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Serbian Journal of Management 19 (2) (2024) 429 - 447

Serbian Journal of Management

WASTE MANAGEMENT IN SLOVAKIA AND POLAND AS EUROPEAN UNION MEMBER STATES

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(Received 18 June 2024; accepted 19 August 2024)

Abstract

The basic European Union (EU) waste legislation is regulated by European Waste Framework Directive (1975). Since then, this directive has been significantly revised and updated and all EU members are obliged to implement the EU waste legislation into their legislation. The article presents the most important issues related to waste management in Slovakia and Poland. The paper reviews national legislation along with EU legislation. The study includes relevant conclusions with a brief comparison of the analyses carried out. The obtained results shows that the main goal relating to municipal waste - significant deviation from waste landfilling, set in both states, was not achieved.

Keywords: waste management, European Union, environmental policy, EU member states Slovakia and Poland, sustainable development.

1. INTRODUCTION

European Union (hereinafter EU) protects the environment and human health in the waste relating legislation by preventing and reducing the generation of waste. Moreover, it underlines the improving of waste management efficiency for guaranteeing the Union's long-term competitiveness. The new Circular Economy Action Plan COM/2020/98 that was adopted by EU commission in 2020, states that global consumption of materials such as biomass, fossil fuels, metals and minerals is expected to double in the next forty years, while annual waste generation is projected to increase by 70% by 2050 (Figue 1).

The first documents constituting the basis for waste management in the European Union appeared in 1975 year, when Directive 74/442/EEC setting out the Community strategy on waste was introduced. Currently, waste management is regulated by Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain directives (The

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DOI: 10.5937/sjm19-51705

Waste framework Directive). This directive establishes a legal framework for dealing with waste hierarchy of waste policies that aim to: preventing waste generation, reuse, recycling and recovery of unavoidable waste, waste disposal through safe storage, using landfills in Jakarta to the slightest extent (Wladarz, 2003).

The European Union also regulates other aspects related to waste management and classification. Down basic legal provisions, which constitute an extension of the basic waste directive, can be included, among others: regulations defining hazardous waste and methods of dealing with it (Council Directive No 91/689/EEC on hazardous waste, as amended by Council Directive 94/31/EC), Regulation on the transport of waste (Regulation (EC) No. 1013/2006), regulations on the treatment of waste fractions, such as packaging and packaging waste (Directive 94/62/EC, as amended), waste electrical and electronic equipment (Directive 2002/96/EC, as amended), batteries and accumulators (Directive 2006/66/EC) and vehicles withdrawn from service (Directive 2000/53/EC), regulations regulating waste treatment technologies (Directive 2000/76/EC on the incineration waste, Directive 1999/31/EC on the landfill

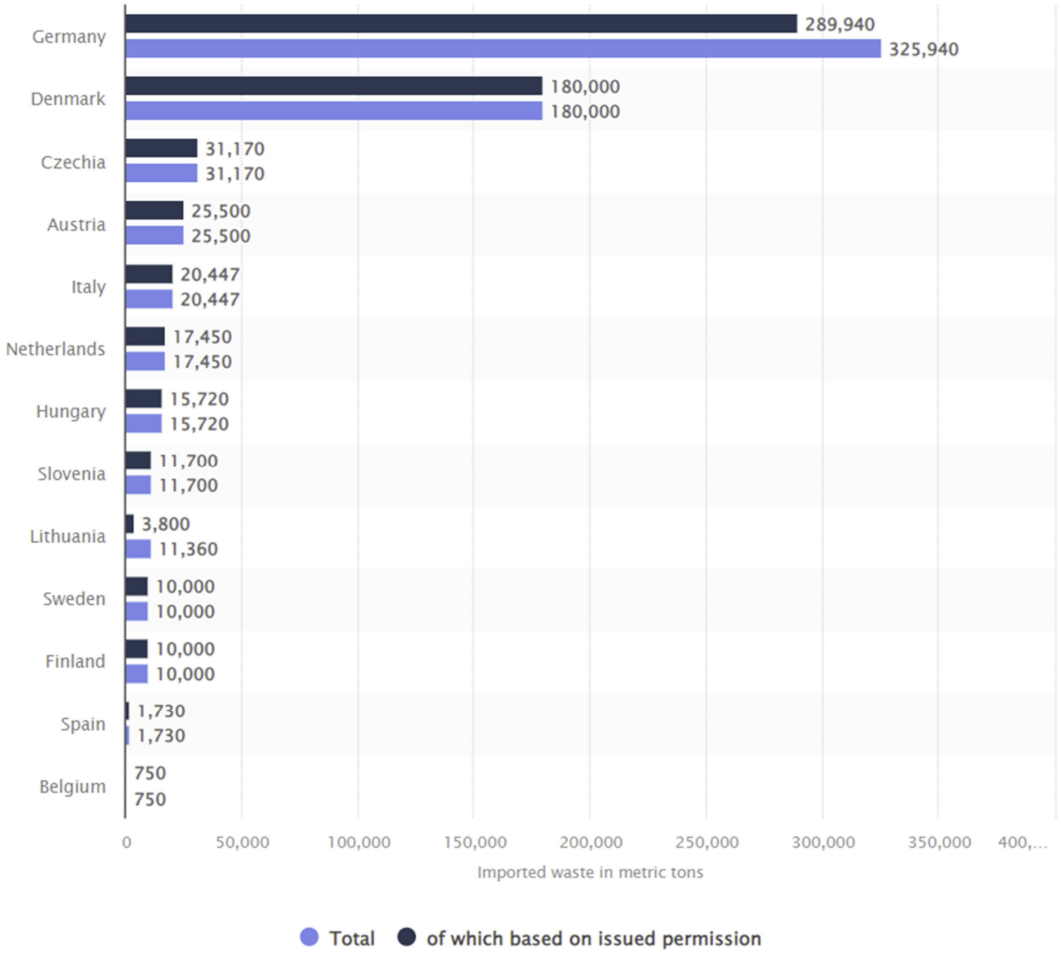

Figure 1. Quantity of imported waste from European Union countries to Poland in 2022 (Source: https://www.statista.com/statistics/1042388/poland-imports-of-waste-from-the-eu/)

of waste)and new Circular Economy Action Plan COM/2020/98.

