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How to achieve the goal set for reduction of bio- waste disposal at landfills by 2020: the Baltic States' experience

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The research area

The Baltic States



Source: www.mapcruzin.com

Aim of the research:

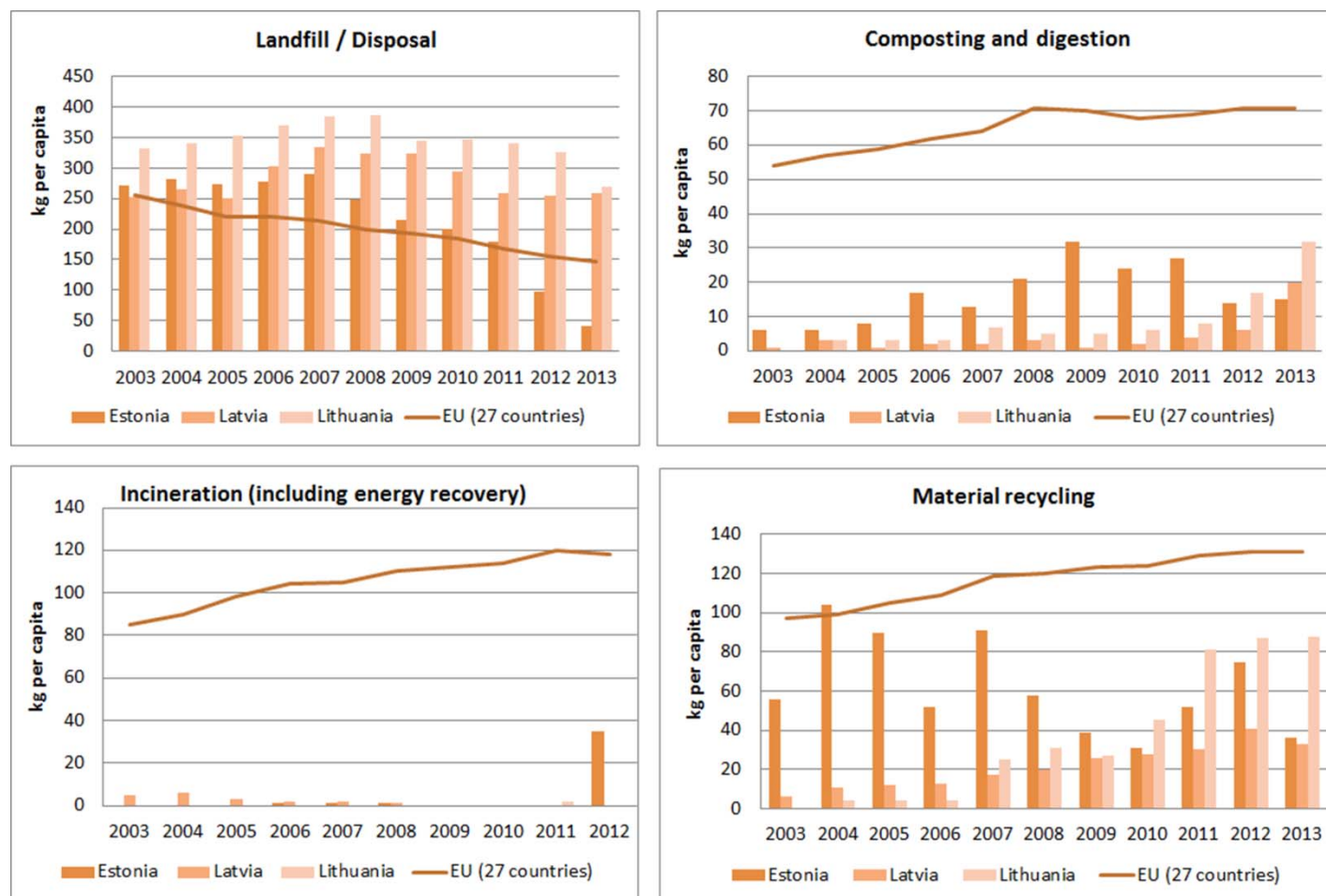
To examine the municipal waste management development strategies and the factors influencing the effectiveness of a policy of diverting biodegradable municipal waste (BMW) from landfill in the Baltic States (BS).

