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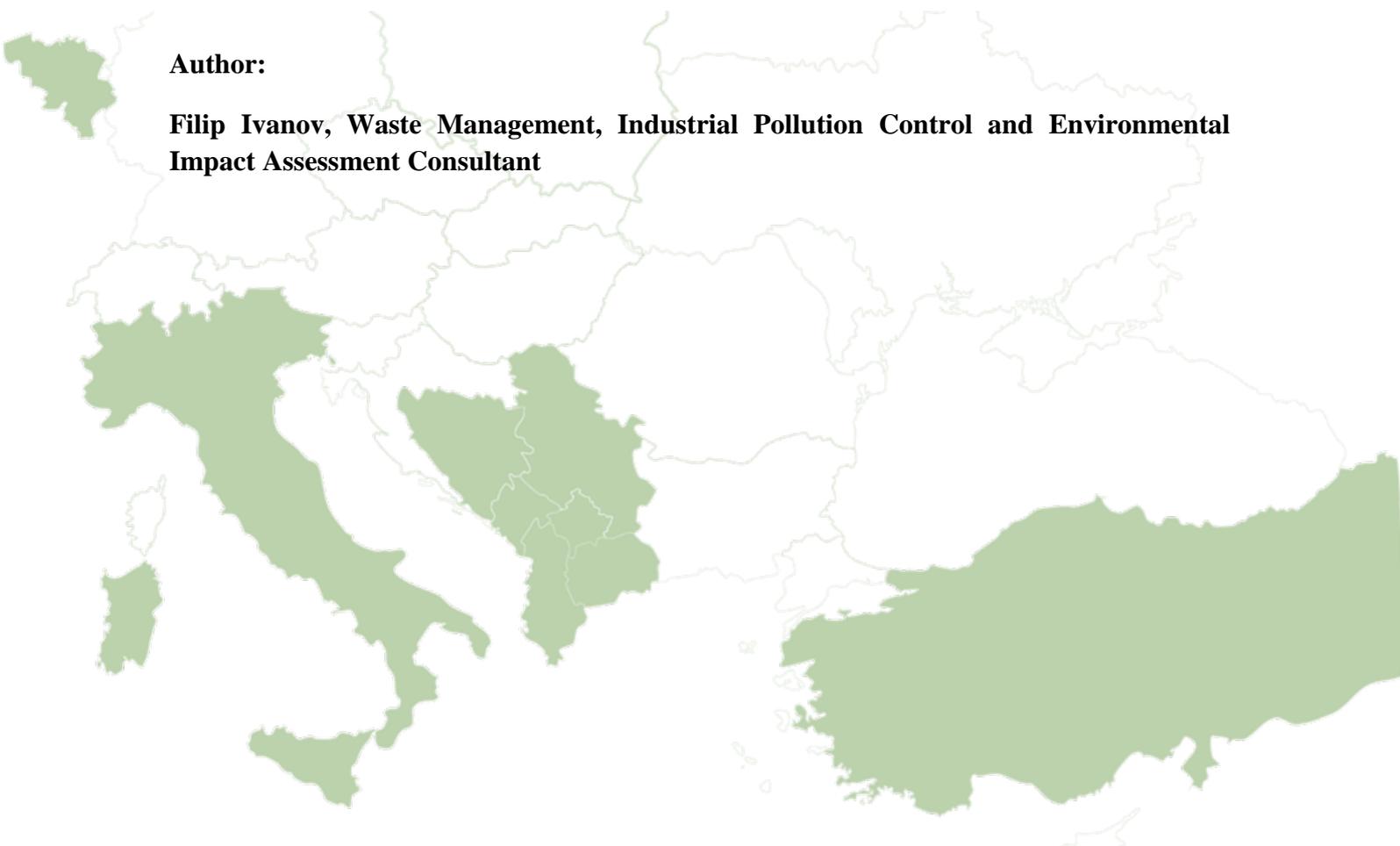
**“Environmental Network factoring the environmental portfolio for
Western Balkans and Turkey in the EU Policy Agenda”**

Analysis:

