

Opportunities of symbiosis in Klaipeda region

Urban Baltic Industrial symbiosis

Vilnius

2019 10 09



Project and study goals

The goal of the project
“Urban Baltic industrial
symbiosis”

Reducing emissions through energy saving and efficient use. That will be achieved by project partners participating in symbiosis networks (5 pilot investment projects will be implemented)

During the project, Šilutė District Municipality installed five semi-underground container sites in Rusnė, containing four semi-underground containers in each site (household waste, glass, plastic, paper) (hereinafter – pilot investments).

Main goal of the study

To carry out an evaluation of the symbiosis possibilities of the waste collection system in the Klaipėda region, taking into account pilot investments. This study is carried out under the **Interreg South Baltic Program**

According to the project „Urban Baltic industrial symbiosis”, Šilutė District Municipality acquired 5 container sites in Rusnė town

Each container site contains 4 semi-underground containers for household waste, glass, plastic and paper. Even in the summer these containers have no smell, they are protected by fence and residents are given keys so that every apartment building has its own containers. That way citizens are motivated to sort their waste and witness the price of waste management decrease.



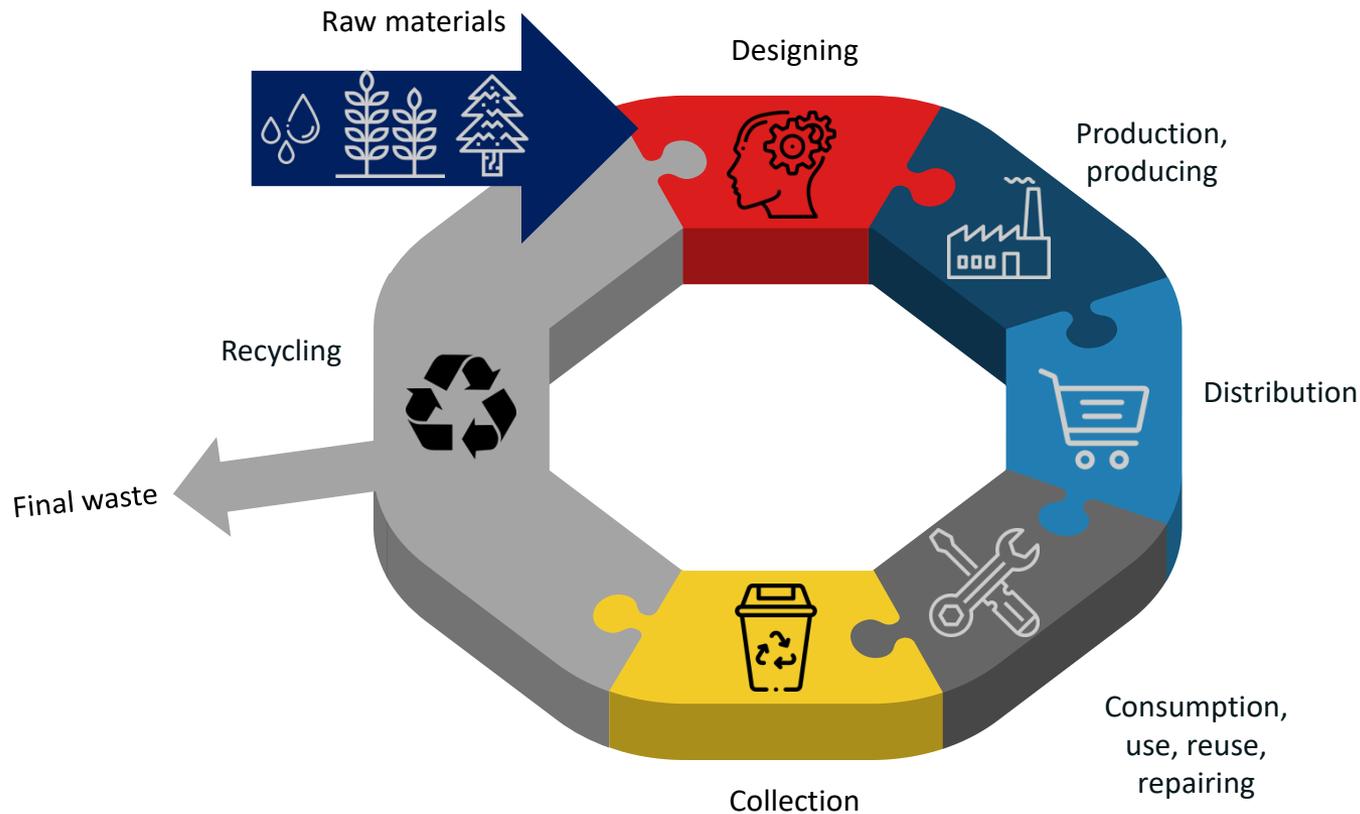
Increased sorting of waste also means getting closer to waste management and recycling targets of the EU.