Slovakia and Poland, being member states of the European Union, had to adapt to EU standards. Therefore, the provisions of Directive 2008/98/EC and other legal provisions have been implemented into their national legislation in a number of acts and regulations regarding waste management. The basic waste legislation in SR is the Law no. 79/2015 Collection of Laws that is still valid and efficient but was amended 36 times (the last change was done by Law no. 430/2021 Collection of Laws). Another important Slovak act is Law no 329/2018 Collection of Laws on fees for waste disposal and on amendments to the Act No. 587/2004 Coll. on the Environmental Fund. The Slovak Republic belongs to countries where the landfilling represents the most widely used method of waste disposal (Čerňanová et al., 2019). Roughly 41% of household waste continues to end up in landfills, which is the most environmentally harmful way of managing waste, contributing additionally to the greenhouse effect.

The recycling rate was reported at 49%. Only about 9% of municipal waste was converted into electricity or heat in waste-to-energy facilities (Slučiaková, 2019).

The Waste framework Directive and other EU waste legislation is implemented not only into Slovak laws but also into fundamental waste strategies.

The most important Slovak waste strategies are the Strategy of Environmental Policy of SR until 2030 (Greener Slovakia, 2019), the Slovak Waste Management Program (SWMP) for the years 2021-2025 and Slovak Waste Prevention Program for the years 2019-2025 (SWPP) (Valenćiková & Fandel, 2023). Solid waste management is one of the most important functions of a city government, as a key utility service on which the public health and the external ‘image’ of a city depend (Wilson et al., 2014). In charge of the waste management in Slovakia are both state and self-government.

The responsible institution in SR in the field of waste management within the state administration is at the central level the Ministry of Environment of the Slovak Republic (hereinafter Ministry), and at the local level, there are district offices (72 in Slovakia). Except of state bodies, municipalities, (2927 in Slovakia) as self-government bodies, are responsible for municipal waste management as well.

In Poland, waste is also divided differently depending on its properties, category and nature. More on this in detail later in the work (Leboda, 2002).

The first legal act in Poland dealing with the issue of environmental protection against waste was the Act of January 31, 1980 on the protection and management of the environment.

The basis of current legal regulations was previously the Act of June 20, 2001 on waste (Journal of Laws of 2001, No. 62, item 628, as amended), which was replaced this year by the Act of December 14, 2012 on waste (Journal of Laws of 2013, No. 0, item 21), implementing the waste management rules applicable in the European Union.

In Slovakia, the first law on waste was issued on 17. March 2015 (Law no. 79/2015 Collection of Laws), in effect since 1st January 2016. This basic waste legislation was amended 36 times but we consider this instrument insufficient to prevent illegal waste placement (Marišová & Fandel, 2022).

The following definitions are of fundamental importance in the current acts from the point of view of compliance with

EU law: waste, particular types of waste, activities covered by the collective term "management", economic entities (Jerzmanski, 2006). Other legal provisions constituting the legal basis for waste management in the Republic of Poland include: regulations on the treatment of waste such as batteries and accumulators (Journal of Laws of 2009, No. 79, item 666), mining waste (Journal of Laws 2008, No. 138, item 865), waste electrical and electronic equipment (Journal of Laws 2005 no. 180 item 1495), end-of-life vehicles (Journal of Laws 2005, No. 25, item 202), packaging and packaging waste (Journal of Laws 2001, No. 63, item 638), Act on the prohibition of the use of products containing asbestos (Journal of Laws of 1997, No. 101, item 628), regulations on maintaining cleanliness and order in municipalities (Journal of Laws 2011, No. 152, item 897), Act on the international shipment of waste (Journal of Laws 2007, No. 124, item 859), Act on the obligations of entrepreneurs regarding the management of certain waste and on fees product and deposit fee (Journal of Laws 2001, No. 63, item 639).

In Poland, the Ministry of Climate, previously the Environment, as well as individual administrative units are responsible for supervision and legislative guidelines, Voivode ship boards and assemblies as well as authorities in communes and counties, including larger presidential cities (Skowronski, 2009).

Today, adequate waste services are considered vital to the governance of cities, industries, and refugee camps: a basic human right, an economic opportunity and an ecological imperative (Reno, 2015) (Figure 2).

We agree with the definition of municipal waste as the total amount of recovered materials originating from households and small local businesses where collection is provided by the local government (Wright &