**Comparative analysis of the Macedonian with the EU *acquis* in
the field Management of biodegradable waste**

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1. Introduction

The efforts made by the Republic of Macedonia to join the European Union have imposed an imperative on the harmonization of national legislation with that of the EU in all spheres, including waste management. This also applies to the management of bio-degradable wastes that, as a fraction, occur in communal waste, but also in other waste streams, such as agricultural waste, garden waste, food and beverage waste, but do not include waste from agriculture, stock excrement, sludge from communal wastewater, textile from natural materials, paper or processed timber. In this context, the definition of biodegradable waste is set out in the Landfill of Waste Directive 1999/31 / EC of 26 April 1999, now amended by Directive 2018/850 of the European Parliament and of the Council of 30 May 2018) and is accepted by the Law on Waste (Consolidated text "Official Gazette of the Republic of Macedonia" No. 09/11), where according to Article 6, item 8, "Biodiversity is a waste" –Whatever a thing that can be opened with annealing (without the occurrence of acid) or an aerobic (with an opening acidity of the sludge) through the process of biodegradation such as food waste or pruning waste, as well as paper and paperboard.

The aim of this paper is to make a comparative analysis of the Macedonian legislation with that of the EU and to provide an overview of the shortcomings in the national legislation in order to introduce an integrated waste management system.

This approach enables monitoring of the waste management hierarchy given in the EU legislation which requires reduction of waste generation, re-use, processing, utilization (mostly for energy needs) and finally disposal in sanitary landfills that meet the standards prescribed with the Landfill Directive.

Additionally, with the approval of the four Directives of the Circular Economy Package in May 2018, the European Parliament has established a legal framework aimed at closing the circle of product life cycles through a greater degree of recycling and re-use and providing guidance on how to develop national legal acts of member states or candidate countries for EU membership.

The analysis was made on the basis of comparing the acts that stipulate the general and specific rules for the management of bio-degradable waste.

2. EU policies and legislation on biodegradable waste management

Characteristic of the European Union legislation in this area is the existence of a number of legal acts and the absence of a single policy and defined legislation. Namely, there is no directive for biodegradable waste that would define the rules for its management.

In the light of this, it is evident from the data reviewed that in the procedure for assessing whether a new biodegradable waste regulation is needed, the conclusions of the European Parliament (EP) do not correspond with the position of the European Commission (EC).

According to the EP conclusions, the commission should prepare specific legal acts for the introduction of compulsory recycling of biodegradable waste as the rules for managing this waste are fragmented and legal instruments insufficient to achieve the goals set in the Landfill Directive referring to the biodegradable waste.

The EC's position is that the existing legislation in this area creates excellent preconditions for the proper management of biodegradable waste, as evidenced by the progress made in several Member States.

What is necessary is the development of quality standards for compost, which would allow for proper valorisation of the same according to its quality, as well as developing guidelines for appropriate use depending on the purpose.

What is crucial for the commission is the rigorous application of the rules for the diversion of biodegradable waste to landfills, in accordance with the Landfill Directive, the appropriate application of the waste management hierarchy established by the Waste Framework Directive and the introduction of separate collection of this waste in the direction of implementation for these purposes.

2.1 Waste Framework Directive (Directive 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98 / EC on waste)

This Directive in Article 19 (amending Article 22 of Directive 2008/98 / EC on waste) obliges Member States by 31 December 2023 to ensure that biodegradable waste is selected and recycled at the source of generation or collected separately and do not interfere with other types of waste.

At the same time, Member States may permit waste with similar biodegradability and compostability properties to be collected and treated with this waste.

Member States are also encouraged to treat this waste in accordance with the waste management hierarchy by promoting separate collection for the purpose of composting and bio-digestion (anaerobic treatment), in a way that ensures a high level of environmental

protection, encourage domestic composting, but at the same time to encourage use of the materials produced from bio-waste.

In that direction, the European Commission asks the European Standardization Organizations to develop biodegradable waste standards that enter the recycling process as well as the quality criteria for compost and digestat, based on the best available practice by 31 December 2018,.