Contents

1. Analysis of the situation in the Lithuanian waste sector
2. PESL and SWOT analysis
3. Analysis of the situation in Klaipėda region and Šilutė district municipality
4. Potential models of industrial symbiosis

The primary objective of the circular economy is to reduce the amount of waste disposed in landfills by recycling, reusing waste or recovering heat and electricity

Waste prevention, eco-design, re-use of waste and similar measures could save EU companies 600 billion euros in net funds, or 8% of annual turnover, and reduce overall greenhouse gas emissions by 2 to 4% per year.



Source: https://s3-eu-west-1.amazonaws.com/euoparl/circular_economy/circular_economy_lt.svg

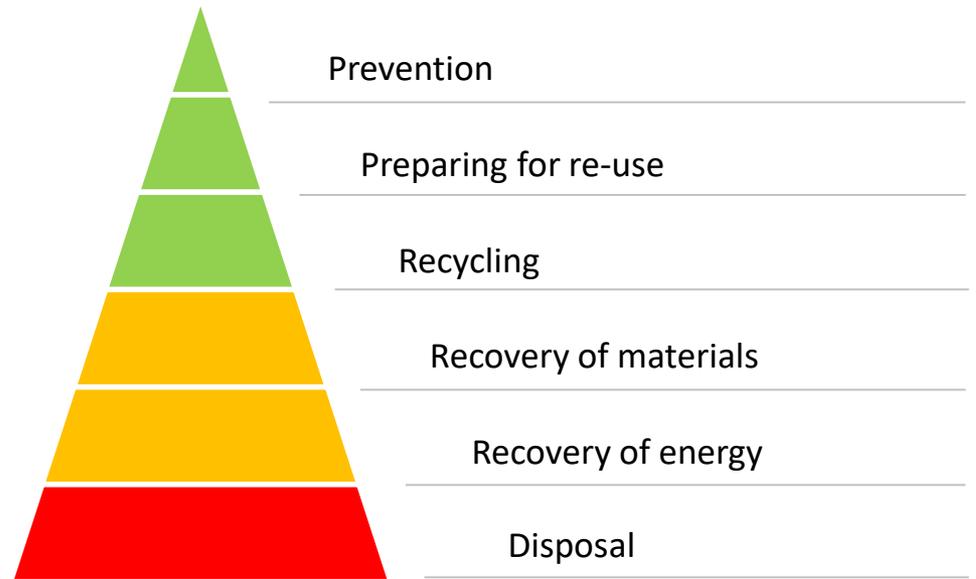
EU waste management rules set further recycling targets to be achieved by each Member State. Lithuania is already halfway to reaching these targets.

EU waste management targets:

These are the targets for municipal waste recycling rates:

- by 2025 – 55%
- by 2030 – 60%
- by 2035 – 65%
- no more that 10 % of municipal waste can be disposed in landfills by 2035;
- by 2030 it will be necessary to ensure that all waste suitable for recovery or recycling does not end up in landfills.

EU targets should be pursued on the basis of the hierarchical principle of waste recovery:

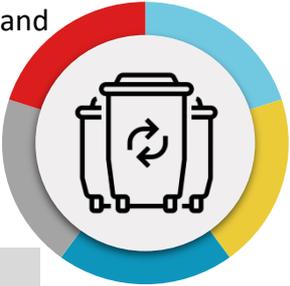


Lithuania is making progress towards EU waste management targets: the share of recycled and composted waste in 2018 made up 57.2% of all waste and 23.7% of all waste was disposed of in landfills. Biodegradable waste is already required to be disposed of in separate containers, and hazardous waste is transported to separate sites for disposal.

