

Secondary Materials Management in Latvia: Challenges and Possibilities

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Abstract—This research paper is dedicated to an actual issue in Latvia and in the whole European Union – development of the secondary materials management. The goal of this paper is to research the development of the secondary materials management in Latvia as a result to point out its main positive aspects and problems. In this research paper the author regards following issues: significance of the secondary materials management, current situation of the waste generation and utilization in Latvia comparing with other EU Member States, main problems and positive aspects of the secondary materials management in Latvia. The research author concludes that in last ten years a great work is done to develop the secondary materials market. Nevertheless following improvements are necessary: implementation of the packaging deposit system, development of the separate waste collection, increasing of the recycling capacity.

Keywords—sustainable development, secondary materials, separate waste collection, packaging deposit system.

I. INTRODUCTION

ACCORDING to the Roadmap to a Resource Efficient Europe presented by the European Commission in September 2011 the development of the secondary materials market is one of the priorities of the European Union. In 2013/2014 the European Commission will stimulate the secondary materials market and demand for recycled materials through economic incentives and developing end-of-waste criteria within the European Union. In this paper the author researches the current situation of the development of secondary materials management in Latvia as a result finds out the main challenges and possibilities of the secondary materials market. In paper following research methods are applied: Eurostat data analysis on the generated waste and packaging waste in the EU Member States, the study of the legislative acts, e.g. the European Council Directive 75/442/EEC on waste and the EU Directive 94/62/EC on packaging and packaging waste, Packaging Law of the Republic of Latvia as well the research of literature and research papers in the field of secondary materials management.

II. SECONDARY MATERIALS MANAGEMENT IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT

In 1987 in the report “Our Common Future” of the United

Nations World Commission on Environment and Development headed by Gro Harlem Brundtland the first time the concept of sustainable development was developed.

Nowadays the term “sustainable development” became very popular and often used. There are many definitions of this term, but the most often-quoted is the definition used by the Brundtland Commission: “sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” [14]. Sustainable development is characterized by three interrelated dimensions: environmental, economic and social. A fundamental challenge of sustainable development is to deliver massive improvements in resource efficiency and not to cause unacceptable levels of environmental degradation [1].

Latvian Sustainable Development Strategy has been prepared and approved by the Cabinet of Ministers on 13 August 2002. One of the policies of the Latvian Sustainable Development Strategy is the management and reduction of waste. The main objectives of the policy are following: limitation of the waste generation by reason of economic growth, the ensuring a considerable reduction of the total amount of waste generated by increase in the efficiency of the use of resources and encouragement of more prudent consumer behavior as well providing that the most part of the waste is returned in the economic circulation, in particular, by recycling, having therefore developed the packaging recycling systems, or returned in the environmentally friendly (e.g., compost) or harmless form [13].

It is to note that on one hand according to the Article 1 of the European Council Directive 75/442/EEC on waste the term “waste” means any substance or object which the holder disposes of or is required to dispose of on the other hand waste is potential secondary material, from which new goods are produced [4].

Eurostat defines “secondary materials” as recovered waste materials which are to be sold and reused in manufacturing [8]. New goods production from secondary materials saves limited natural resources, energy, water and financial resources in comparison to the production from new raw materials. For example 1 ton of glass fragments makes it possible to save 1 ton of quartz sand and 250 kilograms of soda ash [9]. Addition of 10% glass waste to the glass raw material reduces energy consumption by 2.5%. By burning of 1 ton plastic it is possible to receive so many calories as by burning of 1 ton oil. From

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recycled PET the food packaging and industry goods are produced, for example the polyester fiber and cobble bricks. 1 ton of waste paper saves on average 4 m³ of wood [10].

It is to conclude that secondary materials are recovered waste materials. Waste management is considered as one of the factors of the sustainable development, which insures a healthy environment and preservation of natural resources. In the next part of this research paper the current state of the waste management in Latvia is analyzed and compared with other EU Member States.

III. WASTE MANAGEMENT IN LATVIA

The total produced waste volume per person in kilograms in the EU Member States in 2008 is presented in Fig.1 [6].