In order to encourage the treatment of biodegradable waste, Article 12 (which amends Article 11 of Directive 2008/98 / EC on waste) of this Directive, introduces targets for reuse and recycling. Although biodegradable waste is not included in the waste types to be collected separately or for recycling targets of the Member States, they have been instructed by December 31, 2024 and have to prepare recycling targets for biodegradable waste, and from 1 January 2027, Member States may calculate the processing of biodegradable waste as recycling only if, pursuant to Article 22, this waste has been selected at the source of generation or separately collected. In order to establish uniform conditions, by March 31, 2019, the EC should provide rules for calculation verification and reporting for this type of waste.

Certainly, in addition to this, Article 6 states that a certain type of waste ceases to be waste if it has undergone processing (composting or biodegestion), including recycling, and is in accordance with certain criteria that, in the case of biodegradable waste, to be developed in the future¹.

Under Article 22 (amending Article 29 of Directive 2008/98 / EC on waste), Member States are required to establish waste prevention programs. These programs can be embedded either in the waste management plans or acting as separate programs. In addition, Member States should establish specific programs for the prevention of food waste that need to be incorporated into general waste prevention programs and which should be consistent with the 2030 United Nations Sustainable Development agenda. They should achieve a reduction of 30% by 2025 and 50% by 2030. In order to be measurable, the methodology within the EU should be developed, which will enable reporting on the results achieved annually - in accordance with the requirements of the Directive.

In order to prevent food waste, Member States should set targets for collecting unsold food products at all levels of the supply chain and for their redistribution.

1 Although in some Member States there are national quality criteria for compost, at EU level such standards do not exist and there is a need such standards to be further developed and adopted

2.2 Landfill Directive (Directive 2018/850 of the European Parliament and of the Council of 30 May 2018 amending Directive 1999/31/EC on the landfill of waste)

This Directive makes even more stringent the objectives set out in the previous Directive, primarily in the interest of promoting the principles of the circular economy.

Article 5 (5) of the Directive states that Member States should establish and take all necessary measures to ensure that by 2035 the amount of waste to be disposed of at landfills represents 10% of the total generated waste. In order to achieve this, it is necessary to establish a ban on the disposal of biodegradable waste, which was separately collected for recycling and processing in accordance with Directive 2008/98 / EC.

In order to ensure the reliability of the data, it is necessary to precisely define the rules under which Member States are required to report. This should be done on the basis of data on land filled waste after treatment operations such as, for example, stabilization operations (composting, biodegestion and combustion) of biodegradable waste.

2.3 Industrial Emissions Directive (Directive 2010/75/EU on industrial emissions)

The Industrial Emissions Directive introduces general rules for issuing permits for industrial plants. This directive did not include facilities for the treatment of biodegradable waste, although in the reference documents for Best Available Techniques for Waste Treatment, anaerobic digestion has been described as one of the methods for treating biodegradable waste.

With the Impact Assessment for the Industrial Emissions Directive (Directive 2010/75 / EU on industrial emissions) were identified inconsistencies regarding the biological treatment of organic waste and was recommended that this sector be included in the EU Directive, which is also done for plants disposal of non-hazardous waste including biological treatment with a capacity of 50 tons per day, non-hazardous waste recovery facilities that include biological treatment with a capacity of 75 tons per day as well as facilities for anaerobic digestion with a capacity exceeding 100 tonnes per day. Incorporating the Directive on waste incineration (Directive 2000/76 / EC on the incineration of waste), this Directive prescribes emission limit values and the requirements for monitoring air pollutants and discharges into the water in order to reduce the impact on environment from the combustion of waste. Most types of waste incineration plants fall within the scope of the Directive, with certain exceptions, such as those for combustion only of biomass (vegetable waste from agriculture and forestry).

2.4 Thematic Strategy on Waste Prevention and Recycling of waste (Thematic Strategy on the prevention and recycling of waste COM(2005) 666)

The reducing the generated waste at the source itself and reducing the hazardous content of that waste automatically simplifies its delay. Prevention of waste is closely related to the improvement of processing methods and the impact of consumers looking for greener products and less packaging. The Thematic Strategy on Waste Prevention and Recycling

treats waste prevention as one of the priority issues. According to the Strategy, although waste prevention is a leading goal in national and EU waste management policies for many years, limited progress has been made in transforming this goal into practical action.

The Thematic Strategy on Waste Prevention and Recycling refers to the report on national strategies and points out that there is no single best option for biodegradable waste management that is being diverted from landfills in terms of environmental protection. It is concluded that the management of this type of waste should be determined by Member States using life cycle thinking.