The legal / political environment in Lithuania focuses on the principles of the circular economy and encourages the reuse, recycling and recovery of waste rather than waste disposal

General strategies

National Sustainable Development Strategy and Lithuania's Progress Strategy Lithuania 2030



Sectoral strategies

Other relevant legislation in the waste sector

National Environmental Strategy

The aim is to reduce the amount of waste generated, to ensure the safe management of waste for human health and the environment, and to ensure the rational use of waste for energy purposes, thereby reducing landfill.

National Energy Independence Strategy

It is expected that heat production will be made more efficient by replacing old boiler plants, installing cogeneration biomass power plants and converting natural gas used for heat production into biomass.

National Climate Change Management Strategy

The target for waste sector is to use at least 30% of the annual amount of waste generated for energy production by 2020.

Waste Management Act

Establishes a hierarchical principle of waste management. Sets the goal to recover and recycle waste. Regulates waste management procedures, regional distribution, obliges regions to prepare waste management plans.

Environmental Pollution Tax Act

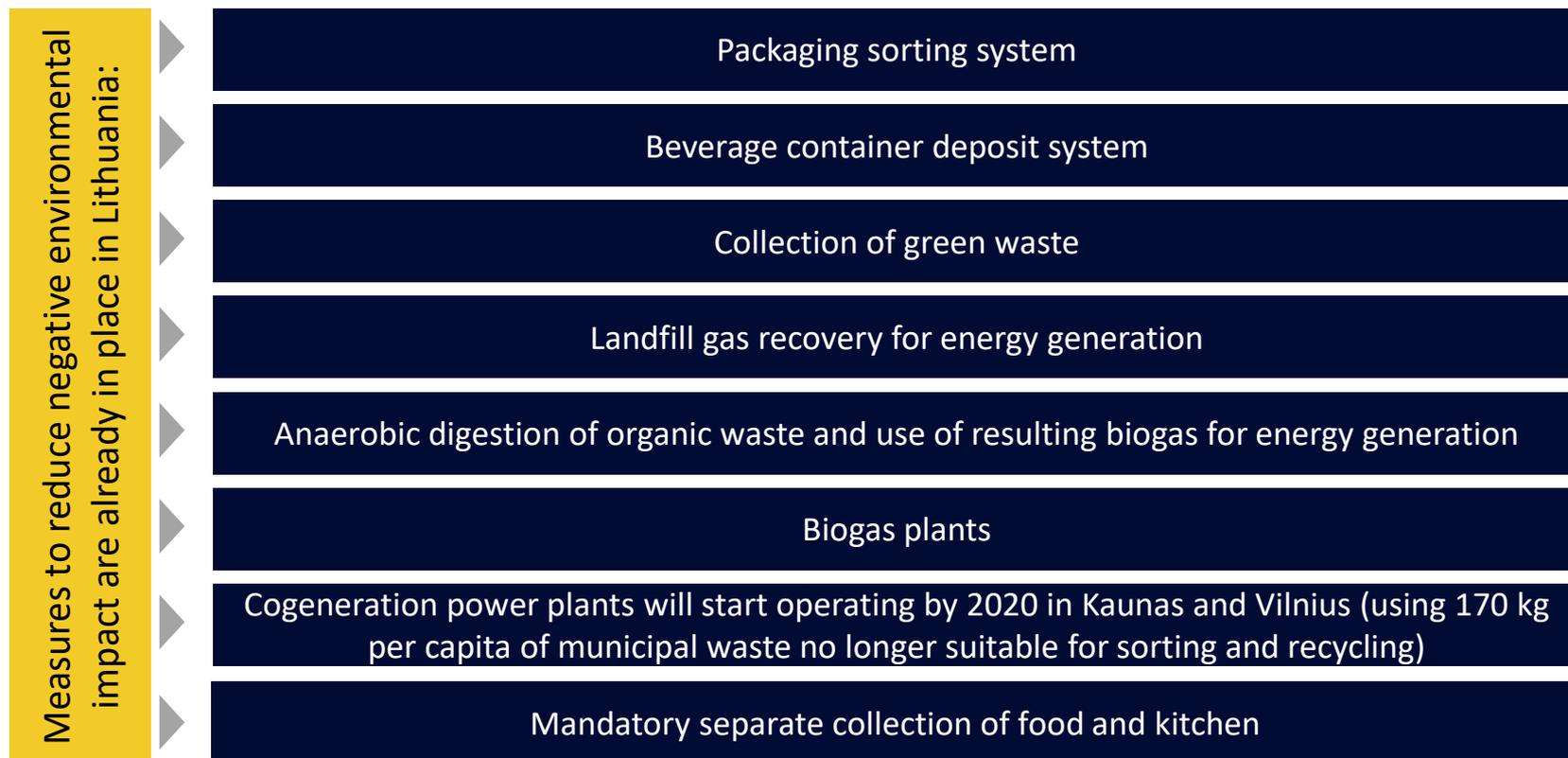
The aim is to encourage polluters to reduce pollution, to prevent and manage waste, to comply with emission standards and to use the tax revenue to implement environmental measures.

