
3904 69	—Others:		
3904 69 100	– – – Poly(vinyl fluoride) in one of the forms mentioned in Note 6(b) to the Chapter	—	5
3904 69 200	– – – Fluoroelastomeri FKM	—	5
3904 69 800	——Others	—	5
3904 90 000	–Others	—	5
3905	**Polymers of vinyl acetate or other vinyl esters in primary forms; Other vinyl polymers in primary forms:**		
	– Poly(vinyl acetate):		
3905 12 000	– – In aqueous dispersion	—	5
3905 19 000	—Others	—	5
	– Vinyl acetate copolymers:		
3905 21 000	– – In aqueous dispersion	—	5
3905 29 000	—Others	—	5
3905 30 000	– Poly(vinyl alcohol), whether or not containing non-hydrolysed acetate groups	—	5
	–Others:		
3905 91 000	—Copolymers	—	5
3905 99	—Others:		

Tariff position code	Description of goods	Unit of measurement	Customs duty on import,%
3905 99 100	– – – Poly(formal vinyl), in one of the forms referred to in Note 6(b) to the Chapter, of a molecular weight of 10 000 or more but not more than 40 000 and containing by weight: - 9,5 % or more but not more than 13 % of acetyl groups assessed as vinyl acetate, and — 5 % or more but not more than 6,5 % of hydroxyl groups assessed as vinyl alcohol	—	5
3905 99 900	——Others	—	5
3906	**Acrylic polymers in primary forms:**		
3906 10 000	– Poly(methyl methacrylate)	—	0
3906 90	–Others:		
3906 90 100	– – Poli[N-(3-hidroxiimino-1,1-dimetilbutil) acrilamidă]	—	0
3906 90 200	– – Copolymer of 2-diisopropylaminoethyl methacrylate with decyl methacrylate, in the form of a solution in N,N-dimethylacetamide, containing by weight not less than 55% copolymer	—	0
3906 90 300	– – Copolymer of acrylic acid with 2-ethylhexyl acrylate, containing by weight 10% or more but not more than 11% of 2-ethylhexyl acrylate	—	0
3906 90 400	– – Copolymer of acrylonitrile with methyl acrylate, modified with polybutadiene-acrylonitrile (NBR)	—	0
3906 90 500	– – Product of polymerisation of acrylic acid with alkyl methacrylate and small amounts of other monomers, used as thickener in the manufacture of textile printing pastes	—	0
3906 90 600	– – Copolymer of methyl acrylate with ethylene and a monomer containing a non-terminal carboxy group as a substitute,	—	0
	weighing 50 % or more of methyl acrylate, whether or not combined with silica		
3906 90 900	—Others	—	0
3907	**Polyacetals, other polyethers and epoxy resins, in primary forms; polycarbonates, alkyd resins, allyl polyesters and other polyesters, in primary forms:**		
3907 10 000	– Poliacetali	—	5
3907 20	– Other polyethers:		
	– – Polyether-alcohols:		
3907 20 110	– – – Polyethylene-glycoli	—	5
3907 20 200	——Others	—	5
	—Others:		
3907 20 910	– – – Copolymer of 1-chloro-2,3-epoxypropane with ethylene oxide	—	5
3907 20 990	——Others	—	5
3907 30 000	– Epoxy resins	—	5
3907 40 000	– Policarbonați	—	5
3907 50 000	– Alkyd resins	—	5
	– Poly(ethylene terephthalate):		