Legislation and policies that relate to the management of biodegradable waste, but do not apply to biodegradable waste originating from communal waste, but are not further shown here, are:

- EU Renewable Energy Policy and the Renewable Energy Sources Directive;
- Thematic soil strategy and proposal for the Soil Framework Directive;
- The Packaging Directive;
- European Climate Change Program;
- Soil protection when using sludge from wastewater;
- Nitrates Directive;
- Common agricultural policy.

3. Policies and legislation of the Republic of Macedonia regarding the management of biodegradable waste

Similar to EU, Republic of Macedonia does not have one legal act that defines the rules for handling biodegradable waste. However, the first steps towards the establishment of a general waste management policy are set out in the First National Environmental Action Plan (NEAP) since 1996 in order to improve the situation and then establish a sustainable waste management system. Harmonization with EU requirements was made with the revision of the same in 2007 (NEAP II), and the general policy framework for waste management, and in the context of this text and with biodegradable waste, was established by the Law on Waste Management.

3.1 LAW ON ENVIRONMENT ("Official Gazette of the Republic of Macedonia" No. 53/05, 84/05, 24/07, 159/08, 83/09, 48/10, 124/10, 51/11, 123/12, 93/13, and 44/15)

The environmental law provides general guidelines for the protection of media in the environment, as well as the main procedures that provide such protection. In this direction, in accordance with this Law, in chapter XII - Integrated environmental permits, as well as the Decree on determining the activities of installations for which an integrated environmental permit is issued, permit for adjustment with an operational plan and time schedule for

submitting a request for adjustment permit with an operational plan, "Official Gazette of the Republic of Macedonia" no. 89/05 (which arises from this chapter), which defines the activities that are subject to the procedure for such permits, there are general definitions such as "Installations for the disposal or recycling of animal carcasses and animal waste with a processing capacity greater than 2 to 10 t / day "or" Installations for combustion of animal carcasses "that may relate to biodegradable waste, thus leaving the opportunity to review the best available techniques for treating biodegradable waste, while not clearly defined for what and facilities and capacity. So there are disadvantages in determining the activities and capacities for the treatment of biodegradable waste that are subject to integrated environmental permits, regardless of whether they are combustion plants, composting or biodegistry plants.

3.2 LAW ON WASTE MANAGEMENT ("O.G. of the Republic of Macedonia" No. 68/2004, 71/2004, 107/2007, 102/2008, 143/2008, 124/10, 51/11, 123/12, 147/13, 163/13, 51/15, 146 / 15, 156 / 15,192 / 15; 39/2016 and 63/2016)

The existing and current Law on Waste of the Republic of Macedonia is almost completely harmonized with the Landfill Directive 1999/31 / EC and the Waste Framework Directive 2008/98 / EC. However, it needs its alignment with the new package of directives developed in the spirit of the Circular Economy. For that purpose, a new package of legal acts has already been prepared, which is in line with the above directives, but is still in the procedure for approval.

Given that this material is being prepared at the moment when the date of approval of the new package of laws by the competent authorities is not certain, the analysis of the Macedonian legislation is focused on the existing legal acts.

According to Article 86 of this Law, as unacceptable for landfills, waste containing a high percentage of biodegradable ingredients (eg paper, garden waste, etc.) is prohibited for landfilling. In doing so, the Minister of Environment shall prescribe the quantity of biodegradable ingredients in the waste that may be disposed of.

This is a starting point for defining the obligations in Article 17 determining the content of the Waste Management Plan of the Republic of Macedonia, which should contain concrete measures and activities for reducing the biodegradable components in the waste destined for disposal (by landfilling) and the timing and scope of their realization.

Based on this, and in accordance with Article 20 of this Law, and in order to implement the measures and activities foreseen in the Plan, a Waste Management Program should be developed, which should include, inter alia, measures and activities for encouraging the composting of the biodegradable waste, as well as measures and activities for realization of the obligations for reducing the amount of biodegradable waste that is removed at the landfills.