State Waste Management plan for 2014-2020

Defines strategic waste management targets, objectives and measures for 2020 , with particular emphasis on waste reuse, landfill reduction.



Measures are being implemented in Lithuania to increase the share of separately collected, recycled and reused waste in the country

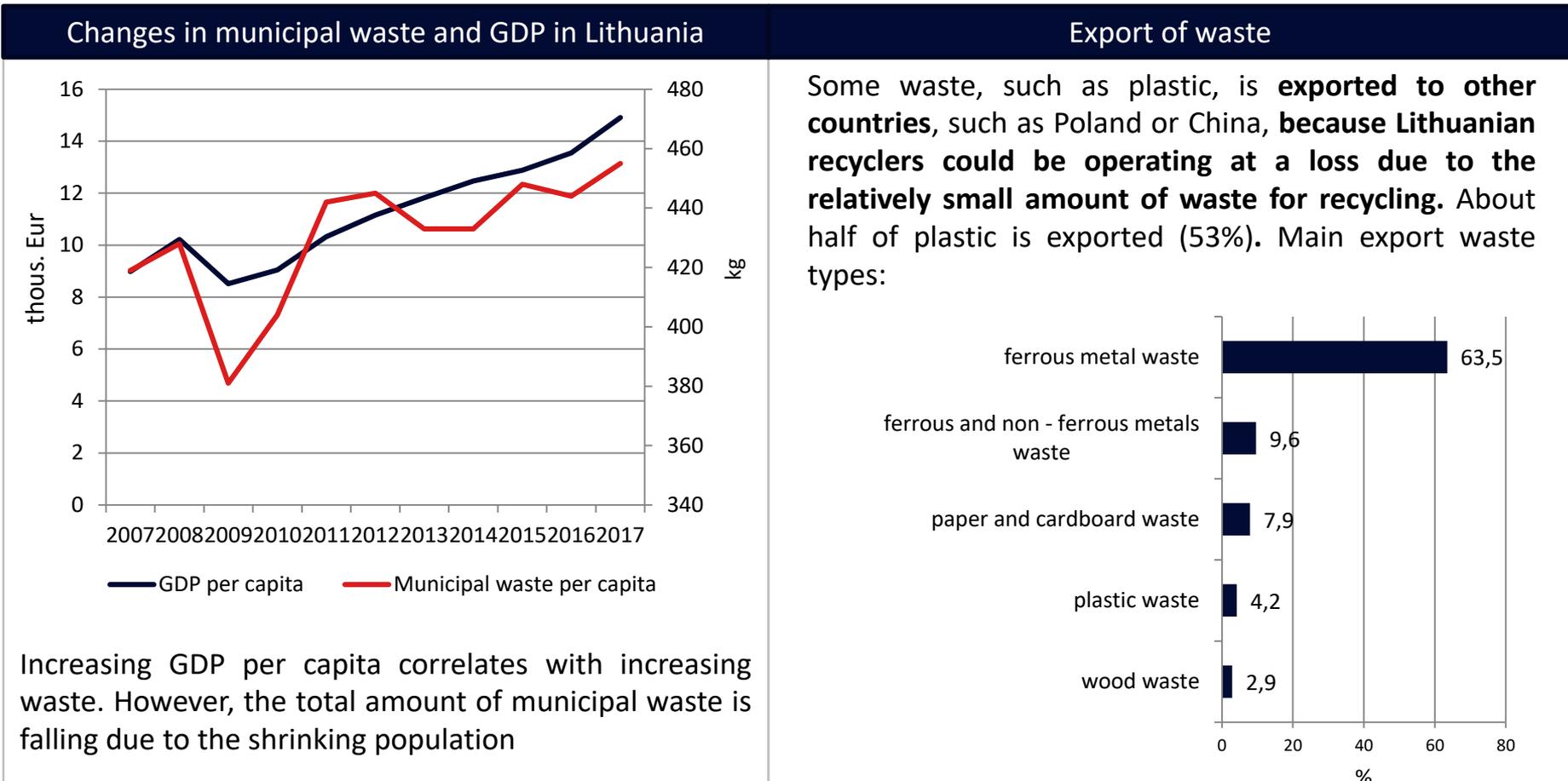


There is still some potential to implement more measures for management of hazardous waste, especially as car oils, and bulky waste.