Tariff position code	Description of goods	Unit of measurement	Customs duty on import,%
3907 61 000	– – With a viscosity index of at least 78 ml/g	—	5
3907 69 000	—Others	—	5
3907 70 000	– Poli(acid lactic)	—	5
	– Other polyesters:		
3907 91	– – Unsaturated:		
3907 91 100	——Liquid	—	5
3907 91 900	——Others	—	5
3907 99	—Others:		
3907 99 050	– – – Thermoplastic liquid crystal copolymers based on aromatic polyester	—	5
3907 99 100	– – – Poly(ethylennaphthalin-2,6-dicarboxylate)	—	5
3907 99 800	——Others	—	5
3908	**Polyamides in primary forms:**		
3908 10 000	Polyamide-6, -11, -12, -6.6, -6.9, -6.10 or -6.12	—	5
3908 90 000	–Others	—	5
3909	**Amine resins, phenolic resins and polyurethanes, in primary forms:**		
3909 10 000	– Urea resins; thiourea resins	—	5
3909 20 000	– Melamine resins	—	5
	– Other amine resins:		
3909 31 000	– – Poly(methylene phenylisocyanate) (crude MDI, polymeric MDI)	—	5
3909 39 000	—Others	—	5
3909 40 000	– Phenolic resins	—	5
3909 50	– Polyurethanes:		
3909 50 100	– – Polyurethane of 2,2′-(tert-butylimino)diethanol and 4,4′-methylenedicyclohexyl diisocyanate, in the form of a solution in N,N-dimethylacetamide containing by weight 50% or more of polymer	—	5
3909 50 900	—Others	—	1
3910 00 000	**Silicones in primary forms**	—	6,5
3911	**Petroleum resins, coumaron-indenic resins, polyterpenes, polysulphides, polysulphides and other products specified in Note 3 to this chapter, not elsewhere specified or cuprose, in primary forms:**		
3911 10 000	– Petroleum resins, coumarone resins, inden resins, comatory-indenic resins and polyterpenes	—	6,5
3911 90	–Others:		
	– – Polymerisation, reorganisation or condensation products, whether or not chemically modified:		
3911 90 110	– – – Poly(oxy-1,4-phenylenesulfonyl-1,4-phenylene-1,4-phenyleneisopropylidene-1,4-phenylene), in one of the forms referred to in Note 6(b) to the Chapter	—	6,5
3911 90 130	– – – Poli(thio-1,4-fenilenă)	—	6,5
3911 90 190	——Others	—	6,5
	—Others:		

Tariff position code	Description of goods	Unit of measurement	Customs duty on import,%
3911 90 920	– – – Copolymer of p-cresol and divinylbenzene, in the form of a solution in	—	6,5
	N,N-dimethylacetamide, containing by weight 50 % or more of polymer; hydrogenated copolymers of vinyltoluene and α-methylstyrene		
3911 90 990	——Others	—	6,5
3912	**Cellulose and its chemical derivatives, not elsewhere specified or included, in primary forms:**		
	– Cellulose acetates:		
3912 11 000	– – Neplastifiați	—	5
3912 12 000	– – Plastifiați	—	5
3912 20	– Cellulose nitrates (including collodium):		
	– – Neplastifiați:		
3912 20 110	– – – Colodium and celloidin	—	5
3912 20 190	——Others	—	5
3912 20 900	– – Plastifiați	—	5
	– Cellulose ethers:		
3912 31 000	– – Carboxymethylcellulose and its salts	—	6,5
3912 39	—Others:		
3912 39 200	– – – Hidroxipropilceluloză	—	6,5
3912 39 850	——Others	—	6,5
3912 90	–Others:		
3912 90 100	– – Cellulose esters	—	5
3912 90 900	—Others	—	6,5
3913	**Natural polymers (e.g. alginic acid) and modified natural polymers (e.g. hardened proteins, chemical derivatives of natural rubber), not elsewhere specified or included, in primary forms:**		
3913 10 000	– Alginic acid, its salts and esters	—	5
3913 90 000	–Others	—	5
3914 00 000	**Polymer-based ion exchangers of headings 3901 to 3913, in primary forms**	—	5
	II. WASTE, CHIPS, SHAVINGS, SHAVINGS; MOULDINGS; ARTICLES		
3915	**Waste, chips, shavings, plastic shavings:**		
3915 10 000	– Of ethylene polymers	—	6,5
3915 20 000	– Styrene polymers	—	6,5
3915 30 000	– Vinyl chloride polymers	—	6,5
3915 90	– Other plastics:		
3915 90 110	– – Of propylene polymers	—	6,5
3915 90 800	—Others	—	6,5
3916	**Monofilaments whose maximum cross-sectional dimension exceeds 1 mm (monowires), rings, rods, bars and profiles, whether or not surface-worked but not otherwise worked, of plastics:**		
3916 10 000	– Made of ethylene polymers	—	6,5