In Article 29, which defines waste processing operations, composting and other methods of biological transformation are provided, and in the context of this in accordance with Article 34 prior to the waste disposal procedures, it shall be subjected to mechanical, physical, chemical, thermal or biological treatment, in order to reduce the amount of waste, its volume and negative impacts on the environment, human life and health.

This law derives from strategic documents such as the Waste Management Strategy and the National Waste Management Plan, which sets out the benchmarks for handling biodegradable waste for a period of 12 and 6 years. In addition, in the form of by-laws, the rules and objectives that should be implemented in handling biodegradable waste are given.

3.3 WASTE MANAGEMENT STRATEGY 2008-2020, ("Official Gazette of the Republic of Macedonia" no. 39/08)

The Waste Management Strategy reflects the national policy in the field of waste management and forms the basis for the preparation and implementation of an integrated waste management system. This strategic document defines the fundamental guidelines in the area of waste management for a twelve year period (2008-2020) and sets out the basic guidelines for the gradual establishment of a waste management system, based on the hierarchy of the basic principles of waste management, as well as the basic principles of the sustainable use of natural resources.

In the context of this, even in the area where the basic principles of waste management are defined, it is indicated that the appropriate management of biodegradable waste can greatly contribute to the reduction of greenhouse gas emissions, reducing the amount of waste deposited at the landfill, and in doing so it is a potential resource that can contribute to economic growth.

From the aspect of the institutional set-up and technical infrastructure, it was concluded that biodegradable waste and other special waste streams are not the first priority of the strategy, but it is left to be resolved after obtaining information on the quantities and composition of this waste. Investment projects in this area are left to be realized by the end of the duration of the strategy. Due to the separation of the fractionation of biodegradable waste from municipal waste in the direction of its processing, special collection is envisaged or when it is not possible, selecting this waste using mechanical biological treatment.

However, in the part of waste processing as a substitute for natural resources, the management of biodegradable waste is defined as one of the key principles for the implementation of the guidelines from the EU's Thematic Strategy on new ones, mentioned above in the part referring to European legislation. In this regard, since this waste represents a significant fraction of municipal waste, its processing by composting or biodegestion will significantly contribute to the reduction of the quantities of this waste deposited at the landfill and will enable the utilization of renewable sources of materials or energy, but also to improve the qualitative properties of the soil through the use of compost.

The strategy raises the question of establishing quality standards for compost, for its use in agriculture, without harmful consequences for the environment and human health.

In the area of economic mechanisms or instruments, the necessity of their establishment is imposed in the direction of valorisation of products derived from biodegradable waste, whether it is compost or energy.

According to the strategy, in order to achieve the targets for draining biodegradable waste at the landfill, it is necessary to develop planning documents and legal acts that will define the steps for achieving these goals as well as the time limits for which they will be achieved. Such documents are the National Waste Management Plan, by-laws that regulate the handling of this waste and its disposal at landfills, as well as a separate plan for the management of biodegradable waste.

3.4 NATIONAL WASTE MANAGEMENT PLAN 2009-2015, ("Official Gazette of the Republic of Macedonia" no. 77/09)

The National Waste Management Plan (NWMP 2009-2015), although expired, as an integral part of the National Environmental Action Plan, is based on the adopted Waste Management Strategy of the Republic of Macedonia, which reflects the national waste management policy and is the basis for the preparation and implementation of an integrated waste management system, with maximum efficiency in terms of costs.

The purpose of this document is to provide an appropriate policy for environmental protection, decision-making framework, economic basis, public participation and gradual establishment of a technical infrastructure for the implementation of waste management activities in order to implement the management system for waste in accordance with the EU legislation and the Sixth EU Environmental Action Program (2002-2012), taking into account its waste management priorities, the Thematic Strategy on Sustainable Use and the Thematic Strategy on Waste Prevention and Recycling.

In the context of biodegradable waste, an integral part of the NWMP is the Special Composting Study, which is an integral part of the Special Recycling Study (Annex 5 of the NWMP), as well as the Agricultural Waste Study, which is an integral part of the study on strategies outside municipal waste Annex 1 of the NWMP) that do not have an integrated approach to the rules for the treatment of biodegradable waste but provide data and guidelines that can serve as a basis for the development of a separate management plan for the same.

