

# ATTITUDE TO BULKY WASTE AND ITS MANAGEMENT IN ŠIAULIAI

Violeta Petraškienė, Deividas Nesovas  
Šiauliai State College, Lithuania

## Annotation

*Waste management system is a complex system characterized by large amounts of generated waste and a variety of waste types. Despite the progress made in the area of sustainable development since Rio de Janeiro Summit in 1992 and after The Johannesburg Summit in 2002 a lot of waste management issues still need to be resolved. This article discusses one of the waste management system parts - bulky waste and the situation of this waste management in Šiauliai town municipality. The results of this research are considered as the basis for resolving issues concerning bulky waste management.*

**Key words:** bulky waste, questionnaire survey, bulky waste management sites.

## Introduction

The world population annually increases by about 80 million [12]. The rate of consumption is growing rapidly in both developed and developing countries. All this inevitably increases the growth of various waste quantities, changes in waste management systems and their negative impact on the Earth's ecosystem, which is no longer able to fully compensate for the consequences of human activity.

Waste management, as the activity of educating people and nation as the whole is rising questions of what to do with waste and how to manage it, has been developing gradually. In the past century, waste management was only associated with the collection and disposal of waste, but technologies have also improved with the changing age. As technologies improved and amount of waste is ever-increasing, the aim of the waste systems had to change from "collecting and disposing" to "reducing the amount of waste to be disposed" (Fig.1). [3].

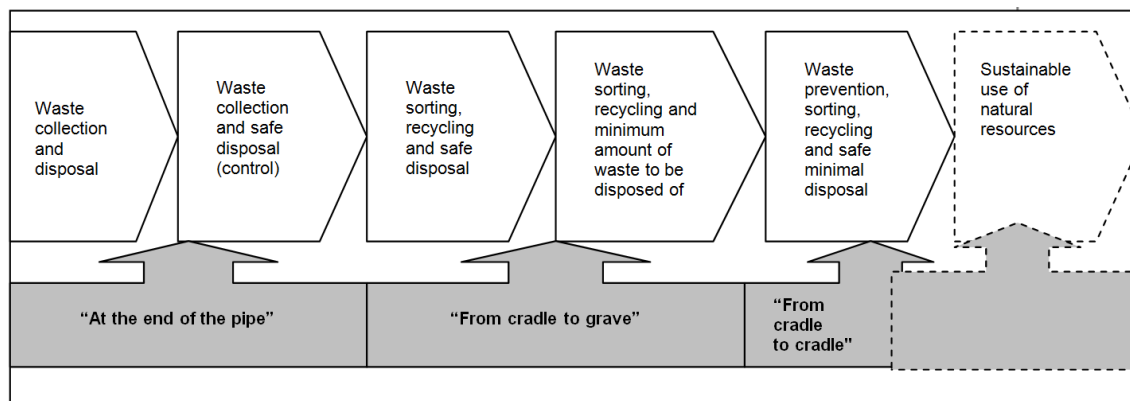


Fig.1. Change of waste systems

Thus, it's evident that sorting of secondary raw materials as well as sorting of bulk waste (after sorted waste can be reused) occurs when new components take part in the changing waste management system. When the waste management begins to be linked to the management of natural resources, then the aim becomes to maximize the conservation of natural resources, because not all natural resources are renewable.

Kan (2009) states that waste management elements seek to replace all raw materials with the recycled materials, collect information on materials needed to be recycled for further use, promote the reuse of waste, and properly distribute them on the storage sites as well as to create a flexible waste management system [13].

Vaišnoras (2011) puts emphasis on the importance of the waste management at the place of waste origin - sorting, storage and reuse [19].

Thus, waste management is a complex process that starts with the control of the generation of waste, the storage of waste, collection, transportation, transfer of waste to collectors or processors, the recycling, reuse and its disposal.

### **Waste management policy**

European Union legislation and directives as well as the legal documents of the Republic of Lithuania have established priorities, principles, and measures to be followed in waste management in order to prevent emerging threats to human health and the environment. Waste management policy is based on administrative and economic measures. To this end, the European Parliament and Council adopted Regulation 2150/2002/EC on waste statistics, which allows for the collection and transfer of regular and comparable data on waste in EU countries Eurostat to The EU Statistical Office, and the collected statistics enables monitoring and evaluation of the implementation of EU waste policy. This statistics is needed to assess and identify the links between data on the generation of waste and information on usage of regional, national and global resources [6].