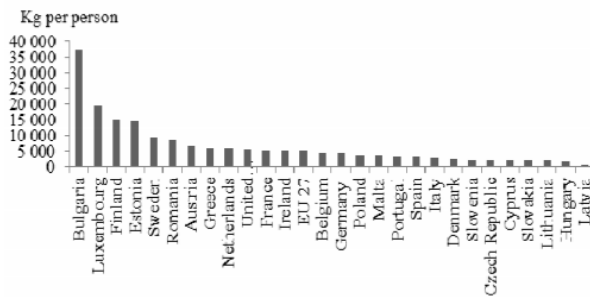


Fig. 1 Generation of waste per person in kg in the EU in 2008

It is to note that the latest Eurostat data on the generation of total waste produced in the EU Member States are available for the year 2008. According to the Eurostat data in 2008 Bulgaria has produced the largest volume of waste per capita – 37528 kilograms and Latvia the smallest – 660 kilograms, the average of 27 EU Member States was 5237 kilograms per capita. By analyzing the data a great difference between the produced waste volume per capita in Latvia and the average in 27 EU countries is observed. The paper author supposes that the statistical data on the total produced waste per capita in kilograms in Latvia differ from the real situation due to the poor accounting and registration system of the total waste volume in Latvia particularly in the rural area. The author concludes that the accounting and registration system of the total waste volume in Latvia has to be improved.

Fig. 2 represents the data provided by the Eurostat on the municipal waste volume per capita in kilograms produced in the EU Member States [6]. Municipal waste consists to a large extent of waste generated by households, but may also include similar wastes generated by small businesses and public institutions and collected by the municipality.

Comparing with other EU Member States Latvia has produced the smallest amount of the municipal waste per person in kilograms – 304 kilograms, the largest amount was produced in Cyprus – 760 kilograms and the average of 27 EU Member States was 502 kilograms per person.

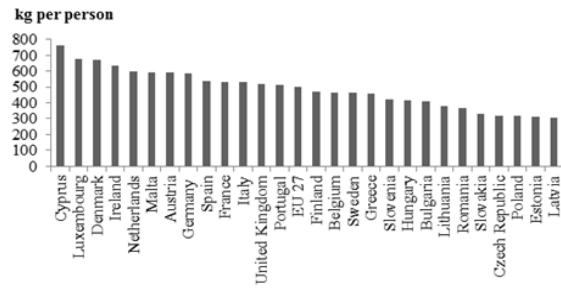


Fig. 2 Generation of municipal waste per person in kg in the EU in 2010

By analyzing the secondary materials management in Latvia it is important to identify the recycling rate of the municipal waste. Based on the Eurostat data [6] the paper author has calculated the recycling rate of the municipal waste in the EU Member States, which is presented in Fig. 3.

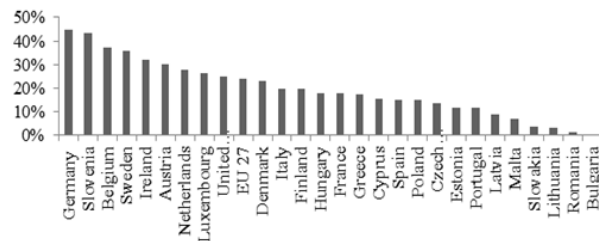


Fig. 3 Recycling rate of the municipal waste in the EU Member States in 2010

Fig. 3 shows that in 2010 the highest recycling rate of the municipal waste was in Germany – 45% and the lowest in Bulgaria 0% and Rumania 1%. Latvia was on 22nd place. In 2010 in Latvia only 9% of the municipal waste was recycled. The data confirm that in 2010 a big part of the municipal waste in Latvia was still landfilled. In general the highest recycling rate of the municipal waste was in the “old”(15) EU Member States and in the “new” (12) EU Member States the municipal waste recycling rate was much lower. Such situation can be explained by well-developed waste management system, including the separate waste collection as well by well-developed recycling system and recycling capacity in the “old” EU Member States. It is to emphasize that “old” EU Member States had to implement the European Council Directive 75/442/EEC on waste and the European Parliament and Council Directive 94/62/EC on Packaging and Packaging Waste into the national legislative acts much earlier than “new” EU Member States that contributed to the earlier development of the waste including packaging waste management system in the “old” EU Member States.