In the Composting Study, the possibilities for establishing a composting system for the biodegradable fraction of communal waste in the Republic of Macedonia were considered; including economic parameters of how much would it cost to build a standard installation for composting such waste at municipal and regional level. These parameters are incorporated in the integral text of the NSWMP and indicate that the projected costs of processing 1 ton of biodegradable waste are high and amount to 43 euros. Therefore, it is not recommended to initiate co-forming activities during the duration of the plan. The recommendations go in the

direction that in order to avoid the costs of separate collection and treatment of this type of waste, it should be separated using technologies such as MBT and as such it should be used to cover non-standard landfills. At the same time, the composting study provides recommendations for the development of a composting market and the preparation of quality standards for compost that would allow for its proper use according to quality. Also, this study provides guidelines for raising public awareness in this direction, as a basic precondition for establishing a composting system in Macedonia in the aftermath of 2015.

In the Agricultural Waste Study, among other things, the biodegradable waste is covered, where estimates of the quantities of different types of biodegradable waste in Macedonia are made, as well as recommendations on the way they should be handled.

In the integral text of the NWMP, it is recommended to prepare technical and investment documentation for the introduction of plants for Mechanical - Biological Treatment of Municipal Waste. This would enable the separation of the biodegradable component of municipal waste and its treatment with appropriate technology, whether composting or biodegestion.

In order to establish a system that will enable proper management of biodegradable waste, it is recommended that all primary and secondary legislation to be drafted to enable proper handling, upgrading the institutional / organizational structures, strengthening human resources, establishing a regional infrastructure for communal waste management, introduction of economic instruments in the form of introducing greater compensation for the disposal of this waste at the landfill, but also in the form of incentives for the use of biodegradable waste for energy production. These mechanisms should enable separate collection of biodegradable waste and be an additional incentive for investments by the private sector in biodegradation facilities. Of course, the implementation of the environmental protection standards prescribed by the national legislation implies.

According to the analyzes, made in the NWMP, the biodegradable waste accounts for 26.2% of the municipal waste, i.e. 148 819 tons per year (the analyzes were made in 2005). Given that days it does not collect separately or does not separate from the communal with the MBT, there is no organized system for composting or biodegestion, with the exception of small pilot projects that have no significance at the national level.

In order to reduce the amount of landfill waste at landfills and to extend their service life, as well as to achieve the targets for closing non-standardised landfills, the objectives and timeframe for reducing biodegradable waste deposited at landfills by 75% by 2014 are given in relation to the date of publication of the plan.

3.5 Rulebook on the quantity of biodegradable ingredients in the waste that may be disposed of, "Official Gazette of the Republic of Macedonia" no. 108/09 and correction of the same "Official Gazette of the Republic of Macedonia" no. 142/09

As the title itself says with this rulebook, the quantity of biodegradable substances in the waste that can be deposited is determined, with the aim of applying prevention, recycling, composting, biodegistry or other way of utilizing the material and energy of biodegradable waste in the direction of reduction emissions of greenhouse gases, avoiding land capture due to landfill, preserving natural resources, saving fossil fuels and reducing negative environmental impacts from landfills Here biodegradable waste. Article 3 of the Rulebook defines the term biodegradable components of communal waste, the measures for its prevention, as well as the terms for composting, biogas and mechanical biological treatment (MBT).

Article 4 sets out the targets for reducing the amount of biodegradable municipal waste that can be deposited at a landfill for each year, especially since 2011 and ending in 2027. As a starting state, the annual generation of communal waste of 572 000 tonnes , a mass fraction of biodegradable ingredients of 62% and a growth rate of 1.5% given in the NWMP (2009-2015). In the period from 2011 to 2017, a decrease of 25% compared to the initial value is foreseen, in the period 2011-2020, a reduction of 50% is anticipated compared to the initial value, and in the period 2011-2027 it is predicted 65% in relation to the initial value.

Articles 5 and 6 define the rules for handling this waste, especially in the direction of landfilling of municipal waste landfills.

3.6 Rulebook on the general rules for handling communal and other types of non-hazardous waste, Official Gazette of the Republic of Macedonia no. 147/07

The purpose of this rulebook is to reduce the quantities of waste that are being nurtured or disposed of at the landfill and to allow recycling of used waste products from the waste, but also the fulfilment of the obligation of the co-owners and waste handlers to select, export, adopt, collect, transport and handing over the waste.