The Baltic States factsheet

Facts and indicators	Estonia	Latvia	Lithuania
Total area, thousands km ²	45, 100	64, 559	65, 300
Population in 2013, million	1, 325	2, 013	2, 956
Population density, capita km ⁻²	30 ~ 69 % of total urban population in 2010	35 ~ 68 % of total urban population in 2010	51 ~ 67 % of total urban population in 2010
A number of persons per household	2.4	2.6	2.5
GNI per capita in 2013, Atlas method (US\$)	\$17,690	\$15,280	\$14,900
Income level	High income: OECD*	High income: OECD*	High income: non-OECD
Life expectancy at birth in 2012, total (years)	76	74	74

*OECD - Convention on the Organisation for Economic Cooperation and Development

MW treatment performance in BS



Source: Eurostat, 2013

At that 1995 time, going to become the EU Member States, the BS were in a similar position – in all of them the disposed mass of solid waste exceeded 95% of the total collected amount.

Materials and methods

The main WM evaluation method:

- European Environment Agency (EEA) analysis method of the factors favouring or hindering the BMW diversion from landfill. This EEA was used – particularly in the context of Landfill Directive – for evaluation of approaches and policy instruments.
- For studying the national WM strategies was used the computer model based on the life cycle assessment (LCA) approach - *Waste management planning system* (WAMPS) software designed by the Swedish Environmental Research Institute (IVL)



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Factors related to the BMW landfill policy

Favouring / hindering factors	Estonia	Latvia	Lithuania
Landfill Directive 1999/31/EC transposed	WM Act adopted in 2004, last amendments 2015	WM Law adopted in 2001, last amendments 2010	Law on WM adopted in 1998, last amendments 2011
WM plans (WMPs) National /regional / municipal	National and municipal WMPs (can be done on a regional basis in cooperation with local governments). 213 municipalities.	National WMP (regional WMP was until 2013). 10 WM regions, 119 municipalities.	National WMP, regional and municipal level WMPs. 10 regional WM centres, 60 municipalities.
Landfill tariffs / gate fees for MSW in 2015 (incl. VAT and taxes), (euro tonne waste ⁻¹)	74.51	23.69– 53.43	25.62
Landfill tax on MSW in 2015, (euro tonne waste ⁻¹)	Introduced in 2005 29.84	Introduced in 2009, currently 12.00; 22,- in 2017	21.72, introduction from 2016 3.00 introduction from 2016; 21.72 in 2019
Prohibition of untreated waste disposal at landfill	The ban of landfilling the unsorted MW since 2008.	The ban of untreated waste; planned start 2015; (not yet defined for practice)	The ban of untreated waste starting 2013; (not yet defined for practice)
Selective ban on MBW	Landfilled MW must not exceed the following limits for MBW: <ul style="list-style-type: none"> • 45% by weight from 2010; • 30% by weight from 2013; • 20% by weight from 2020. 	The ban for disposing sludge of waste water treatment plants with water content > 80 % and waste of food and timber industry if not intended for composting or biogas generation. The ban of landfilling the MBW planned start 2017-2018	The ban of landfilling MBW from gardens, parks and greeneries since 2003.

Factors related to waste production and collection

Favouring / hindering factors	Estonia	Latvia	Lithuania
MSW generation per capita, (kg year ⁻¹)	311	367	381
Separate collection for BMW: <ul style="list-style-type: none"> • paper and cardboard (incl. newspapers etc.); • kitchen, garden and wood waste 	Mostly all municipalities provide separate collection	Separate collection not widely provided	157,899 composing containers (boxes) for home composting (distributed until 2012)
'Full cost' collection tariffs or charges, bio-waste (excl. VAT), (euro per volume)	6.12 -7.14 1.1 m ⁻³ for MWM (in Tallinn) 3.19 0.24 l ⁻¹ for MBW (in Tallinn)	3.29 – 20.00 1 m ⁻³ for MWM 7.93 -11.4 1 m ⁻³ for MBW	9,51 – 14,28; 1 m ⁻³ for MWM (Lithuania) 2.8 -8.38; 1 m ⁻³ for MBW