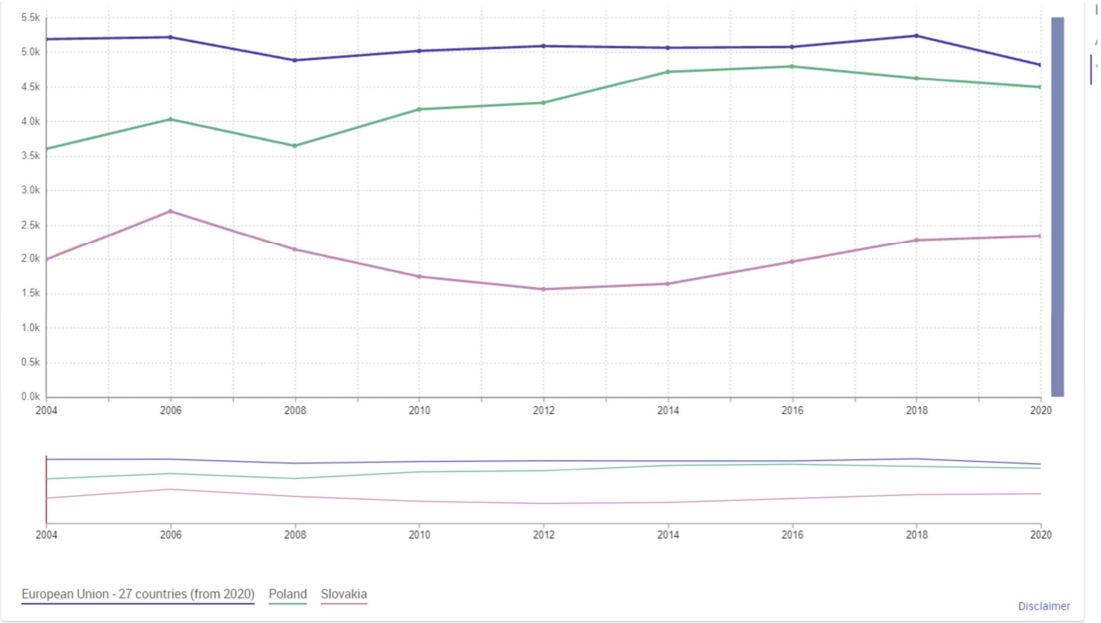

Figure 2. Waste generation per capita (Source: Waste generation per capita (Eurostats, 03/01/2024), https://ec.europa.eu/eurostat/databrowser/view/cei-_pc034/default/bar?lang=en)

Boorse, 2017). Waste is the symbol of inefficiency of any modern society and a representation of misallocated resources. Significant progress has been achieved in reducing waste, but it varies from city to city. Currently, cities use their waste diversion rate as a tool to measure the performance of their waste management systems (Zaman & Lehmann, 2013).

Recycling plays a crucial role in the circular economy process. It is a process in which materials that have already been used at least once are reused. Recycled materials can be used independently or as additives in the production of new products, with the aim of reducing production costs and improving the properties of the product. The main benefit of recycling is the reduction of waste volume, the decrease in greenhouse gas emissions, and the reduction of natural resource consumption. To achieve a high level of waste recycling, it is essential to separate waste at home (Stoeva, 2017).

Greener Slovakia focuses on better environmental quality and a sustainable circular economy using as few non-renewable natural resources and hazardous toxic substances as possible. At the same time, in line with the EU Green Deal (2019), it also imposes more efficient management on the public administration of the Slovak Republic (Valenćíková, 2021) focuses on this strategy and states that this strategy emphasizes the need to modernize the current economy to a sustainable economy that does not harm the environment.

2. OBJECTIVE AND METHODOLOGY

The paper focuses on the analysis of basic European Union waste legislation and waste legislation of EU member states – Slovakia and Poland, including their waste strategies which implement the EU waste goals.

Firstly, we analyse the basic European Union (hereinafter EU) waste legislation: Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives that was amended by Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018, (Waste Framework Directive), The European Green Deal COM (2019), Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste, and a new Circular Economy Action Plan COM/2020/98 .

Secondly, we analyse, to what extent the Slovak and Polish legislation and their strategies implements the EU goals in the environment and waste issues. The method of analysis and evaluation of selected strategies of the Slovak Republic in accordance with the EU legislation is used to examine to what extent the provisions of the above-mentioned EU legislation and the objectives set in the Slovak Waste Management Program (SWMP) for the years 2021-2025, the Strategy of Environmental Policy of the Slovak Republic until 2030, as well as Waste Prevention Program for the years 2019-2025 are fulfilled in the field of waste in the Slovak Republic. The same analysis is applied to Slovak Waste legislation.

Waste management in Poland is regulated by a number of acts and implementing regulations (Teodorowicz, 2013). Due to the fact that Poland is still adapting its law to European Union standards, these dynamics changes significantly hinder the functioning of entrepreneurs on the market. The most important laws establishing the framework for the entire waste management are: Act of December 14, 2012 on waste (as amended),

Act of April 27, 2001, Environmental Protection Law (as amended), Act of October 3, 2008 on providing information on the environment and its protection and participation society in environmental protection and on environmental impact assessments (as amended).

The next group consists of laws that regulate in detail the treatment of individual groups waste. It includes the following legal acts: Act of July 29, 2005 on waste electrical and electronic equipment Act of May 11, 2001 on packaging and packaging waste (as amended), Act of 11 May 2001 on the obligations of entrepreneurs regarding the management of certain waste and the product fee and deposit fee (as amended), Act of July 10, 2008 on mining waste (as amended), Act of January 20, 2005 on the recycling of end-of-life vehicles, Act of April 24, 2009 on batteries and accumulators (as amended), Act of June 29, 2007 on the international shipment of waste (as amended), Act of July 1, 2011 amending the Act on maintaining cleanliness and order in municipalities and certain other acts (as amended).

3. RESULTS AND DISCUSSION

Before commenting the results of detailed analysis of the most important legal acts regulating waste issues in Slovakia and Poland, we focus on the analysis of basic European Union waste legislation.

3.1. The EU waste legislation analysis

In the EU waste legislation, the Directive 2008/98/EC (Waste Framework Directive) plays a fundamental role. This directive contains key definitions of individual process concepts waste management, it also describes the general principles of this management, as well as the main obligations, including the obligation for facilities to have a permit related to this economy. These rules are established hierarchically (Dziadkiewicz, 2006). The first is the principle of preventing the creation or limiting the amount of waste and its harmfulness. This is done by promoting cleaner technologies aimed at economical use of natural resources; placing products on the market that would not increase the amount of waste or waste harmfulness, as well as the development of such techniques for the neutralization of hazardous substances from waste intended for recovery (Jerzmanski, 2006).The Waste Framework Directive strengthens rules on waste prevention and sets new municipal-waste-recycling targets: by 2025, at least 55% of municipal waste by weight will have to be recycled. This target will rise to 60% by 2030 and 65% by 2035.

Šimková et al. (2023) adds that key elements of the revised waste proposal include:

- binding target to limit landfilling to a maximum of 10% of municipal waste by 2035 (with possible exceptions to postpone the deadline to reach this target by 5 years)
- the obligation of the separate collection is strengthened and extended to hazardous household waste (until 1 January 2025),
- biological waste (until the end of 2023) and textiles (until 1 January 2025).