Contents

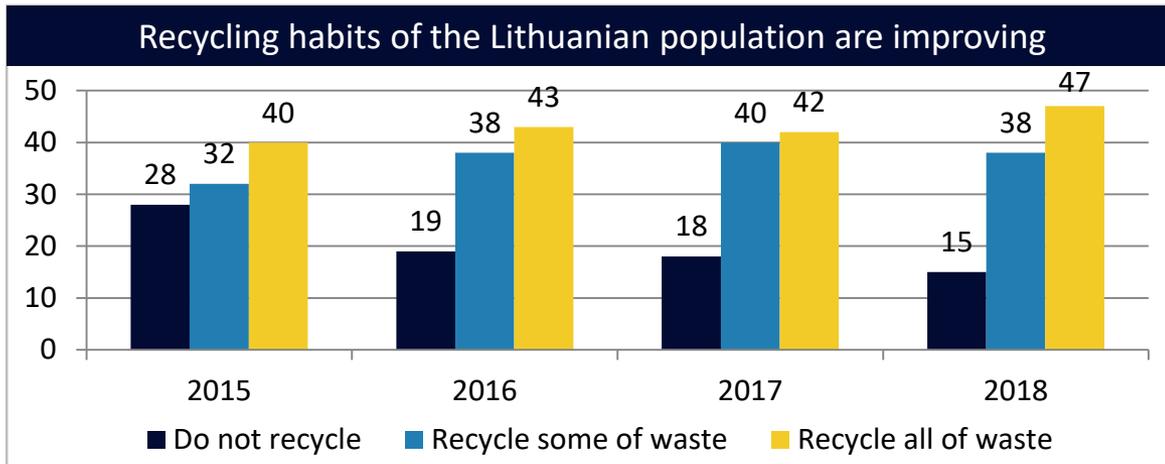
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2. PESL and SWOT analysis
3. Analysis of the situation in Klaipėda region and Šilutė district municipality
4. Potential models of industrial symbiosis

As the economy grows, population consumption increases, leading to higher per capita waste generation. Some of the recyclable waste is exported.

