

WASTE MANAGEMENT IN KOSTINBROD AREA

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ABSTRACT. The goals of this doctrine encompass the municipalities of the Regional waste management administration Kostinbrod, including the municipalities: Kostinbrod, Bozhurishte, Svoge, Slivnitsa, Godech and Dragoman and intend to decompose the running condition of waste management. The main struggle and matters that appear for municipalities in the implementation of the regulations at the local level are related to the realization of the set goals in the Waste Management law (legislation). It is obligatory to decrease the deposited quantities by 50% of the total general weight of waste materials including: paper, paperboard, metal, plastic and glass from the housekeeping

Keywords: waste, management, environment.

УПРАВЛЕНИЕ НА ОТПАДЪЦИТЕ В РЕГИОН КОСТИНБРОД

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РЕЗЮМЕ. Целите на настоящото проучване обхващат общините от Регионалното сдружение за управление на отпадъци Костинброд, включващо общините: Костинброд, Божурище, Своге, Сливница, Годеч и Драгоман и целят да се анализира съществуващото състояние по управление на отпадъците. Основните трудности и проблеми, които възникват пред общините при прилагането на нормативната уредба на местно ниво са свързани с изпълнението на поставените цели в Закона за управлението на отпадъците. Необходимо е да се намалят депонираните количества с 50% от общото тегло на отпадъчните материали, включващи хартия и картон, метал, пластмаса и стъкло от домакинствата.

Ключови думи: отпадък, управление, околна среда.

Introduction

The article discusses the prerequisites for creating a system for separate collection of green and/or biodegradable waste and construction of installations for their processing, as well as an installation for pre-treatment of mixed municipal waste in the **Kostinbrod Regional Waste Management Association**.

To this end, the waste management practices in the area are presented and an alternative related to the reduction of the quantities intended for disposal, which meets the requirements of the legislation and is cost-effective.

As an outcome of taking measures to establish the system and with the development of technologies for repair, an increasing part of the landfilled waste will be able to be re-incorporated into the production of new products by using them as an alternative raw material and power source and increasingly -small part will be deposited.

The mechanism and equipment will also make an important input reducing the unsafe properties of waste, reducing the risk to human health and restricting the noxious effects on the environment engendered by the straight disposal of waste during the life cycle of the landfill.



Fig.1. Administrative map of Sofia Region
Source: National Statistical Institute

Priorities, objectives and conformities in waste management in Bulgaria

The Waste Management Law (WML) introduces the requirements of the Waste Framework Directive 2008/98/EU into the Bulgarian legislation and regulates the measures and control for the protection of environment and human health by preventing or reducing the harmful effects of waste generation and management, as well as by reducing the overall impact of resource use and by increasing the efficiency of that use. According to Article 52 of the WML: Municipalities must develop and implement waste management programs for the territory of the respective municipality for a period that should coincide with the period of validity of the National Waste Management Plan and the National Waste Management Program as its essential part, and to develop them in accordance with the structure, objectives and provisions of the NWMP (Waste Management Law 2012). In addition, the WML requires that municipal waste management programs shall include the necessary measures to meet the obligations of municipalities resulting from this law.

According to the national targets, the share of disposed biodegradable waste should be reduced to 35% and the quantity of recycled waste should be increased to 50% by 2020. The National Waste Management Plan (NWMP) provides for achieving a regional target for separate collection and recovery of municipal bio-waste – not less than 50 percent of the quantity of municipal bio-waste generated in the region in 2014 (National Waste Management Plan 2014).

To prevent the generation of municipal waste (MA) in Bulgaria, regulatory and economic instruments are used – deductions for waste disposal; producer responsibility schemes for specific waste streams/product charges/royalties to organizations for the recovery of widespread waste (WsW); municipal waste fee; fee for limiting the use of polymer bags with certain parameters.

The Operational Program "Environment 2014 – 2020" provides to contribute to the implementation of the country's commitments in the "Waste" Sector and the achievement of the objectives arising from European and national legislation. The criminal proceedings initiated against the country for non-compliance with Directive 1999/31/EC on the waste disposal has also been taken into consideration.