Directive 1999/31/EC of 26 April 1999 on the landfill of waste (consolidated, 2018) divides waste dumps into three categories: dumps for hazardous waste, dumps for non-hazardous waste, and dumps for inert waste (waste that does not decompose or burn, such as gravel, sand, and stones). EU countries must implement national strategies to gradually reduce the amount of

biodegradable waste sent to dumps. Dumps must not accept used tires or waste that is liquid, flammable, explosive, or corrosive, nor waste from hospitals, healthcare, and veterinary care. Only treated waste may be deposited in dumps.

Consolidated Directive 2018/850 stipulates:

• from 2030 onwards, limitations on landfilling all waste suitable for recycling or material or energy recovery are introduced,

• a reduction in the proportion of municipal waste landfilled to 10% by 2035 is required,

• EU countries are required to implement an effective system for quality control and traceability of municipal waste landfilled,

• the European Commission, in collaboration with the European Environment Agency, is required to produce early warning reports three years before the expiration of each deadline, identifying deficiencies in achieving the objectives and providing recommendations for action.

In July 2018, the EU Circular Economy Package was introduced by the EU Commission with relevance for management of municipal waste. The key EU strategy for addressing resource scarcity, climate change, environmental degradation and biodiversity loss induced by consumption is the Europe's circular economy. It aims at keeping products and materials in use for the longest time possible; it aims to minimise flows of materials by using less materials and energy to produce new products; and it promotes reuse and recycling strategies to close material cycles. If products and materials can be kept in the economy for longer, then fewer virgin materials and energy will need to be extracted from the environment, reducing the environmental pressures related to extraction, emissions, and waste generation.

Another important document is the European Green Deal (2019), whose elements are reflected in national strategies (Valenćiková & Marišová, 2023). The European Green Deal is a package of political initiatives aimed at putting the European Union on the path to ecological transformation, and ultimately achieving climate neutrality by 2050. It is also intended to support the transformation of the European Union into a fair and prosperous society with a modern and competitive economy. Climate change and environmental degradation pose a threat to Europe and the rest of the world. To meet these challenges, the European Green Deal action plan was created. It aims to help transform the EU into a modern, resource-efficient and competitive economy: which will achieve net zero greenhouse gas emissions in 2050 in which economic growth will be separated from resource consumption where no person or region is left behind. The benefits of the European Green Deal is primarily about improving the well-being and health of future generations, and therefore: fresh air, clean water, healthy soils and biodiversity; renovated energy-efficient buildings; healthy and affordable food; greater public transport offer; cleaner energy and the latest green technological innovations; longer lasting products that can be repaired, recycled and can be reused; future-proof jobs and skills needed for transformation. The European Green Deal will be financed by one third of the €1.8 trillion in investment under the Next Generation EU recovery plan and from funds from the EU's seven-year budget. Assumptions of the European Green Deal. The European Green Deal aims to make Europe climate neutral by 2050. To make this target legally binding, the Commission proposed a European Climate Law, which,

among other things, sets a new, more ambitious target for net greenhouse gas emissions - a reduction of at least 55%. by 2030 compared to 1990 levels. Over 75 percent greenhouse gas emissions in the EU come from the production and use of energy. Decarbonizing the EU energy system is therefore key to meeting our 2030 climate goals and the EU's long-term strategy to become carbon neutral by 2050 (Sojka, 2022).

3.2. Slovak and Polish waste legislation analysis

Europen environmental Agency (EEA) evaluates each 4 years the European environment, including all changes that have occurred in the environment and socio-economic context to help explain many of the environmental trends that have been observed. All EU member states implement the EU waste legislation to optimize the waste management performance.

After defining long-term targets, and even short-term targets, it is necessary to adopt set of provisions that ensure their fulfillment. This can be accomplished through the adoption of various legislative, as well as non-legislative, instruments to combat climate change that will contain concrete measures to achieve the set climate goals (Michalovič & Figuli, 2023).

So, Slovakia did, in The Slovak Waste Management Program (WMP 2021-25) and this program is based also on the third Europe's environment "The third assessment" that states about the waste: Total waste quantities continue to increase in most EU countries. Municipal waste arisings are large and continue to grow (Figure 3).

We analysed the Slovak main waste strategies and found out some differences relating to Waste framework Directive:

• WMP SR for years 2021-25 imposes that the rate of sorted collection of municipal

Figure 3. Annual turnover of the waste collection industry in Slovakia from 2013 to 2022 (in million euros)(Source: https://www.statista.com/statistics/430071/turnover-waste-collection-industry-slovakia/)

waste should be increased to 60% by 2025, and the rates of preparation for reuse and recycling of municipal waste to 55% (article 4.2.1 WMP SR). It doesn't set a percentage of landfilling municipal waste and states that building new waste landfills is not necessary.

Status of the set goals in the previous WMP SR for years 2016-2020

We analysed whether the goals set in the previous WMP SR for years 2016-2020 (2015) were achieved and found out the following results:

Several important planned results were not accomplished:

• Main goal of the previous program 2016-2020: Significant deviation from waste landfilling.

• Achieve a 50% recycling rate of municipal waste by 2020.

• Achieve a 40% separate collection rate of municipal waste by 2018 and 60% by 2020.

• Limit the landfilling of biodegradable municipal waste to 35% of the total weight of biodegradable waste generated in 1995 by 2020.

Measures that are continuously fulfilled:

• Support the financing of projects for reuse and preparation for reuse in the municipal sector, such as "reuse centers." The Ministry of Environment of the Slovak Republic (MŽP SR) has created conditions for supporting the financing of projects for reuse and preparation for reuse in the municipal sector.

• Evaluate the possibility of adjusting the amount and mechanism of waste disposal fees redistribution between municipalities and the Environmental Fund in order to create sufficient financial resources to support waste prevention and separate collection of municipal waste.

