MUNICIPAL WASTE MANAGEMENT ISSUES

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Aim of study

The aim of the study is twofold:

1) to evaluate the current state and trends of municipal waste management in Latvia, which are aimed to fulfil EC recommendations and EU legislation, as well as to reach on EU level accepted objectives and targets of waste related policies;

2) to assess Latvian households' attitudes and behaviours regarding to the municipal solid waste management.

Materials and methods

The principal materials used for the studies are as follows: the legislation and documents of institutions (mainly EU); different publications and papers, e.g. scholars' articles, research articles and reports; the data from Eurostat online database.

For evaluation and comparison the state and trends regarding to the waste management among countries, the data of the EU Member States and eight EU countries of Baltic Sea Region: Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden, as well as the Baltic States were evaluated.

The suitable qualitative and quantitative research methods have been used for various solutions in the process of study: analysis and synthesis, data grouping, correlation-regression, logical and abstractive constructional etc.

Materials and methods (cont.)

For the evaluation of Latvian households' attitudes and behaviour regarding to environment, including the waste handling and treatment, especially of bio-waste, the survey was conducted in March 2016.

The respondents (n=1009) were selected using a random, multi-stage sample design. Face to face interviews were performed in respondents' homes.

In order to in-depth assessment of Latvian households' attitudes and behaviour regarding to the environment, *inter alia*, waste sorting or separating, survey in two cities: Liepaja (n=361) and Valmiera (n=373) with the confidence interval - 5%, was conducted in September and October 2016.

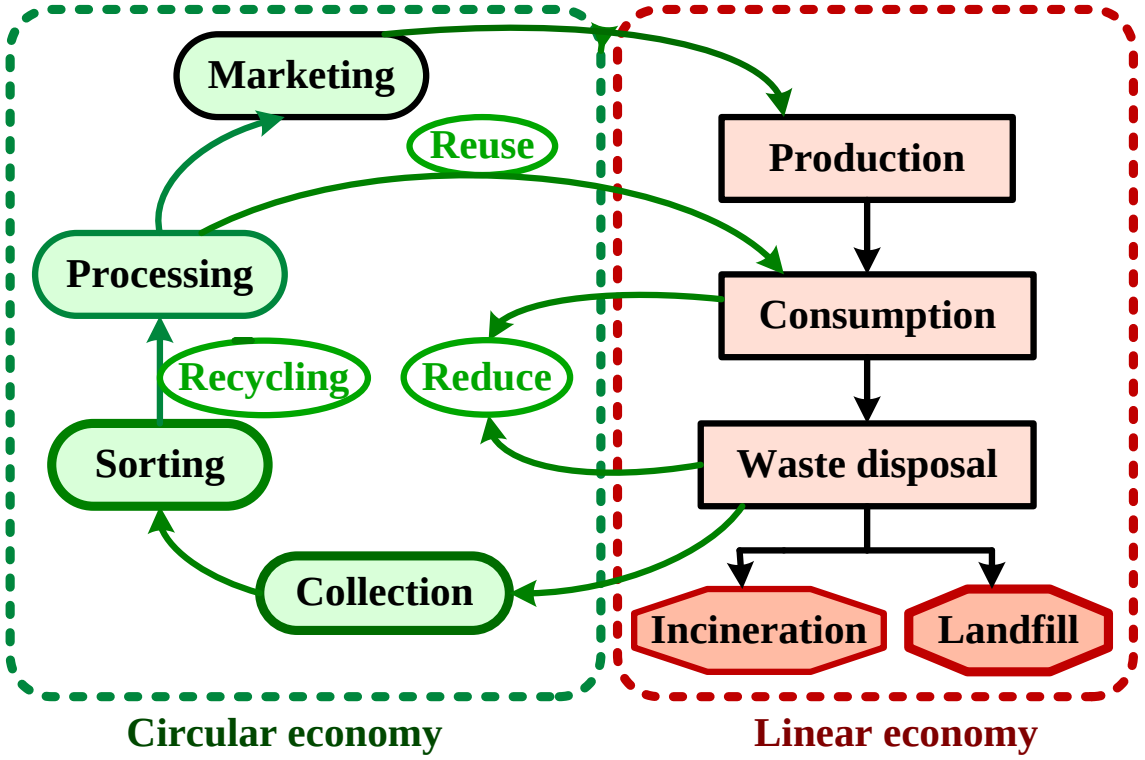
Materials and methods (cont.)

The questionnaire structure was similar to the national questionnaire, but questions about societal values were replaced with questions about the residents' satisfaction with environmental services provided by municipalities.