IV. PACKAGING WASTE MANAGEMENT IN LATVIA

Nearly 30% of municipal waste makes packaging waste[11].

The Fig. 4 represents the data on the packaging waste volume per capita in kilograms produced in the EU Member States provided by the Eurostat [7]. The data on Malta are not available.

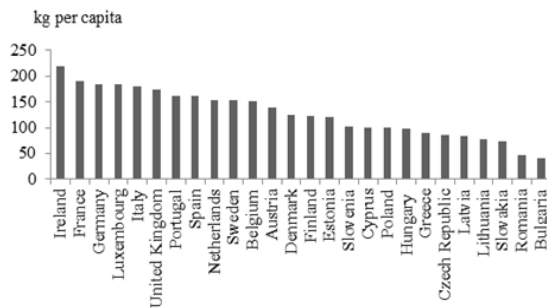


Fig. 4 Generation of packaging waste per capita in kg in the EU in 2009

The data provided by the Eurostat show that the largest volume of generated packaging waste per capita in kilograms in 2009 was in Ireland – 218 kilograms, the smallest in Bulgaria – 40 kilograms. In Latvia 83 kilograms of packaging waste per person was produced. In comparison to other EU Member States it is one of the smallest packaging waste amounts.

For reduction of total and landfilled packaging amount and increase of the reuse and recycling of packaging the European Parliament and Council Directive 94/62/EC on Packaging and Packaging waste was adopted. According to the Directive 94/62/EC the EU Member States must attain the following targets [5]: at least 60 % by weight of packaging waste must be recovered or incinerated at waste incineration plants with energy recovery and between 55% and 80 % by weight of packaging waste must be recycled. Additionally following targets for materials contained in packaging waste must be attained: 60 % for glass, paper and cardboard packaging; 50% for metal packaging; 22.5 % for plastic and 15 % for wood packaging must be recycled. The 15 “old” EU Member States had to reach the above mentioned goals already until 2008. Latvia has to reach this goal till 2015. Annually the EU Member States provide the information to the European Commission on the recovery and recycling targets achievements, e.g. in 2011 the Ministry of Environmental Protection and Regional Development of the Republic of Latvia has submitted to the European Commission the report on the packaging recovery and recycling in 2009 in Latvia. Fig. 5 (a) and 5 (b) represents the data of the Eurostat on the recovered and recycled rate of the packaging waste in 26 EU Member States (the data on Malta are not available) and average in 27 EU Member States estimated by Eurostat in 2009 [7].

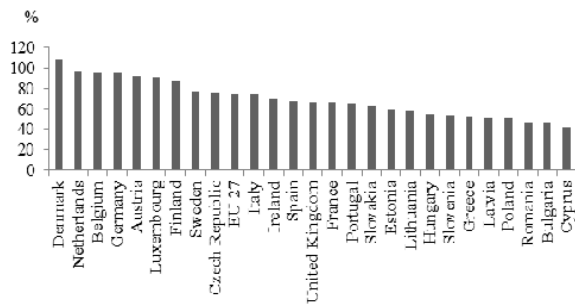


Fig. 5 (a) Packaging waste recovery rates in the EU in 2009

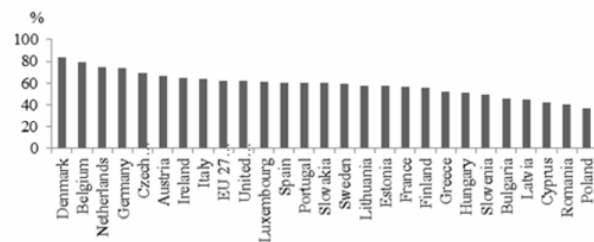


Fig. 5 (b) Packaging waste recycling rates in the EU in 2009

In 2009 the packaging waste recovery rate in Latvia was 51.1% and the recycling rate was 44.9% of the total produced packaging volume. Thereby it is to conclude that in 2009 the recovery and recycling requirements defined in the Directive 94/62/EC on Packaging and Packaging waste were not fulfilled in Latvia. The data represented in Fig. 5 (a) and 5(b) confirm that in comparison to other EU Member States the packaging waste recovery and recycling rate in Latvia is one of the lowest. The figure shows that the recovery and recycling rate in Latvia lags significantly behind the average rate of the EU (27) Member States which was 74.6% for recovery and 62.4% for recycling.