Tariff position code	Description of goods	Unit of measurement	Customs duty on import,%
3916 20 000	– From vinyl chloride polymers	—	6,5
3916 90	– Of other plastics:		
3916 90 100	– – From reorganisation or condensation polymerisation products, whether or not chemically modified	—	6,5
3916 90 500	– – From addition polymerization products	—	1
3916 90 900	—Others	—	6,5
3917	**Tubes, pipes and their accessories (e.g. joints, elbows, flanges), of plastics:**		
3917 10	– Man-made mats of hardened proteins or cellulosic plastics:		
3917 10 100	– – From hardened proteins	—	5
3917 10 900	– – Made of cellulosic plastics	—	5
	– Rigid tubes, pipes and hoses:		
3917 21	– – From ethylene polymers:		
3917 21 100	– – – Obtained seamlessly or soldered and of a length exceeding the maximum cross-sectional size, whether or not shaped but not otherwise machined	—	6,5
3917 21 900	——Others	—	6,5
3917 22	– – From propylene polymers:		
3917 22 100	– – – Obtained seamlessly or soldered and exceeding the maximum cross-sectional dimension, whether or not shaped but not otherwise machined	—	6,5
3917 22 900	——Others	—	6,5
3917 23	– – From vinyl chloride polymers:		
3917 23 100	– – – Obtained seamlessly or soldered and exceeding the maximum cross-sectional dimension, whether or not shaped but not otherwise machined	—	6,5
3917 23 900	——Others	—	6,5
3917 29 000	– – Made of other plastics	—	6,5
	– Other tubes, pipes and hoses:		
3917 31 000	– – Tubes, pipes and hoses, flexible, capable of withstanding a minimum pressure of 27.6 MPa	—	6,5
3917 32 000	– – Other, not reinforced with other materials, nor otherwise associated with other materials, without accessories	—	1
3917 33 000	– – Other, not reinforced with other materials, nor otherwise associated with other materials, with accessories	—	6,5
3917 39 000	—Others	—	1
3917 40 000	–Accessories	—	6,5
3918	**Plastic floor coverings, whether or not self-adhesive, in rolls or in the form of floor tiles or tiles; wall and ceiling coverings of plastic materials defined in Note 9 to this chapter:**		
3918 10	– From vinyl chloride polymers:		

Tariff position code	Description of goods	Unit of measurement	Customs duty on import,%
3918 10 100	– – Consisting of an impregnated backing, clad or covered with poly(vinyl chloride)	m²	6,5
3918 10 900	—Others	m²	6,5
3918 90 000	– Made of other plastics	m²	6,5
3919	**Self-adhesive plates, sheets, sheets, tapes, ribbons, film and other flat forms, of plastics, whether or not in rolls:**		
3919 10	– In rolls with a width not exceeding 20 cm:		
	– – Strips, ribbons coated with natural or synthetic rubber, uncured:		
3919 10 120	– – – Made of poly(vinyl chloride) or polyethylene	—	0
3919 10 150	– – – Made of polypropylene	—	0
3919 10 190	——Others	—	0
3919 10 800	—Others	—	1
3919 90	–Others:		
3919 90 200	– – Self-adhesive abrasive pads of circular shape, of a kind used for the manufacture of semiconductor wafers	—	6,5
3919 90 800	—Others	—	6,5
3920	**Other plates, sheets, sheets, films, strips, ribbons and slides, of plastics, not corrugated, unreinforced, uncoated, not associated with other materials, not provided with a support:**		
3920 10	– From ethylene polymers:		
	– – With a thickness of not more than 0,125 mm:		
	– – – Of density polyethylene:		
	– – – – Sub 0,94:		
3920 10 230	– – – – – Polyethylene films of a thickness of 20 microns or more, but not more than 40 microns, for the manufacture of photoresistant films for use in the manufacture of semiconductors or printed circuit boards	—	6,5
3920 10 240	– – – – – – – Extendable films, unprinted	—	6,5
3920 10 250	———Others	—	6,5
3920 10 280	– – – – Minimum 0.94	—	6,5
3920 10 400	——Others	—	6,5
	– – Over 0,125 mm thick:		
3920 10 810	– – – Synthetic paper pulp, in wet sheets, consisting of non-cohesive polyethylene fibres, whether or not mixed with not more than 15% cellulose fibres, containing, as a wetting agent, poly(vinyl alcohol) dissolved in water	—	6,5
3920 10 890	——Others	—	6,5
3920 20	– From propylene polymers:		
	– – Not more than 0,10 mm thick:		
3920 20 210	– – – Orientate biaxial	—	5
3920 20 290	——Others	—	5
3920 20 800	– – Over 0,10 mm thick	—	5