In order to achieve this goal, the rulebook requires the creation of collection schemes (Article 5) in which waste that can be used (including the biodegradable) should be separated from the one that should be deferred. Article 8 requires that the various fractions of the waste be collected in special containers for the proper purpose. At the same time, pursuant to Article 9, biodegradable waste is collected in containers with brown lids, and garden waste in appropriate bags.

3.7 Other regulations

List of types of waste ("Official Gazette of the Republic of Macedonia" no. 100/05) provides an overview of the types of waste and is in line with the European catalogue of the waste.

According to this list, biodegradable waste located in group 02 - cumulative waste, subgroup 20 01 separately collected fractions, 20 01 08 biodegradable waste from kitchens and canteens; and in the subgroup 20 02 Garden waste and park waste, 20 02 01 biodegradable waste.

Also, it must be emphasized that in the by-laws, regulating the landfill and operation of the landfills,

- Rulebook on the conditions regarding the technical means and the equipment for performing the activity of waste disposal, as well as the conditions and the manner of training and training of the employees, "Official Gazette of the Republic of Macedonia" no. 108/09,
- Rulebook on the conditions to be met by landfills, "Official Gazette of the Republic of Macedonia" no. 78/09,
- Rulebook on criteria for acceptance of waste in landfills of each class, preparatory procedures for acceptance of waste, general procedures for testing, sampling and acceptance of waste, Official Gazette of the Republic of Macedonia no. 8/08,
- Rulebook on the manner and procedure for operation, monitoring, operation and control of the landfill during operation, as well as monitoring and control of the landfill in the closure phase and further care of the landfill after the closure, as well as the manner and conditions for the care of landfills after they will cease to operate, "Official Gazette of the Republic of Macedonia" no. 156/07,
- Rulebook on the form and content of the request for the establishment of a landfill for non-hazardous and inert waste, "Official Gazette of the Republic of Macedonia" no. 133/07,

there are also provisions that apply to biodegradable waste. They regulate the manner of receipt, treatment and disposal of this waste at landfills, as well as the conditions that they should meet in terms of reducing the impact on the environment.

There are other legal and sub-legal acts, as well as strategic documents that touch the issue of biodegradable waste management, but are not important for this paper and will not be considered in the interest of preserving space.

4. Conclusion

Biodegradable waste represents a large part of the municipal waste that is deposited in a landfill. The disposal of unprocessed biodegradable waste has significant adverse effects on the environment in terms of greenhouse gas emissions and pollution of surface and groundwater, soil and air.

Although Directive 1999/31 / EC already sets the targets for the diversion of landfills for biodegradable waste, it is necessary to introduce additional restrictions for the disposal of biodegradable waste, i.e. a strict prohibition on the disposal of biodegradable waste separately collected for the purpose of its processing in an appropriate installation , in accordance with Directive 2008/98 / EC.

Looking at the legal framework, we can conclude that R. Macedonia has largely harmonized its legislation with that of the EU. What is evident is that there is no integrated biodegradable waste legislation in the EU and in Macedonia. The fragmentation of legislation at international and national level adversely affects efforts to establish an economically viable biodegradable waste management system.

The goals for establishing such a system in Macedonia, unlike those in the EU, are set far away, which certainly negatively affects the progress in the implementation of the legal framework.

The lacks of criteria for the quality of materials (compost, digestat) that appear as a product from the treatment of biodegradable waste also adversely affect the national level. Although at EU level there are no established quality standards for compost, such standards exist in several EU Member States, which contributes to the high level of biodegradable waste processing in them, as well as the establishment of a market for these products, which in its turn to a large extent contributes to the development of the overall industry in this area and establishes the foundations for an economically environmentally sustainable system.

According to the above, it is necessary to complete the legal framework at both the EU and the Republic of Macedonia. Macedonia.

What is particularly important in the Republic of Macedonia? Macedonia is completing the legal framework in this area with the quality standards for compost, as well as decisive goals for separate collection and treatment of the biodegradable fraction of municipal waste, which will certainly have a positive impact on the economy of the same, but also on reducing the negative impacts on the environment caused by improper biodegradable waste management.