The obtained data have provided useful information about drivers that influence households' (residents) attitudes and behaviour with respect to the environment (environment friendly behaviour), including waste management at household level.

The frequency distributions of questionnaires data (respondents' answers in survey) were performed with SPSS software.

Comparison between circular economy and linear economy



Directive 2008/98/EC requires Member States to adopt waste management plans and prevention programs, and that by 2020 each country must recycle 50% of their municipal waste. In July 2014 this target and deadline were updated by the EC which proposes legislation for increasing the amount to 70% by 2030.

Main horizontal measures recommended by EC in Action plan of Roadmap for Latvia to help fulfil waste legislation and its implementation

Measure (M) and description	Expected result	Implemented
M 1: Increase progressively the current landfill tax (in combination with awareness raising) Increase progressively and differentiate the current landfill tax to higher total costs for landfilling than for alternative treatment.	Reduced untreated landfilled waste; improved collection and treatment of biodegradable waste, etc.	No
M2: Introduce tax on MBT* Introduce tax on MBT (analogue to landfill tax but at a lower rate)	Prevent negative incentives for recycling.	No
M 3: Restrictions/ban on landfilling municipal waste Impose a ban on landfilling biodegradable waste (in case sufficient collection & alternative treatment capacity available).	Nearly zero landfilled biodegradable waste; increase in bio-waste composting or anaerobic digestion.	No

* - mechanical-biological treatment.

Main horizontal measures recommended by EC in Action plan of Roadmap for Latvia to help fulfil waste legislation and its implementation

Measure (M) and description	Expected result	Implemented
M 4: PAYT scheme** Implement PAYT. Develop proper compensation mechanisms (e.g. rich urban would pay for less developed rural areas).	Significant increase in recycling	No
M 5: EPR* schemes** Improve the performance of EPR schemes for the main waste flows (i.e. glass, plastics, paper and metal) to achieve higher re-use and recycling rates. Establish a deposit refund systems for packaging (plastic, metal, glass).	Improved performance of EPR for main waste flows, and deposit refund systems	In preparation

** - pay-as-you-throw; *** - extended producer responsibility (EPR)

Municipal waste generated (kg per capita) in the Baltic Sea Region countries and EU-28 in 2005 and 2016, and changes between 2005 and 2016

Country	2005	2016	Changes, 2016/2005	
Denmark	736	777	6%	↑
Germany	565	626	11%	↑
Finland	478	504	5%	↑
EU-28	515	480	-7%	↓
Lithuania	387	444	15%	↑
Sweden	477	443	-7%	↓
Latvia	**320**	**410**	**28%**	↑
Estonia	433	376	-13%	↓
Poland	319	307	-4%	↓

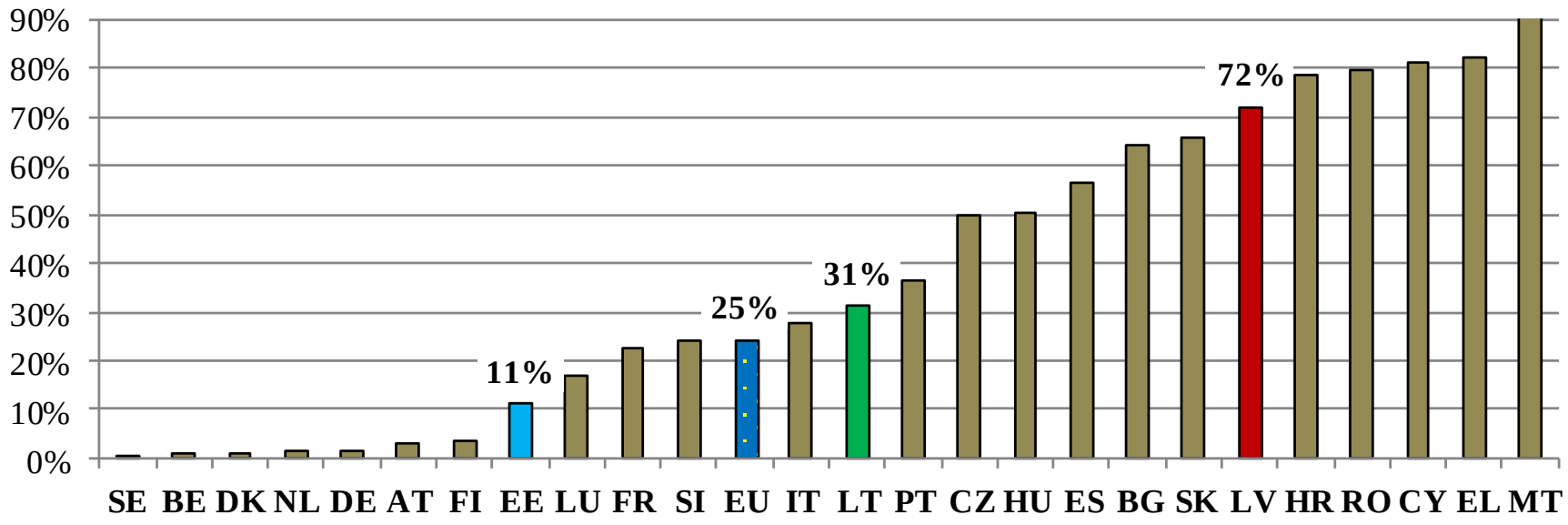
Latvia shows the highest raise – by 28%.