Changes in waste management are also closely related to EU waste legislation. The main legal act in this area is The Waste Framework Directive, which describes the waste management hierarchy: starting with prevention, preparation for reuse, recycling and disposal. The aim is to minimize the generation of waste and use the resulting waste as a resource and to minimize the amount of waste sent to landfills [5]. The Waste Framework Directive Together with other EU waste directives (end-of-life vehicles [7], waste of electrical and electronic equipment [8], waste batteries and energy reservoirs [9], packaging waste [10], etc.) specific goals are envisioned, for example: the amount of the municipal waste to be recycled in each EU country by 2020; 45% of batteries should be collected by 2016 and 70% of non-hazardous construction or demolition waste should to be recycled or recovered by 2020.

Lithuania has developed a waste management system based on the following key principles:

- The waste management system should be based on the hierarchy of European waste management principles, focusing first and foremost on a more fundamental principle. Three key waste management priorities were identified: waste avoidance, usage and safe disposal.
- The efficiency of the waste management system directly depends on the application of the principles of proximity and adequacy [1]. It is one of the basic principles of waste management, which states that waste must be treated and disposed of as close as possible to the place of waste origin [11].

The main law on waste management in Lithuania is the Law on Waste Management. This law establishes general requirements for waste prevention, recording, collection, storage, transportation, usage and disposal in order to avoid the negative effects of waste on human health and the environment, as well as the key principles of organization and planning of waste management systems. According to this law, the general requirements for waste management rules were detailed. They define precisely the terms related to waste management that meet the requirements of the European Union. The procedure for collection, storage, transportation, usage, disposal, recording, identification, declaration, sorting and marking of waste is detailed here [14].

Another no less important document in the field of waste management is the Law on Pollution Tax. The main purpose of this law is to encourage the pollutants to reduce pollution of the environment by means of economic measures, not to exceed the norms and to acquire appropriate environmental tools from the collected tax money [15].

In order to increase the efficiency of the waste management system, the National Waste Management Plan for 2014-2020 was approved. This plan outlines key guidelines on how the country's waste will be managed in the next few years. The plan declares that municipalities are responsible for organization of the municipal waste management systems necessary for the management of municipal waste in their territories and ensuring the functioning of these systems. The waste management goal is set in the National Waste Management Plan - to ensure the principle of universality when providing a public waste management service [20].

To ensure the implementation of the goals set in National Waste Management Plan for 2014 - 2020. Šiauliai Regional Waste Management Plan for 2014 - 2020 was developed for Šiauliai region. The plan states that Šiauliai Regional Waste Management Center is responsible for coordination of implementation of Šiauliai Region Waste Management Plan for 2014 - 2020. This plan is also being implemented by all the municipalities of Šiauliai region - Akmenė district, Joniškis district, Kelmė district, Pakruojis district, Radviliškis district, Šiauliai district and Šiauliai town. The plan also states that all waste holders are provided with a public municipal waste management service that meets the minimum quality requirements set by the Ministry of Environment of the Republic of Lithuania [17].

### **Current bulky waste management situation in Šiauliai region**

The provision of a waste management service for each waste holder ensures that all municipal waste generated in the Šiauliai region is collected and managed. Container waste

collection system is used for collection of mixed municipal waste. Since 2009 all mixed municipal waste collected in Šiauliai region is transported for disposal only to the non-hazardous waste landfill in Šiauliai region, located in Jurgeliškiai village, Šiauliai district. Sorted municipal waste (tires, household renovation waste, electrical and electronic equipment) from municipal waste holders in Šiauliai region is accepted free of charge at 34 waste collection points and 9 bulky waste collection sites. In addition according to the established schedule municipal waste carriers periodically collect hazardous household, electrical and electronic equipment, used tires from the residents and deliver them to the bulky waste collection site. The collection and acceptance of this waste is announced in elderships, local press, television, Šiauliai Regional Waste Management Center, municipal websites, flyers and in other media [20].

**The object of the research** - management of bulky waste.

**The aim of the research** - to reveal how residents actually handle bulky waste.

**Research objectives:**

1. To evaluate the attitude of the residents of Šiauliai town to bulky waste management.
2. To determine ways of information presentation about bulky waste management and sites.
3. To determine what information is lacking for residents about bulky waste management.

**Research methods**

The most popular and most widely used research method is *questionnaire survey*. Thanks to this method with little means a large number of respondents can be interviewed in a short term.

The Questionnaire consists of a group of interrelated questions that require answers from respondents questioned. The content, quantity and order of the questions depend on the objectives of the study. During the questionnaire, the respondent is provided with a fixed set of questions in which each selected person answers same questions following the same pattern. The purpose of the questionnaire is not to find out the individual's opinion, but to determine a general description of the whole population.