• Act No. 329/2018 Coll. on Waste Disposal Fees was adopted. An implementing regulation - Government Regulation of the Slovak Republic - was adopted for the law, which establishes the rates of waste disposal fees. One of the principles of the new economic instrument must be that the amount of waste disposal fees for waste landfills must be based on the rate of separation of municipal waste.

Our research indicates that as of 2021, Slovakia's rate of waste incineration with energy recovery and landfilling rate of municipal waste are below the EU average, while the recycling rate, both for materials and composting and digestion, is higher (Marišová & Fandel, 2024).

Except of WMP SR, Slovakia adopted another waste strategies, among them the most important is Envirostrategy (Greener Slovakia, 2019) that sets waste goals for the further future until 2030 and 2035 in a little different rates:

• Envirostrategy 2030 imposes that the municipal waste recycling rate, including the preparation for re-use, will be increased to 60%, and the land-filling rate will be reduced to less than 25% by 2035.

Measures up to year 2030

• Envirostrategy 2030 sets that sufficient state, public and private funding sources will be secured to ensure that all objectives and measures of this strategy 2030 will be fulfilled. Measures will also be taken to ensure that only waste that has previously undergone some form of waste treatment, corresponding to the higher priorities of the waste hierarchy is landfilled. Subsequent consideration will be given to introducing other fees to support measures that are higher in the waste hierarchy.

Slovakia mostly lags behind industrialised countries in waste management and air quality. The rate of

municipal waste recycling is currently on the EU average (49%), while land-filling is still the dominant form of waste disposal, and its rate is one of the highest in the EU (Greener Slovakia, 2019).

Raising landfill fees is a good incentive to sort waste, prevent waste and create pressure to increase recycling. It has been shown that a higher fee is likely to gradually reduce the landfill rate, but it must be suitably complemented by other measures. Fees for the disposal of municipal waste in a landfill in Slovakia are one of the lowest in the EU. For the measure to be effective, the municipalities will include in the municipal waste fee, the full costs of municipal waste management within the scope of the applicable legislation.

All municipalities are obliged to pay a fee for landfilling mixedmunicipal waste and bulky waste. The amount of waste to be charged for depositing at a landfill is determined by the landfill operator by weighing it at the landfill. This should pressure on the municipalities to improve their separate municipal waste collection systems and we believe that it will indirectly put pressure on the citizens to recycle more (Čerňanová et. al., 2019).

Envirostrategy 2030 maps the environmental situation in Slovakia, indicates the fundamental problems in waste management, illegal landfills, missing collection of municipal waste, based on the waste volume. At the same time, it defines a vision until 2030, which considers a possible, probable, and the desired future development, sets the objectives until 2030 and proposes a framework for measures to improve the current situation.This strategy similarly like WMP SR sets some long run aims to achieve the waste goals to be achieved according to EU and Slovak waste legislation. For example, limit for food waste production should be reduced by 2030. Restaurants and supermarkets will be obliged to make use of the food, for example, by charity donation of the food that fulfils food safety requirements. If they are no longer suitable for consumption, they will be able to compost them or energetically utilize (e.g., by selling at a reduced price for feeding purposes, except for the feeding of wild animals).The Slovak legislation has fulfilled this commitment, as the Food Act No. 152/1995 Coll., effective from 01/01/2017, established the following: Food products past their minimum durability date can be transferred free of charge by the operator to an entity engaged in activities for public benefit, but only if the products are safe. A charitable organization can handle food products past their minimum durability date only after being registered, and it is mandatory for the organization to request an official inspection by the relevant regional public health authority for each distribution point of the charitable organization, as specified by a separate regulation. (Marišová et al., 2020) Despite the progress in implementation of EU waste legislation into Slovak one, Slovakia has to face an action of European Commission at European Court of justice. According to Council Directive 1999/31/EC on the landfill of waste, EU member states were supposed to close old landfills by July 16, 2009. In January 2023, the European Commission referred the case of Slovakia to the Court of Justice of the European Union for its failure to rehabilitate and close several landfills that do not comply with the requirements of the waste landfill directive.

The task of member states, including Poland, is to design waste management in such a way that it does not have a negative

impact on the environment and human health. For this purpose, strict conditions for the operation of installations should be established, the use of the waste management hierarchy should be encouraged (the practical application of the hierarchy should be encouraged), and waste prevention measures should be applied, including the development of waste prevention programs using economic instruments. The introduction of extended producer responsibility is intended to support the production of products that takes into account and facilitates the efficient use of resources throughout their entire life cycle. Reuse and recycling should take priority over recovery in order to bring the EU as close as possible to a "recycling society", striving to minimize waste generation and use it as a resource. Achieving this goal is determined by the levels of recycling of municipal waste, packaging waste and the levels of reduction of landfilled waste, including biodegradable waste, necessary to be achieved in 2025, 2030 and 2035. EU countries should support as much as possible activities in the field of selective collection and facilitating the use of raw materials from recycling, should not support the landfilling or incineration of this waste. It is also important to create conditions for selective collection and appropriate processing of bio-waste in order to reduce greenhouse gas emissions. Waste storage must be carried out in a controlled manner, using the required treatment processes. It is necessary to take effective measures to prevent abandonment, uncontrolled storage and disposal of waste. Management of packaging and packaging waste should enable and facilitate multiple use, recycling and other forms of recovery, hence the need to define requirements regarding the composition of packaging (including the use of heavy metals) and properties enabling multiple use and recovery, and to introduce return, collection and recovery systems. this type of waste and ensuring sales markets for processed packaging waste. The policy regarding the management of waste electrical and electronic equipment (WEEE) is based primarily on efforts to reduce the amount of WEEE generated, supporting reuse and recycling (convenient return infrastructure) and improving the ecological nature of the activities of entities involved in the life cycle, including: entities involved in collection and processing. To this end, it is necessary to establish eco-design requirements for products that are easier to re-use, dismantle and recover, simplify administrative obligations, registration and reporting procedures and encourage producers to use recycled materials (improving sales markets). In the case of end-of-life vehicles, the main emphasis is placed on plastics recycling, its continuous improvement, including by supporting the production of vehicles that facilitates subsequent recycling and recovery, and supporting sales markets for recycled materials.