The rate of municipal waste by waste operations in Baltic Sea region countries and EU-28 in 2016

Country	Treatment	Landfilled	Incineration	Recycling	Composting*
EU-28	98%	25%	28%	**30%**	17%
Denmark	100%	1%	51%	29%	19%
Germany	100%	1%	31%	48%	18%
Estonia	91%	**11%**	**53%**	**28%**	**3%**
Latvia	**89%**	**72%**	**0%**	**17%**	**11%**
Lithuania	95%	**31%**	**18%**	**26%**	**25%**
Poland	100%	36%	20%	28%	16%
Finland	100%	3%	55%	29%	13%
Sweden	100%	1%	50%	33%	16%

*- i.e. digestion

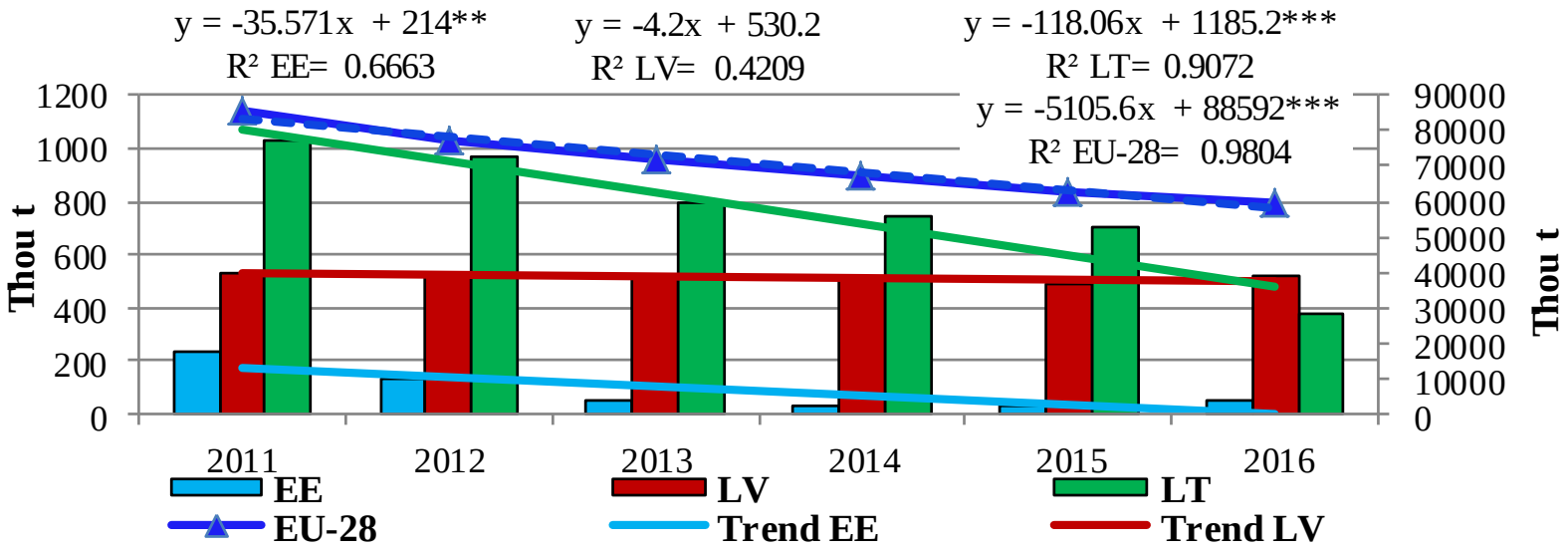
The rate of landfilled municipal waste in the EU Member States, 2016



Latvia with 72% of the landfilled municipal waste occupies the sixth higher position among EU Member States.