The Waste Sector is financed through Priority Axis 2 of the Operational Program "Environment", financed by the European Regional Development Fund. The objective of the priority axis is to achieve consistency with the waste management hierarchy (Directive 2008/98/EC) and with the objectives of national legislation. According to the hierarchy, priority is given in the sector to measures aimed at reducing the quantity of deposited municipal waste by reuse, recycling and recovery.

Current situation/Practices in waste management in the Municipalities in the Kostinbrod Regional Waste Management Association

The study shows that currently the municipalities in the Kostinbrod Regional Waste Management Association: Kostinbrod, Bozhurishte, Godech, Slivnitsa, Dragoman and Svoge deposit their municipal waste at a regional landfill, complying with the regulatory requirements, with a valid

Complex Permit but there is no installation for pre-treatment of municipal waste and/or composting installation, as required by the national legislation in the field of waste management.

The waste generated by the Kostinbrod Regional Waste Management Association is mainly non-hazardous waste. Mixed non-hazardous household waste, production waste from companies engaged in production activities, green waste from households, maintenance of green areas, parks, gardens, and construction waste from repair and construction works are generated. The existing practice in the municipalities of Kostinbrod Regional Waste Management Association, as well as in all municipalities in the Republic of Bulgaria is waste disposal when deposited at landfills.

According to data provided in recent years by the National Statistical Institute (NSI, www.nsi.bg), the trend is to reduce the total quantity of disposed waste in the country.

The reports kept over the years in the municipalities of this area show that waste is significantly increasing due to the developing economy and production activities, and the variety of products that are a serious generator of waste after consumption is increasing at the market.

The main index in defining municipal waste is the accumulation rate (Table 1), showing the quantity of waste generated by one person for a certain period of time, usually a year. The accumulation rate can be expressed in weight (kg/year/per capita) or in volume units (m³/year/ per capita).

Table 1. Accumulation rate by groups of settlements

Inhabitants	Over 150 000	50 – 150 000	25 – 50 000	3 – 25 000	Under 3 000
kg/year/per capita	410,3	349,6	334,9	295,5	241,7

The average accumulation rate for the municipalities of the Kostinbrod Regional Waste Management Association for the last 5 years is 592.08 kg/year/per capita, which is higher than the average for the country (375 kg/year/per capita).

The morphology of the generated waste from the municipalities in the area shows that the most serious share is reported in green and food waste (Table 2) as only the Bozhurishte Municipality is an exception where the percentage of generated inert waste is the highest.

The municipalities of the Kostinbrod Regional Waste Management Association have implemented effective systems for organized waste collection in their settlements by placing containers. The vessels are replaced and supplemented, if necessary. The special machinery for their service is provided by the respective municipalities. The number of placed waste containers is calculated according to the "Guide for determining the number and type of necessary containers and machinery for waste collection and transportation", developed by the Ministry of Environment and Water (MEW).

The municipalities have organized the separate collection of larger waste streams on their territory. They have organized independently and/or in cooperation with organizations using various waste collection systems. They also manage to implement the new legal requirements for their activities.

There is still a lack of infrastructure in their territories for the treatment of plant and biodegradable waste.

Table 2. Morphological composition of waste in the municipalities of Kostinbrod Regional Waste Management Association for 2016

Fraction	Unit	Kostinbrod Municipality	Svoege Municipality	Slivnitsa Municipality	Godech Municipality	Bozhurishte Municipality	Dragoman Municipality
Municipal waste, Total							
Paper and cardboard	%	17.49	14.71	7.69	10.01	6.91	5.71
Plastics	%	12.83	12.18	6.68	9.89	7.31	2.13
Glass	%	3.28	5.17	3.92	6.82	8.24	2.45
Metal	%	3.81	1.85	7.11	2.65	3.57	0.52
Wood	%	4.48	6.97	2.62	2.65	1.71	5.51
Rubber	%	1.24	1.69	0.09	0.28	0.32	0.35
Textiles and leather	%	3.82	3.92	2.28	3.3	4.25	1.66
Hazardous municipal waste	%	2.14	0.75	0.24	1.28	0.09	0.35
Inert waste	%	11.27	9.55	8.97	20.15	33.74	7.95
Food waste	%	17.19	19.89	6.02	10.42	13.26	5.45
Green waste	%	22.45	23.32	54.38	32.55	10.69	67.93

On the territories of the municipalities there is no installation for pre-treatment of waste/separation.