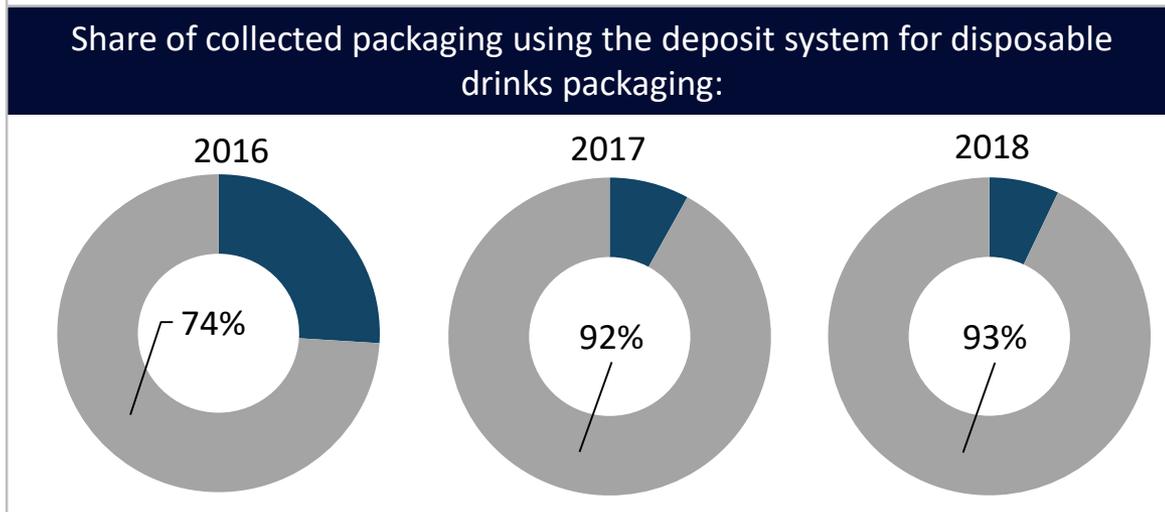


Source: Eurostat, Statistics Lithuania

Social environment in Lithuania is very favourable to landfilled waste reduction and environmental initiatives – people are environmentally conscious, care about the environment



In the last 4 years the number of consumers engaged in recycling has increased by 7%. This can be explained by high ecological awareness: 9 out of 10 residents in 2018 stated that environmental protection is important to them.



The reverse vending machine system revealed that people in Lithuania tend to recycle waste and people are mostly influenced by environmental concerns. Cash rewards are of secondary importance.

Source: Gražinti verta, Ministry of Environment of the Republic of Lithuania

Lithuania's political / legal / social environment is favorable to the implementation of the principles of the circular economy

Political factors

- public waste management policies are based on the principles of the circular economy;
- Lithuanian waste policy is based on the targets set by the EU.

Social factors

- Lithuanians are socially responsible, increasingly inclined to sort waste;
- public is motivated by environmental awareness rather than financial benefits;
- the shrinking population leads to an overall decline in municipal waste.