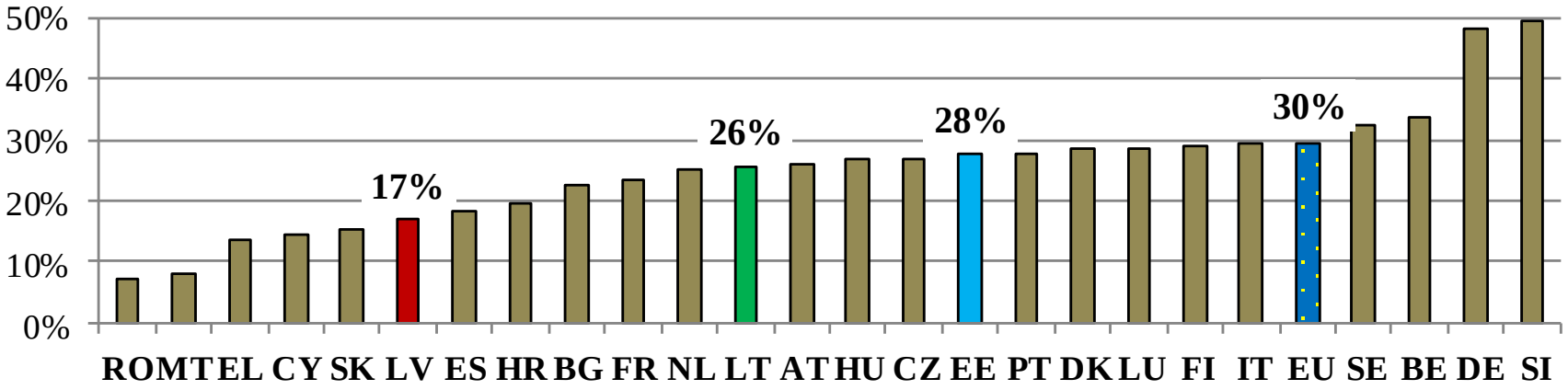
This rate is almost three times higher than the EU average, 6.5 times higher than in Estonia, and 2.3 times higher than in Lithuania.