In Table I the data on the packaging waste material in Latvia from 2006 till 2009 is presented [7].

TABLE I
GENERATED PACKAGING WASTE PER CAPITA IN LATVIA IN 2006 - 2009

Waste material	Packaging waste generated							
	2006		2007		2008		2009	
	kg	%	kg	%	kg	%	kg	%
Paper and cardboard	36	27	51	36	37	31	26	31
Plastic	18	13	17	12	17	15	14	17
Wood	43	32	37	26	28	24	20	23
Metal	9	6	7	5	6	5	4	5
Glass	29	22	30	21	30	25	20	24
Total	134	100	142	100	117	100	83	100

The data of the Table I show that the total packaging volume has decreased since 2007 in Latvia. The decrease can be explained by two factors: by decrease of the GDP per capita in Latvia (in 2006 – 4915 euro per capita, in 2007 – 5434 euro, in 2008 – 5226 euro, 2009 – 4308 euro [2]) and of people purchasing power as a result of economic crises as well by the EU and Latvian regulations of packaging management which require paying the Nature Resources Tax for every kilogram of generated packaging or ensuring the recovery and recycling of the generated packaging. By analyzing the packaging waste composition in Latvia it is to notice that in 2009 almost 1/3 of the total packaging amount was paper and cardboard packaging, then follows glass, wood and plastic packaging. In comparison to 2006 in 2009 the percentage of the paper, cardboard and plastic packaging has increased by 4 % and the percentage of wood packaging has significantly decreased.

V. MAIN PROBLEMS OF SECONDARY MATERIALS MANAGEMENT IN LATVIA

A. Separate waste collection

Separate waste collection is the collection when a waste stream is kept separately by type and nature so as to facilitate a specific treatment in waste management system. The separate waste collection is one of the most significant factors for the reduction of the total landfilled waste volume as well for the increase of the waste volume which can be recycled and secondary used. It is to note that in Latvia the first separate waste collection projects were implemented in 1994 in the capital of Latvia – Riga in cooperation with the Danish Environment Protection Agency. Although the separate waste collection system was introduced in Latvia 18 years ago and a lot of work was done for the improvement of the system, the separate waste collection in Latvia is not enough developed.

The main problems connected with the separate waste collection are following: the shortage of the separate waste collection containers and the shortage of residents' motivation to separate waste. Separate municipal waste collection points are not available everywhere. It is an usual situation that not all four containers, namely, for plastic, glass, paper and for other waste are available at the waste collection points of the apartment buildings. At some multi –apartment buildings separate waste collection containers are not available at all. Often the containers for other waste are full and the residents of multi-apartment buildings throw their generated waste into the container foreseen for the recyclable waste. Just at some sorted waste collection points the bio waste containers are available.

Availability of the separate waste collection points in Latvia depends also on the area, i.e. in big towns, e.g. Riga, the separate waste collection system is more developed than in small living areas.

In last years waste (packaging waste) management companies like the JSC "Latvian Green dot" have done a great work for the education of population by explaining the waste

management importance and necessity. Nevertheless many residents in Latvia are not motivated to collect separately their produced waste because they are not enough informed about the separate waste collection importance, they have no separate waste collection point close to place of their residence and they are not financially motivated to collect waste separately.