Economic factors

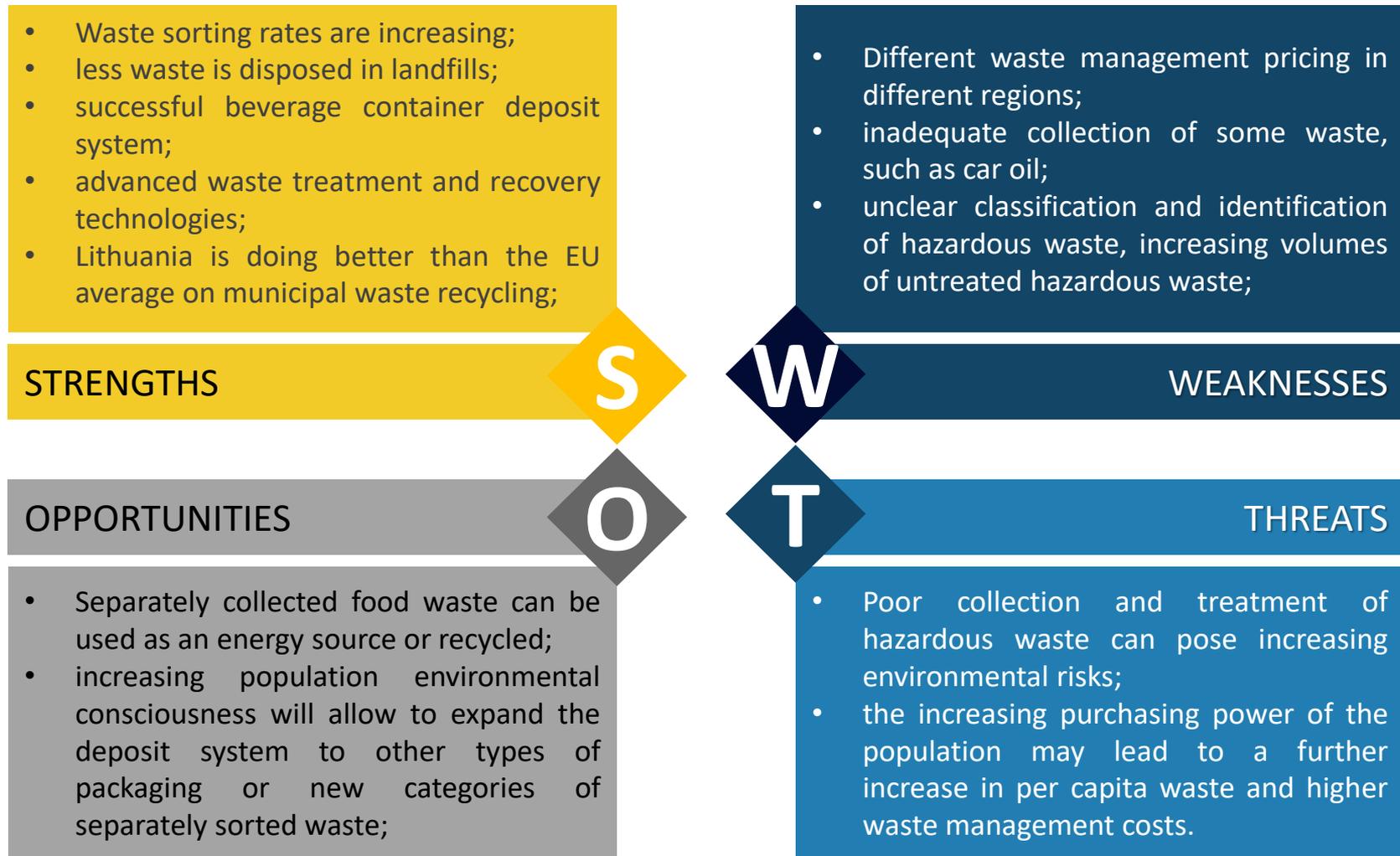
- as the economic situation improves, the amount of waste per capita is also increasing;
- recycling some types of waste is potentially unprofitable for Lithuanian recyclers, therefore some of the waste is exported.

Legal factors

- producers and polluters bear responsibility for waste management;
- the 'polluter pays' principle, collection of tax revenue for environmental projects;
- restrictions on landfilling, strictly regulated separation and recycling of biodegradable waste, collection and disposal of hazardous waste, etc.



Lithuania's waste management system is advanced, measures are implemented to reduce landfilling, but management of some types of waste still causes problems