Trends of landfilled municipal waste in the Baltic States and EU-28, 2011-2016

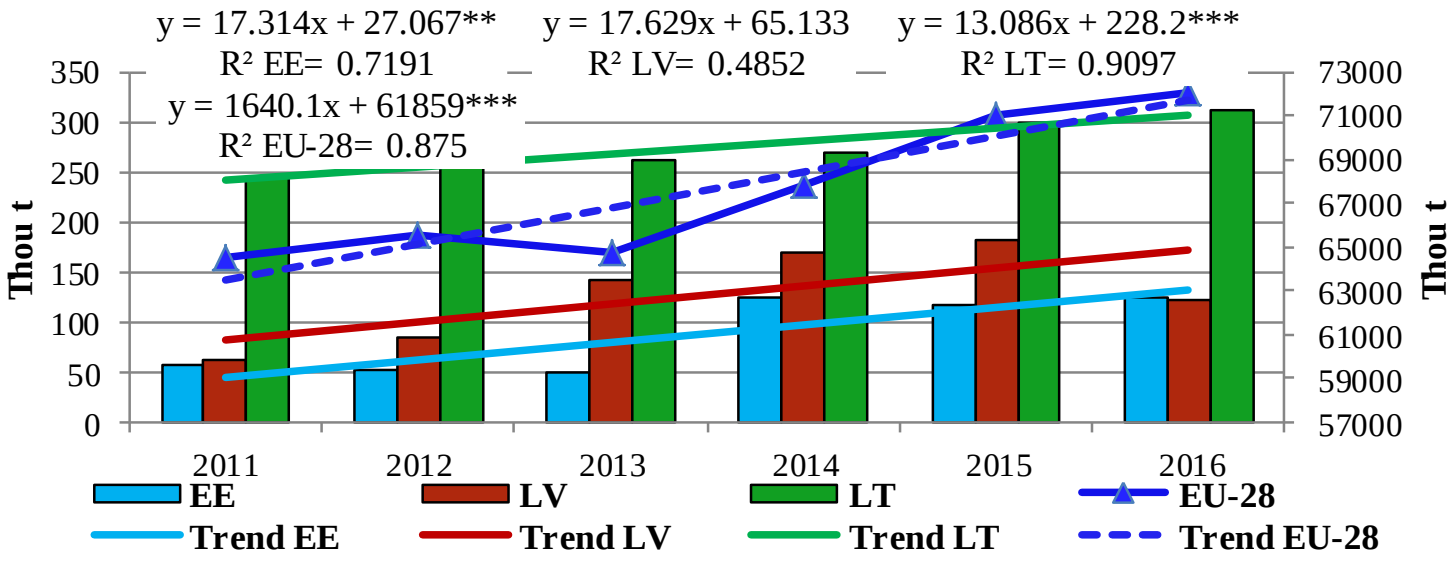


** - α<0.05; *** - α<0.01

The rate of recycled municipal waste in the EU Member States, 2016



Trends of recycled municipal waste in the Baltic States and EU-28, 2011-2016



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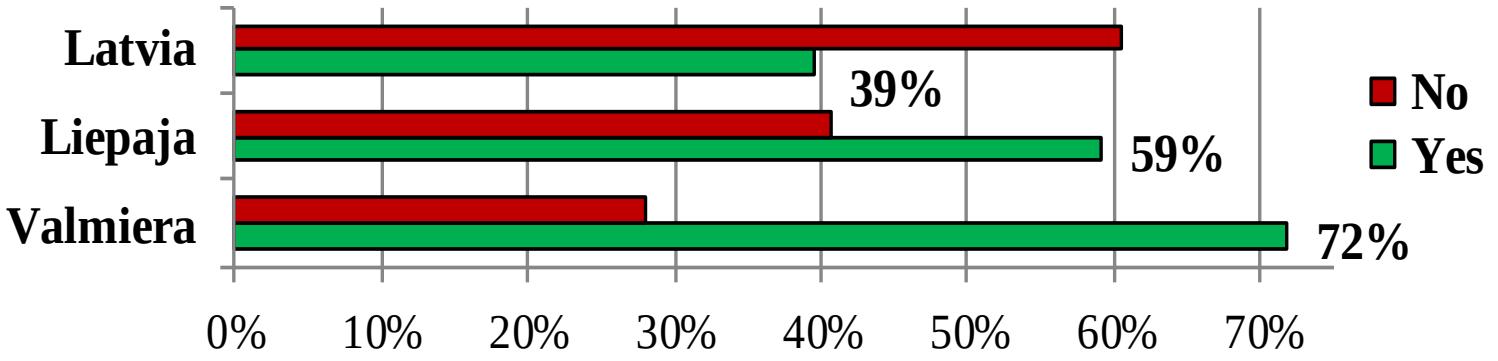
Households' behaviour for sorting and separating solid waste, 2016



The reasons why Latvian households not sorting the waste

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 It is not necessary	33	3.3	5.5	5.5
	2 It is cumbersome	102	10.1	17.0	22.5
	3 No containers	**333**	**33.0**	**55.4**	**77.8**
	4 Not thought about it	124	12.3	20.6	98.5
	99 Do not know	9	0.9	1.5	100.0
	Total	601	59.6	100.0	
Missing	System	408	40.4		
Total		1009	100.0		

Respondents' opinion (%) regarding necessary improvements to be made by municipalities in Liepaja and Valmiera

Necessary improvements	Liepaja	Valmiera
To provide better infrastructure, including waste sorting containers	**53.4%**	**50.7%**
Better arrangement of public transport	20.3%	19.3%
To implement sustainable consumption and to support households for it	48.6%	20.6%
Communication and more information how to do it	21.8%	23.9%
More monitored resources usage, and to stimulate households for changes	25.1%	46.1%

Main conclusions

Despite some improvements, the necessary progress regarding the waste management in Latvia is not reached.

The value of indicators of Latvian municipal waste management are still significantly below the EU average, the Baltic Sea region countries and other Baltic States.

Previous and current activities and efforts of government institutions are not effective enough for fulfilment of EU recommendations and solving the shortcomings in the waste legislation due to the harmonisation with EU requirements.

Main conclusions

The findings show that households (residents) are more environmentally concerned.

They have a relatively high level of pro-environmental behaviour regarding to the waste handling and sorting:

- the sorting of waste is the most popular environmentally friendly household's practice;
- more than the half of households outlined the necessity of appropriate infrastructure - containers for separated waste disposal.

Acknowledgments

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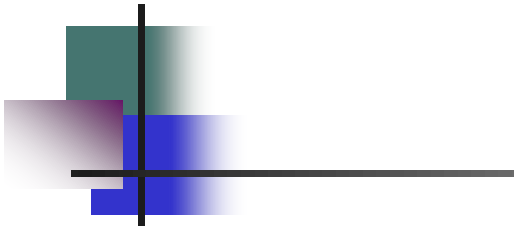

Thank you for attention!