Actions in accordance with the waste hierarchy are also emphasized in the context of achieving sustainable consumption and production, one of the goals of the "2030 Agenda", the sustainable development strategy of UN countries, including the EU, announced in 2015. The amount of waste generated should be significantly reduced by 2030, using preventive and recovery activities (Hajto, 2022).

In July 2018, a revised legislative framework for waste management entered into force, aiming to modernize waste management systems in the Union. These

include:

1. new levels of recycling,
2. simplification and unification of definitions and calculation methods and clear legal status of recyclates and by-products,
3. stricter regulations and new obligations regarding separate collection (bio-waste, textile products and hazardous waste generated by households, construction and demolition waste),
4. minimum requirements for extended producer responsibility,
5. more effective waste prevention and strengthening waste management measures, including marine litter, food waste and products containing critical raw materials.

The consolidation of the texts of the "waste directives" in 2018 was the result of summarizing the effects of changes introduced to legislation in line with the idea of the EU's transition to a circular economy, another important strategy shaping current and future EU policy. The 'Circular Economy by 2050' is one element of the 'European Green Deal', the 2019 action plan for a circular economy set out to boost jobs, growth and investment and achieve a carbon neutral, resource-efficient and competitive economy. In the waste sector, achieving this goal will be possible thanks to activities in the field of waste reuse, recycling, research and development work, production and use of biogas from biomass, improving production efficiency - production of durable and repairable products, or greater involvement of eco-design, e.g. by 2030, all packaging used in the EU could be recycled (reduction of waste generated) (Figure 4).

Waste management of plastics, textiles, WEEE, food, packaging, batteries and end-of-life vehicles is key to creating a closed loop, which again means the need for activities in the field of reuse, recovery and recycling (maximizing the potential of waste), activities in the field of waste prevention food, creating products that are

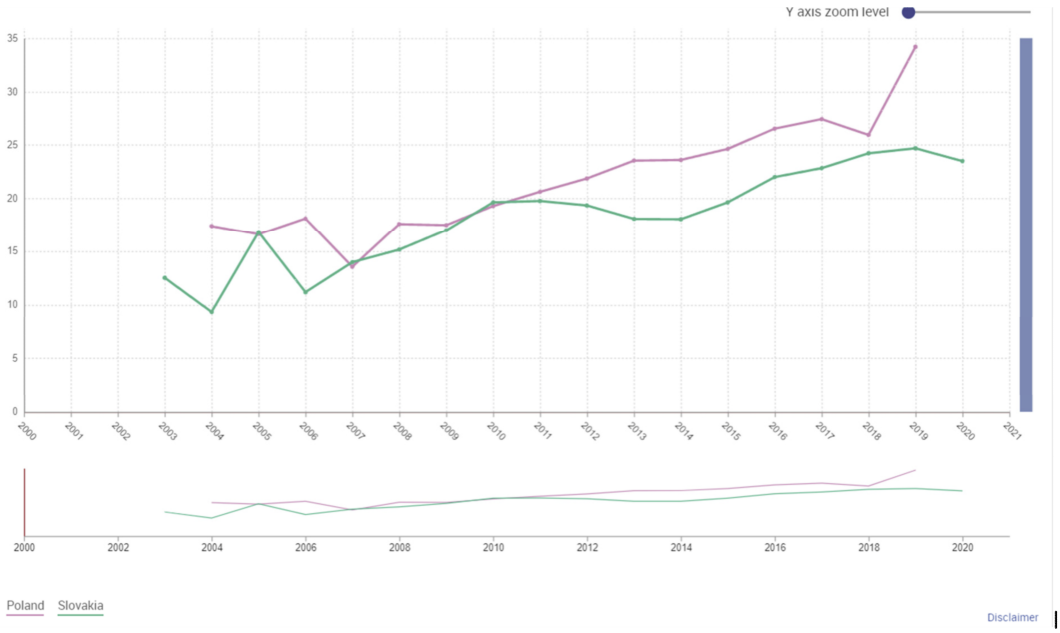

Figure 4. Generation of plastic packaging waste per capita (Source: Generation of plastic packaging waste per capita (Eurostats) https://ec.europa.eu/eurostat/data-browser/view/cei_pc050/default/line?lang=en)

durable and at the same time easy to process at the end of their life cycle, creating the necessary collection points and building processing plants. Preventing and minimizing waste generation and limiting the negative impact of waste management on human health and the environment will have a positive impact on the volume and efficiency of resource use, which is essential for the transition to a circular economy.

The EU Strategy for Plastics in a Circular Economy, adopted in 2018, is the first EU-wide framework to use a material lifecycle approach to integrate circular design, use, reuse and recycling activities into plastics value chains (Hajto, 2022).

The goals adopted for implementation in the 2028 are consistent with the discussed EU policy in the field of waste management and concern key issues:

1. preventing waste, reducing the amount of waste generated and extending the usefulness of products - increasing public awareness in this respect, supporting activities related to the reuse of products, creating reuse points at, increasing the role of eco-design,

2. support for waste management based on the waste hierarchy - promoting the correct way of dealing with waste and the benefits resulting from it, reducing the use of single-use plastic products, promoting bio-waste processing technologies for fertilization or recultivation purposes,

3. achieving the required levels of municipal waste recycling and reduction levels of landfilled waste - including: increasing the efficiency of the municipal waste and packaging waste collection system,

4. streamlining and improving the efficiency of recycling systems, improving the quality of recyclates, developing sales markets,

5. increasing the levels of separately collected waste, selective collection of ashes or textile waste and developing technologies for recycling waste that is currently not subject to recycling - achieving minimum annual recycling levels for multi-material packaging, packaging for hazardous substances, systematic improving the efficiency of recycling WEEE, batteries and accumulators, end-of-life vehicles, used tires, construction materials,

6. increasing the recovery of raw materials and energy - recovery of biodegradable waste, municipal sewage sludge,

7. construction of necessary processing installations - increasing the accessibility of for residents, creating reuse points at construction or modernization of municipal waste processing installations (recycling installations, bio-waste fermentation installations), modernization of mechanical-biological waste processing (MBP) installations,

8. increasing the role of eco-design in production processes – in terms of reuse, repair and recyclability; supporting scientific units in conducting research on alternatives to hazardous ingredients, e.g. mercury,

9. implementation of good practices - implementation and promotion of good practices in the field of issues related to waste in the marine environment, food waste prevention, exchange of information/cooperation between environmental protection authorities, etc.