Bio-waste treatment in practice

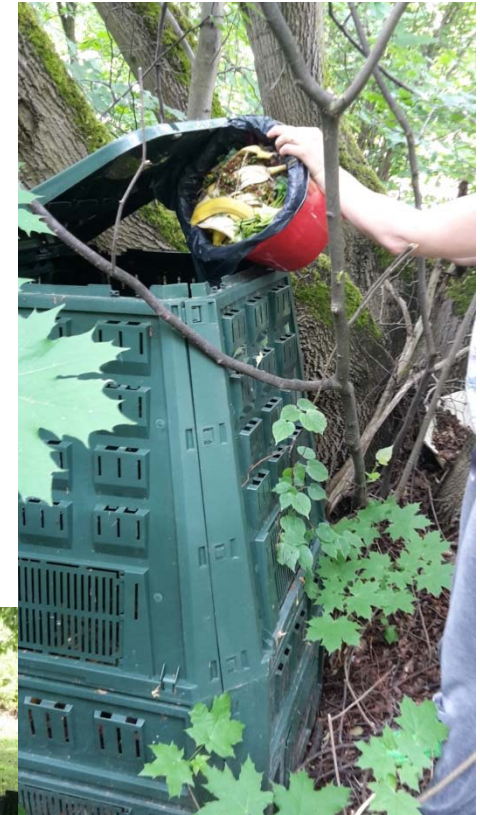


Lithuania: voluntary home composting:

municipality provides with free containers (boxes) for home composting



Latvia: voluntary home composting



Estonia: separately collected food waste collection system

According to the data from Tallinn Recycling Center, the share of other waste separated in the bio-waste is relatively large – 27%.



Factors related to the landfill sector

Favouring / hindering factors	Estonia	Latvia	Lithuania
Share of MSW landfilled in 2012 (ESI), %	44	84	79
Landfilled MW (non-hazardous waste) in 2013 (thousand tonnes year ⁻¹)	286	504	1 208
Landfills for non-hazardous waste	5 regional landfills	10 regional landfills	10 regional landfills

Factors related to the incineration sector

Favouring / hindering factors	Estonia	Latvia	Lithuania
Share of MSW incinerated in 2012 (ESI), %	19	0	1
Incineration capacity, (thousand tonnes year ⁻¹)	220 (O), 1 WfE plant (Tallinn) 100 (P), 1 WfE plant (Tartu)	250 (O), waste is co-incinerated at cement production plant (Brocēni)	420 (P), 2 WfE plants (Vilnius and Klaipėda)
Incineration gate fees for MSW (excl. VAT, incineration tax not applicable), (euro per waste tonne ⁻¹)	16-40	14	18.8

O- Operational

P - Planned

Factors related to the material recycling and recovery sector

Favouring / hindering factors	Estonia	Latvia	Lithuania
Packages and packaging waste policy	Obligatory deposit on refillable and non-refillable beverage packaging since 2005	Voluntary deposit (introduced in 2004 but not practised)	Deposit system for disposable packaging introduced in 2016
MBT capacity, thousand tonnes year⁻¹	300 (O), 4 MBT facilities	70 (O), 2 MBT facilities 400 (P), 2 MBT facilities 331,3 (O) unsorted MW sorting stations	1 036 (P), 9 MBT facilities
Compost capacity (i.e. input of bio-waste), thousand tonnes year⁻¹	16, 50 (O) several green waste composting sites, 1 composting site equipped for the kitchen waste	29,88 (O) 13 green waste composting sites (7 of them at landfills)	150 (P) 54 green waste collection sites

O- Operational
P - Planned

Conclusions

The results evidence that BS – though having similar economic and historical background – have different WM systems, defined mostly by political ability and efficiency.

Projection of environmental impact (by treated MW tonne) of the total currently operated and planned waste management infrastructure of each national WM strategy shows the savings on global warming:

- tonnes CO₂ eqv. 0.31 treated MW tonne⁻¹ in Estonia;
- tonnes CO₂ eqv. 0.07- treated MW tonne⁻¹ in Latvia;
- tonnes CO₂ eqv. 0.09 treated MW tonne⁻¹ in Lithuania.

The findings could be of help to local authorities in developing the own integrated WM systems at the municipal or regional level taking into account the ecological and economic considerations.

Comparison of measures taken in each country shows possible solutions for improvement of the national WM systems.

Thank you for your attention!



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