Tariff position code	Description of goods	Unit of measurement	Customs duty on import,%
3920 30 000	– Made of styrene polymers	—	6,5
	– From vinyl chloride polymers:		
3920 43	– – Containing by weight at least 6% of plasticisers:		
3920 43 100	– – – Not more than 1 mm thick	—	6,5
3920 43 900	– – – More than 1 mm thick	—	6,5
3920 49	—Others:		
3920 49 100	– – – Not more than 1 mm thick	—	6,5
3920 49 900	– – – More than 1 mm thick	—	6,5
	– From acrylic polymers:		
3920 51 000	– – From poly(methyl methacrylate)	—	6,5
3920 59	—Others:		
3920 59 100	– – – Copolymer of acrylic and methacrylic esters, in the form of films of thickness not exceeding 150 microns	—	6,5
3920 59 900	——Others	—	6,5
	– Of polycarbonates, of alkyd resins, of allyl polyesters or of other polyesters:		
3920 61 000	– – Made of polycarbonates	—	6,5
3920 62	– – From poly(ethylene terephthalate):		
	– – – With a thickness of not more than 0,35 mm:		
3920 62 120	– – – – Poly(ethylene terephthalate) films, of a thickness of 72 microns or more, but not more than 79 microns, for the production of flexible magnetic disks; Poly(ethylene terephthalate) films, of a thickness of 100 microns or more but not more than 150 microns, for the production of photopolymer printing plates	—	6,5
3920 62 190	———Others	—	6,5
3920 62 900	– – – More than 0,35 mm thick	—	6,5
3920 63 000	– – From unsaturated polyesters	—	6,5
3920 69 000	– – From other polyesters	—	6,5
	– From cellulose or its chemical derivatives:		
3920 71 000	– – From regenerated cellulose	—	6,5
3920 73	– – From cellulose acetate:		
3920 73 100	– – – Films in the form of reels or tapes, for cinematography or photography	—	6,5
3920 73 800	——Others	—	6,5
3920 79	– – From other pulp derivatives:		
3920 79 100	– – – Vulcanized fibres	—	6,5
3920 79 900	——Others	—	6,5
	– Of other plastics:		
3920 91 000	– – Made of poly(vinyl butyral)	—	6,5
3920 92 000	– – From polyamides	—	6,5
3920 93 000	– – From amine resins	—	6,5
3920 94 000	– – From phenolic resins	—	6,5
3920 99	– – Of other plastics:		
	– – – Polymerisation, reorganisation or condensation products, whether or not chemically modified:		

Tariff position code	Description of goods	Unit of measurement	Customs duty on import,%
3920 99 210	– – – – Polyamide film and strip, not coated or coated or clad only with plastics	—	1
3920 99 280	——Others	—	6,5
	– – – From addition polymerisation products:		
3920 99 520	– – – – Poly(vinyl fluoride) films; Film of biaxially oriented poly(vinyl alcohol) containing by weight 97 % or more of poly(vinyl alcohol), uncoated, of a thickness not exceeding 1 mm	—	6,5
3920 99 530	– – – – Ion exchange membranes of fluorinated plastic material, used in chlorine-alkaline electrolytic cells	—	6,5
3920 99 590	——Others	—	6,5
3920 99 900	——Others	—	6,5
3921	**Other plastic plates, sheets, film, strip and blades:**		
	– Alveolar products:		
3921 11 000	– – Made of styrene polymers	—	6,5
3921 12 000	– – From vinyl chloride polymers	—	1
3921 13	– – Made of polyurethane:		
3921 13 100	——Flexible	—	1
3921 13 900	——Others	—	6,5
3921 14 000	– – From regenerated cellulose	—	6,5
3921 19 000	– – Made of other plastics	—	1
3921 90	–Others:		
	– – From reorganisation or condensation polymerisation products, whether or not chemically modified:		
3921 90 100	– – – From polyesters	—	6,5
3921 90 300	– – – From phenolic resins	—	6,5
	– – – From amine resins:		
	– – – – Laminate:		
3921 90 410	– – – – – Under high pressure, with decorative surfaces on one or both sides	—	6,5
3921 90 430	———Others	—	6,5
3921 90 490	———Others	—	6,5
3921 90 550	——Others	—	6,5
3921 90 600	– – From addition polymerization products	—	6,5
3921 90 900	—Others	—	6,5
3922	**Bathtubs, shower tubs, washbasins, washbasins, bidets, toilet bowls, toilet seats and lids, water tanks and similar articles for sanitary or hygienic uses, of plastics:**		
3922 10 000	– Bathtubs, shower tubs, sinks and washbasins	—	6,5
3922 20 000	– Chairs and lids for toilets	—	6,5
3922 90 000	–Others	—	6,5