10. increasing public awareness and education - organizing and conducting educational and information activities at the national and municipal level, in the field of selective waste collection, the effects of illegal waste management, the correct way of

dealing with WEEE; used batteries and accumulators or used tires; increasing awareness of sellers and users of hazardous substances,

11. control, monitoring - control and monitoring of PCB waste management, illegal waste storage, improvement of the quality of data collected in BDO (Hajto, 2022).

4. CONCLUSION

Most countries in the world have standards for segregation, selective collection and further waste management. They create the framework in which the waste management sector operates (Figure 5).

The analysis of the process of implementing of the EU waste legislation into Slovak legislation shows that Slovakia transferred the EU waste goals into its legislation and the most important Slovak strategies – waste management program and Environmental strategy 2030. These strategies set the aims and measures how to achieve them.

Slovakia's rate of waste incineration with energy recovery and landfilling rate of municipal waste are below the EU average, while the recycling rate, both for materials and composting and digestion, is higher.

The general trend in the amount of municipal waste in Poland indicates a systematic increase in the period under study. These values start at 297 million tonnes in 2013 and increase to 364 million tonnes in 2022. It is worth noting that after 2018, the growth rate of municipal waste seems to be more stable compared to previous years. Rather than significant spikes in waste, we see a gradual, steady increase.

In the last two years (2021 and 2022), an increase in the amount of municipal waste in Poland can be seen compared to previous years. In 2022, the amount of waste is 364

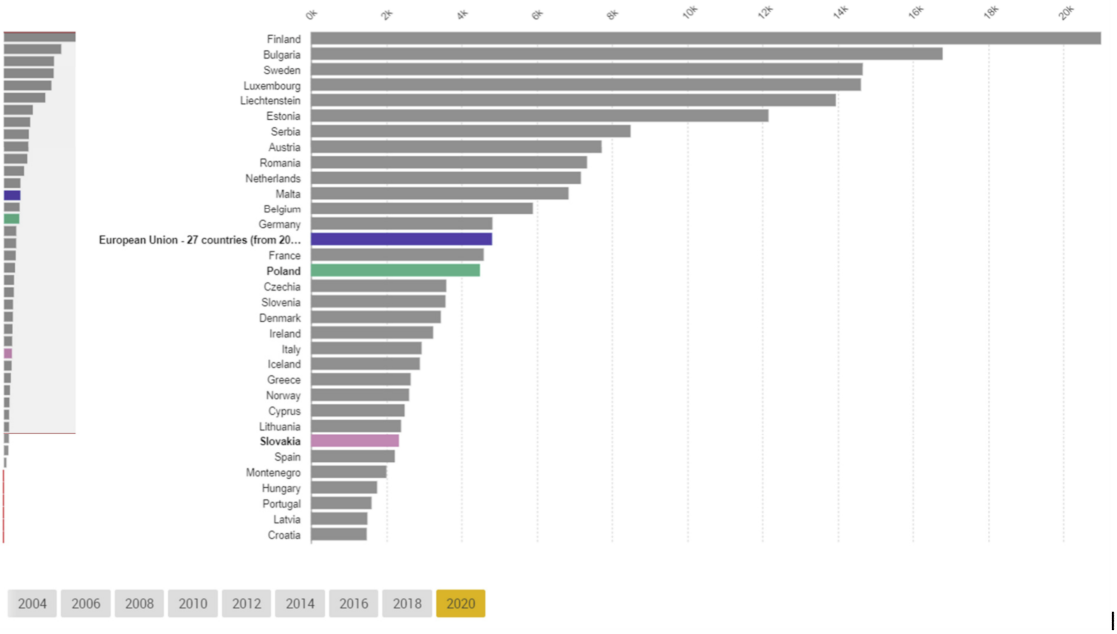

Figure 5. Waste generation per capita (Source: Waste generation per capita (Eurostats, 03/01/2024), https://ec.europa.eu/eurostatdatabrowser/view/cei-_pc034/default/bar?lang=en)

million tons, which means a significant jump compared to previous years. The increase in the amount of municipal waste may be the result of economic growth, increased consumption, changes in consumer habits, as well as environmental policies and actions taken to improve waste management.

Taken together, these data suggest that the amount of municipal waste in Poland is constantly increasing, although the rate of growth may vary from year to year. This is important for developing waste management strategies and taking actions to reduce the negative impact on the environment.

Analyzing data on the amount of municipal waste in Slovakia in 2013-2022, the following trends and observations can be noted:

There is a noticeable increase in the amount of municipal waste in Slovakia during these years. From 2013 to 2022, the amount of municipal waste increased from 304 to 478 million tons. Despite the general upward trend, it can be seen that in recent years (from 2020 to 2022) the amount of municipal waste tends to stabilize or even slightly decline. In 2022, the amount of waste amounted to 478 million tons, which may suggest stabilization after a period of dynamic growth. In some years, such as 2016 and 2017, the increase in municipal waste was particularly significant, suggesting possible changes in waste policy, population growth, or other factors influencing the amount of waste produced. It is worth noting that in 2021 and 2022 the amount of municipal waste appears to increase significantly compared to previous years, which may be the result of various factors such as changes in the economy, increase in production industrial or changes in consumer habits.

Analysis of this data can be helpful in understanding the dynamics of municipal waste production in Slovakia and may provide guidance on possible waste management and environmental protection actions (Figure 6).