Currently the sludge from the Wastewater Treatment Plant (WWTP) is in small quantities and the construction of infrastructure for their treatment would be inexpedient. It is advisable to look for an option for another recovery that is economically feasible.

Possibilities for reducing the quantity of deposited waste

According to Article 38, paragraph 1 of Ordinance No. 6 dated 27.08.2013 on the conditions and requirements for construction and operation of landfills and other facilities and installations for recovery and disposal of waste at landfills, pre-treated waste is accepted (Ordinance No. 6/2013). In accordance with the definition of "*polluter pays*", the costs of pre-treatment are borne by the persons in whose activities they are incurred.

The pre-treatment of mixed municipal waste generated by households is the responsibility of the Municipal Administration, as the population pays a "Municipal Waste Fee" for them. The responsibility for the treatment of other waste generated outside the organized system of waste collection and disposal lies with the perpetrators and their owners.

According to § 1 of the above-mentioned Ordinance No. 6, "Pre-treatment" means all physical, thermal, chemical or biological processes, including sorting, that change the characteristics of waste in order to reduce its volume or hazardous properties in order to facilitate further treatment or to increase the waste utilization.

The pre-treatment aims at separating recoverable components from the total waste stream before their final disposal or preparation for recovery. Through separation, the volume of waste for disposal is significantly reduced, which extends the service life of landfills.

The analysis of the need for the construction of additional infrastructure for pre-treatment of mixed municipal waste proves the need for the construction of such, as:

1. The objectives under Article 31, paragraph 1, item 1 of the WML shall not be achieved at regional level. The systems for separate collection, reuse, recycling and recovery of municipal waste shall ensure at least the fulfilment of the following objectives:

- by January 1, 2020 at the latest, preparation for re-use and recycling of waste materials, including paper and cardboard, metal, plastics and glass from households and similar waste from other sources of not less than 50 percent of the total weight of this waste
 - by December 31, 2020 at the latest, limiting the quantity of deposited biodegradable municipal waste to 35 percent of the total quantity of the same waste generated in the Republic of Bulgaria in 1995.
2. The targets for limiting deposited waste quantities by 2020 must be met.
3. There is no infrastructure developed for pre-treatment of the mixed collected municipal waste at municipality level and at area level, which has a capacity guaranteeing the fulfilment of the set objectives.

Conclusions

In accordance with the set national and European objectives for reducing the quantities of deposited waste and based on the presented data on their management in the municipalities of Kostinbrod Area, the following conclusions are imposed:

- It is necessary to implement a system for separate collection of green and biodegradable waste on the territory of the Municipalities and construction of composting plants for biodegradable and/or green waste;
- The pre-separation of the mixed collected municipal waste will separate the recoverable components from the total

flow and at the same time will reduce the quantities intended for depositing. In this regard, the construction of a pre-treatment plant will also extend the service life of the existing regional landfill;

- It is necessary to take action on the treatment of construction waste in the region. The establishment of a temporary storage site will greatly facilitate their further management.

The construction of a pre-treatment installation for mixed municipal waste and composting installations, as well as waste management measures will contribute to reducing the environmental impacts caused by the generated waste, improving resource efficiency, increasing the responsibilities of polluters, and stimulating investment in the field of waste management.

References

Directive 1999/31/EC (in Bulgarian)

Directive 2008/98/EC (in Bulgarian)

Guide for determining the number and type of necessary containers and machinery for waste collection and transportation, Sofia, 2011 (in Bulgarian)

National Statistical Institute (www.nsi.bg) (in Bulgarian)

National Waste Management Plan 2014 – 2020 (in Bulgarian)

Ordinance No. 6 dated 27.08.2013 on the conditions and requirements for construction and operation of landfills and other facilities and installations for recovery and disposal of waste at landfills, pre-treated waste is accepted, MEW, amended and supplemented No. 13 of 07.02.2017 (in Bulgarian)

Waste Management Law, Promulgated in State Gazette, issue 53 of July 13, 2012, amended and supplemented in State Gazette, issue 81 of October 15, 2019 (in Bulgarian)