B. Implementation of Packaging Deposit System

One of the measures for reduction of the total landfilled waste volume and for increase the reuse and recycling of the waste is the implementation of the packaging deposit system. Such system functions in many countries of the European Union, e.g. in Germany, Austria, Finland, Sweden and Estonia. According to the 18 section of the Packaging Law of the Republic of Latvia a producer of goods who utilises reusable packaging shall establish a packaging deposit system. A consumer, when buying packaged goods for which a deposit system has been applied, shall pay a specified amount of money – deposit payment. Upon receiving this packaging back from the consumer, the seller shall repay the deposit to the consumer according to the procedures and in the amount specified by the Cabinet [12]. It is to note that at present packaging deposit system in Latvia is voluntary and it does not function because the implementation of the system is connected with additional costs of merchants and beverage packers. However the statistical data on the waste volume collected during the Big Clean-up which annually is organized in Latvia confirm that 80% of the collected waste is glass, PET (Polyethylene terephthalate) bottles and tins. By implementing the mandatory deposit system on reusable and disposable packaging from glass, plastic and metal gradually the waste volume in the forests, roadsides etc. will significantly decrease.

At the same time the implementation of mandatory packaging deposit system will change a rather negative attitude of the people living in Latvia toward the collecting and giving back to the special collection points of the glass, PET bottles and tins. At present there are some glass bottles collecting points in Latvia where it is possible to receive on average 0.02 LVL (2.9 euro cents) or 0.03 LVL (4.3 euro cents) depending on the collection point for the used (beer) glass bottle. There is a prejudice that mostly poor people, homeless and alcohol addicted collect the used bottles and give them for some money to the collection point.

In order to solve this problem the Ministry of Environmental Protection and Regional Development of the Republic of Latvia has developed the concept on the implementation of the beverage packaging deposit system. The concept includes four scenarios of the deposit system implementation. The difference of these scenarios is the implementation date and the issue whether the deposit system on the reusable and disposable beverage packaging will be implemented at the same time. The concept was discussed several times at the State Secretaries Meetings but the decision has not been made yet. At present the concept is discussed in the working party where the

representatives from several ministries of the Republic of Latvia, social partners, e.g. the Latvian Merchant Association, the Employers' Confederation of Latvia and other institutions who are concerned by this issue take part. 1 January 2015 is discussed as a possible beverage packaging deposit system implementation date.

C. Waste Recycling

As it was mentioned in the IV part of this research paper Latvia is the country where the recovery and recycling rate of the total produced packaging amount is one of the lowest between all EU Member States. A great part of the packaging waste is sent abroad for its further recycling. The paper, cardboard and glass waste is exported mainly to Lithuania and Ukraine. Nevertheless there are some relative big waste recycling companies in Latvia, e.g. JSC "PET Baltija" the PET bottles recycling company, which from used PET bottles produces PET flakes. The company pays for the used PET bottles from 250 EUR till 450 EUR per ton depending on the bottles color. "Paper mill "Līgatne"" Ltd. is the major paper fiber recycler in Latvia. The ferrous metals are recycled by JSC "Liepājasmetallurģis" – the metallurgical company leading its history since 1882. It is to conclude that although the waste recycling capacity has increased in last ten years in Latvia it is still insufficient.

VI. CONCLUSION

1. Waste management is considered as one of the sustainable development factors, which insures a healthy environment and preservation of natural resources.
2. The accounting and registration system of the total waste volume in Latvia is poor and has to be improved.
3. In 2010 in Latvia only 9% of the municipal waste was recycled. It is one of the lowest results between the EU Member States. The data confirm that a big part of the municipal waste in Latvia was still landfilled.
4. In 2009 in Latvia 83 kilograms of packaging waste per person were produced. In comparison to other EU Member States it is one of the smallest packaging waste amounts.
5. The packaging waste recovery and recycling rate in Latvia is one of the lowest between the EU Member States: in 2009 the recovery rate was 51.1% and the recycling rate was 44.9% that is significantly less than is required by the EU Directive 94/62/EC on Packaging and Packaging waste.
6. Separate waste collection in Latvia is not enough developed i.e. the separate waste collection containers are not available everywhere and there is a shortage of residents' motivation to separate waste.
7. One of the measures for reduction of total landfilled waste volume and for increase of the waste reuse and recycling is the implementation of the packaging deposit system. At present packaging deposit system in Latvia is voluntary and it does not function.
8. Although the waste recycling capacity has increased in last ten years in Latvia it is still insufficient. Therefore there are many business possibilities for the recycling companies.

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