However, we have to state that in Slovakia, only slightly less than 13% of the population of pays a fee for municipal waste and small construction waste based on the amount of waste produced (Institute of Environmental Policy, 2019). Most of municipalities charge residents an annual flat fee that is the same for all residents, regardless of the amount of waste produced. This form of fee does not motivate citizens to reduce waste production or increase sorting and composting of waste. In January 2023, the European Commission referred the case of Slovakia to the Court of Justice of the European Union for its failure to rehabilitate and close several landfills that do not comply with the requirements of the Waste Landfill Directive.

In Poland, in accordance with the Waste Act, waste management means the generation and management of waste, i.e. its collection, transport, processing, supervision, disposal and trade. Modern comprehensive municipal waste management systems in highly developed countries are created based on the idea of segregation and recycling of waste from households, small industry, services and trade.

In Poland, in 2004, over 95% of municipal waste generated was disposed of by landfilling. Today, this method of waste management is being abandoned in favor of recycling. Currently, we still store nearly 40% of the waste we generate, we recycle nearly 30%, and we burn the rest in waste incineration plants or compost it (Teodorowicz, 2013). However, by far the

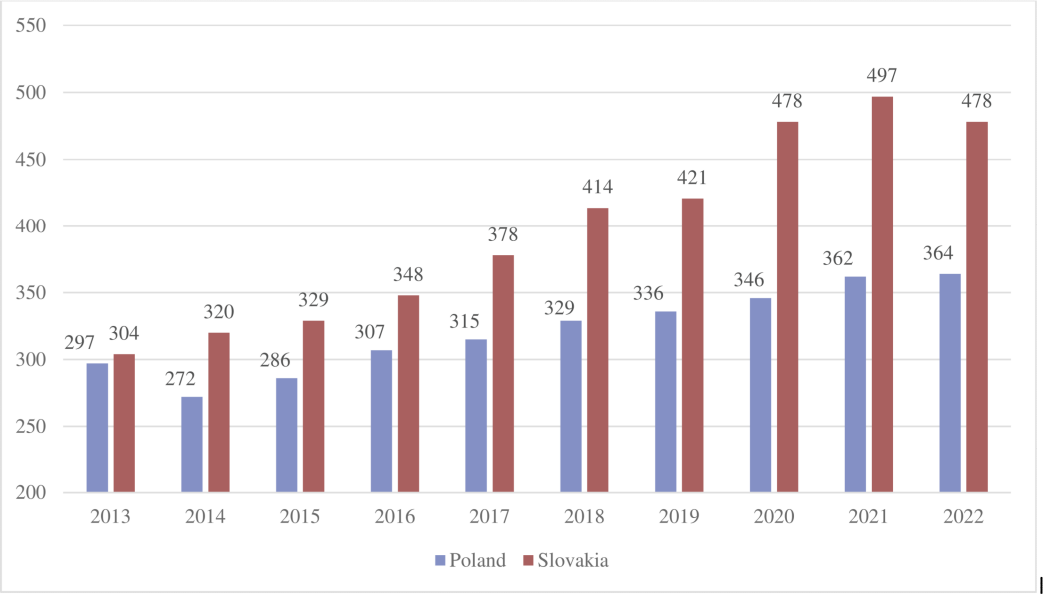

Figure 6. Poland and Slovakia (Source: Eurostat.)

most desirable method of their management is the use of raw materials contained in the waste in the recycling process.

Accession to the European Union resulted in progress in the construction of waste sorting and processing installations and increased the rate of raw material recovery. From July 1, 2017, uniform rules for selective waste collection came into force in Poland. As for Slovakia, on 27. November 2019 Law no. 460/2019 Collection of laws amended the Slovak waste Law no. 79/2015/ Collection of Laws and it adopts measures to favor manufacturers placing recyclable products on the market, as well as measures to promote waste reuse, recycling and other recovery activities. The deadline for submitting reports regarding the reporting obligations of the Slovak Republic to the European Commission is being adjusted.

The changes being implemented are intended to ensure that Poland achieves EU recycling standards. In 2020 it is to be 50%, and in 2035 as much as 65% (Teodorowicz, 2013). Failure to achieve these recycling levels risks imposing huge fines on Poland that will be felt by all of us. Fines are one thing, but a much more serious consequence of neglecting or improper waste management is the complete degradation of our planet. Waste management brings many benefits that we are not always aware of or we consider them unimportant and not directly related to us. However, by separating waste in the household, we minimize the threats to human life and health. However, another advantage of waste segregation is the acquisition of secondary raw materials, which results in less consumption of natural resources. Not without significance is the fact that selective waste collection is also simply cheaper.

Acknowledgement

This work was supported by the Slovak Research and Development Agency under

the Contract No. APVV-20-0076" entitled "Waste and Construction - Modelling the Effectiveness of Alternative Options for Cooperation between Administrative Authorities".

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УПРАВЉАЊЕ ОТПАДОМ У СЛОВАЧКОЈ И ПОЉСКОЈ КАО ДРЖАВАМА ЧЛАНИЦАМА ЕВРОПСКЕ УНИЈЕ

Bartosz Nieścior, Eleonóra Marišová

Извод

Основно законодавство Европске уније (ЕУ) о отпаду регулисано је Европском оквирном директивом о отпаду (1975). Од тада, ова директива је значајно ревидирана и ажурирана и све чланице ЕУ су у обавези да имплементирају законодавство ЕУ о отпаду у своје законодавство. У чланку су представљена најважнија питања везана за управљање отпадом у Словачкој и Пољској. У раду се разматрају национално законодавство заједно са законодавством ЕУ. Студија укључује релевантне закључке са кратким поређењем спроведених анализа. Добијени резултати показују да основни циљ који се односи на комунални отпад – значајно одступање од депоновања отпада, постављен у обе државе, није остварен.

Кључне речи: управљање отпадом, Европска унија, еколошка политика, земље чланице ЕУ Словачка и Пољска, одрживи развој

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