Tariff position code	Description of goods	Unit of measurement	Customs duty on import,%
3923	**Transport or packaging articles of plastics; caps, caps, caps, capsules and other closing devices, of plastics:**		
3923 10	– Boxes, crates, baskets and similar articles:		
3923 10 100	– – Boxes, crates, baskets and similar articles, of plastics, specially made for the transport or packaging of semiconductor wafers, masks or reticules	—	6,5
3923 10 900	—Others	—	6,5
	– Bags, bags, bags and cornets:		
3923 21 000	– – Made of ethylene polymers	—	6,5
3923 29	– – Of other plastics:		
3923 29 100	– – – From poly(vinyl chloride)	—	6,5
3923 29 900	——Others	—	6,5
3923 30	– Cans, bottles, flasks and similar articles:		
3923 30 100	– – With a capacity not exceeding 2 l	—	6,5
3923 30 900	– – With a capacity of more than 2 l	—	6,5
3923 40	– Moulders, coils, grooves and similar supports:		
3923 40 100	– – Coils and similar supports for running photographic and cinematographic films and films or tapes, films, etc. referred to in heading 8523	—	6,5
3923 40 900	—Others	—	1
3923 50	– Plugs, stoppers, caps, capsules and other closing devices:		
3923 50 100	– – Capsules and stoppers for sealing	—	6,5
3923 50 900	—Others	—	6,5
3923 90 000	–Others	—	6,5
3924	**Tableware, other household or household articles and hygiene or toilet articles, of plastics:**		
3924 10 000	– Tableware and other items for dining or kitchen	—	6,5
3924 90 000	–Others	—	6,5
3925	**Articles for the equipment of construction works, of plastics, not elsewhere specified or included:**		
3925 10 000	– Tanks, drums, vats and similar containers, with a capacity exceeding 300 l	—	6,5
3925 20 000	– Doors, windows, frames and frames, window sills and thresholds	—	6,5
3925 30 000	– Shutters, blinds (including Venetian blinds) and similar articles and parts thereof	—	6,5
3925 90	–Others:		
3925 90 100	– – Accessories and fittings intended for final installation in or on doors, windows, stairs, walls or other parts of construction	—	6,5
3925 90 200	– – Pipes, pipes and wall boxes, for electrical circuits	—	6,5
3925 90 800	—Others	—	1
3926	**Other articles of plastics and articles of other materials of headings 3901 to 3914:**		

Tariff position code	Description of goods	Unit of measurement	Customs duty on import,%
3926 10 000	– Office supplies and school supplies	—	6,5
3926 20 000	– Garments and accessories (including gloves, mittens and one-finger gloves)	—	6,5
3926 30 000	– Gaskets for furniture, bodies or similar	—	6,5
3926 40 000	– Statuettes and other ornaments	—	6,5
3926 90	–Others:		
3926 90 500	– – Gratings and similar articles for filtering water at the inlet to the drain	—	6,5
	—Others:		
3926 90 920	– – – Made of sheets	—	6,5
3926 90 970	——Others	—	1

Source. of Law 172/2014 on the approval of the Combined Nomenclature of Goods. Section VII. mplastics and articles of plastic; rubber and rubber articles.