The questionnaire was prepared to evaluate the attitude of the inhabitants of Šiauliai town regarding the management of bulky waste. The questionnaire was designed in such a way as to get as precise answers as possible to the research questions of interest, and to help respondents to answer them as clearly as possible without rising additional questions. During the compilation of the questionnaire the recommendations and requirements for creation of the questionnaire were considered: questions in the questionnaire were written in the correct language easily understood by everyone, not offensive to the respondent, and most importantly, the questions asked were reflecting the real reality and the content of the problem under investigation [16].

The study material was processed by summing, calculating and comparing the data presented in the questionnaires. All data is reported in EUR millions as percentage.

**Analysis of the research results**

As far as waste management is concerned, the public awareness of waste management seems to be increasing, but often it is unfortunate to see various type of waste scattered around containers - old furniture, construction and demolition waste, household appliances, tires, etc. All these no longer usable items should be delivered to specially designated sites or points for that purpose or placed in special containers to be disposed of.

**Description of respondents**

150 respondents answered the questionnaire of which 96 were women and 54 were men. The respondents by age distributed as follows: the small part is made up by respondents up to 30 years old, and the rest (more than 68%) respondents 30-70 years old. According to respondents' place of residence the majority of respondents live in multi-apartment buildings - 72% and 28% live in private houses. According to education the data distributed as follows: the majority of respondents have higher education - 48%; secondary education - 30%; higher education - 14%; and basic education - 8%.

**Attitude to what is a bulky waste.** Since respondents are of various ages and backgrounds, it can be assumed that each of respondents has different perception of bulky waste definition. Most of Šiauliai town inhabitants (92.3%) believe that bulky waste is bulky household appliances, 82.7% think that it is furniture, 75% - doors, 71% - windows and 63% think that it is construction and reconstruction waste.

**Attitude to bulky waste management.** Respondents expressed their opinion on the management of bulky waste as follows: they take waste to a bulky waste disposal site (43.3%),

leave by the container (38.4%), and 18,3% leave by the container on bulky waste collection day.

**Attitude to bulky waste management sites.** With the expansion of municipal waste management system bulky waste disposal sites were equipped. They are an important part of an entire waste management system. The purpose of these sites is to provide residents with universal, accessible and high-quality public municipality waste management services. Respondents expressed their opinion on bulky waste management sites as follows: 75% of respondents know where they are and use them and 25% - do not know where there are or do not use bulky waste disposal sites. One of the reasons why respondents do not use bulky waste collection sites is lack of transport.

The comments of Šiauliai town respondents, regarding what would encourage them to deliver waste to the bulky waste collection site are presented in Table 1.

Table 1

What would encourage the delivery of waste to a bulky waste disposal site

Place of residence	Comments
Šiauliai town	payment for delivered waste
	more information
	longer working hours of sites on weekends
	reward for delivery
	having no transport to deliver waste to the site
	lack of information
	lower fee for waste

**Attitude to information presentation about bulky waste management and sites.** Analyzing the ways of information presentation about bulky waste, its processing and existing waste collection sites, it was determined that the most suitable ways of presenting information to the inhabitants of Šiauliai are the following: local press - (priority 1), programmes on this topic on TV (priority 2), information flyer ( Priority 3), online media (Priority 4) and social network Facebook (Priority 5).

**Attitude to the dissemination of information on bulky waste collection and sites.** Very little waste is currently being collected at bulky waste disposal sites. Many of these sites are newly built, which means that inhabitants have little information about them, as well as information regarding what waste is admitted is lacking. Respondents' opinion distributed as follows: The inhabitants of Šiauliai lack information mostly about where there is the site (priority 1), which waste is accepted at the site (priority 2), what amount of waste can be delivered (priority 3), where to dispose / deliver waste (priority 4), whether there is a fee for delivered waste (priority 5), what is a bulky waste (priority 6) and the working time of the site (priority 7).

### Conclusions

1. In order to find out how bulky waste is managed in Šiauliai, a questionnaire survey was conducted with 150 respondents interviewed. After analyzing the collected data, it was determined that only 43.3% of inhabitants deliver generated bulky waste to the bulky waste collection site, 38.4% leave by the container, and 18,3% leave by the container on bulky waste collection day.

2. The research showed that the most suitable ways of conveying of information presentation to the inhabitants of Šiauliai are the following: local press - (priority 1), programmes on this topic on TV (priority 2), information flyer (Priority 3), online media (Priority 4) and social network Facebook (Priority 5).

3. Very little waste is currently being collected at bulky waste disposal sites. Many of these sites are newly built, so it can be assumed that the population has little information about them. The inhabitants of Šiauliai lack information mostly about where there is the site (priority 1), which waste is accepted at the site (priority 2), what amount of waste can be delivered (priority 3), where to dispose / deliver waste (priority 4), whether there is a fee for delivered waste (priority 5), what is a bulky waste (priority 6) and the working time of the site (priority 7).

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