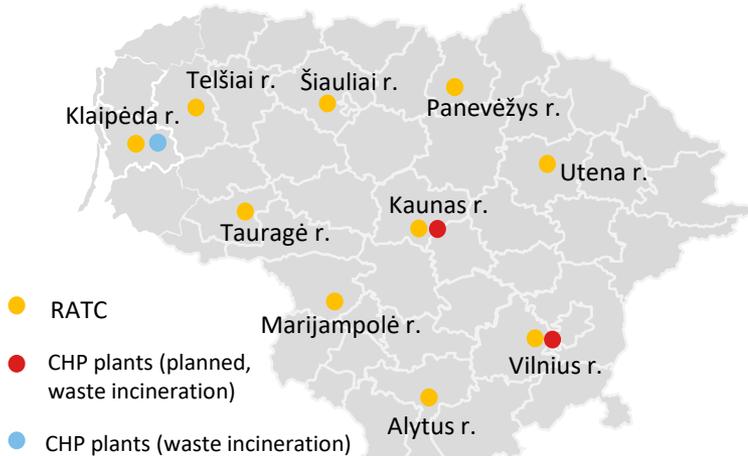


Contents

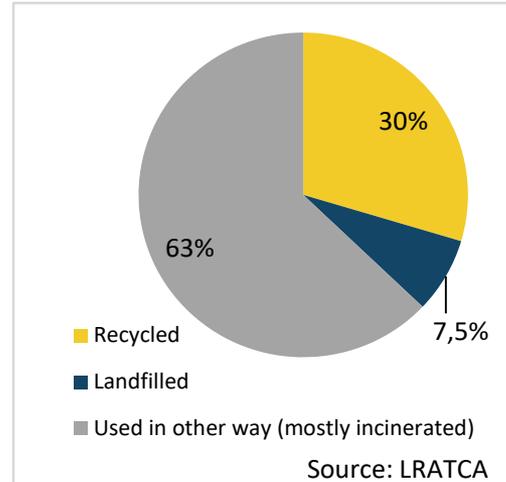
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2. PESL and SWOT analysis
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Due to different economic activities of the industrial companies in Šilutė, symbiosis of waste recovery poses a challenge

Lithuanian waste management system map



Waste management in Klaipėda region



- Lithuania has 10 regional waste management centers (RATCs);
- Klaipėda region landfills only 7,5% of waste – it is the best result in Lithuania;
- 30% of waste in Klaipėda region is recycled and 63% is incinerated in "Fortum Klaipėda" cogeneration plant, which produces heat and electricity for Klaipėda city;

Population of Šilutė District Municipality in July 2019: **37,891**;
Klaipėda region population – **318,664**



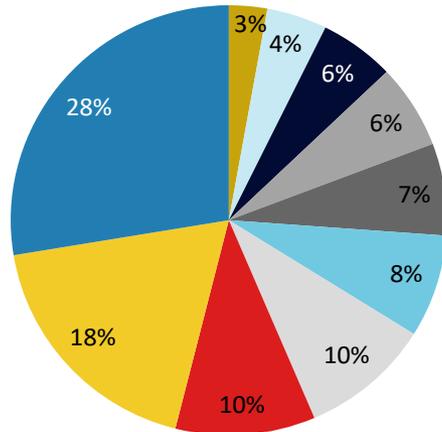
The main companies of Šilutė

Furniture production		AB Šilutės baldai – 775 employees UAB Germanika – 580 employees
Dairy processing and cheese making		ABF Rambynas – 192 employees
Peat extraction		UAB Klasmann – Deilmann – 177 employees
Retail		UAB Šilutės prekyba – 120 employees
Construction		UAB KAVESTA – 158 employees UAB Stamela – 115 employees

There is no industrial park in Šilutė, which would usually serve as a basis for industrial symbiosis practices, and the wide variety of industrial activities makes it difficult to reconcile the needs of different companies and to succeed in symbiosis.

In 2018, 96.5 thous. tons of MSW and 131,9 thous. tonnes non-MSW was handed over to KRATC. 74 thous. tons of waste is bottom ash, slag and boiler dust which is still not being used

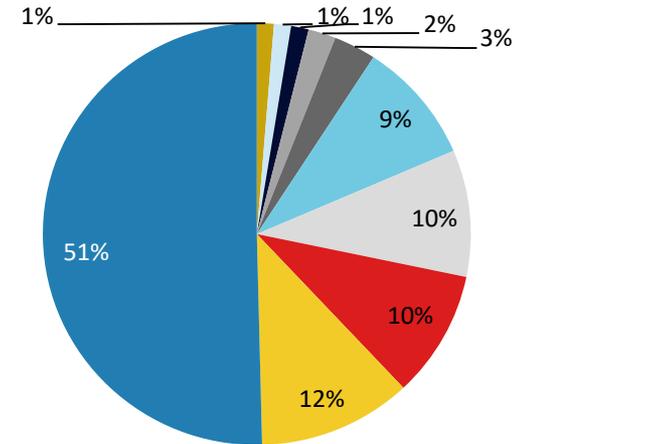
Structure of MSW of Klaipėda region managed in KRATC in 2018



- Metal waste (including packaging)
- Textile waste
- Other non hazardous waste
- Biodegradable food and kitchen waste
- Plastic waste (including packaging)
- Green waste
- Glass waste (including packaging)
- Other municipal waste (hygien waste, shoes...)
- Paper and board waste (including packaging)
- Inert waste (ceramics, concrete...)

- Most of the MSW was **inert waste** (concrete, ceramics, stones...) (28%) and **plastic waste** (18.3%);
- almost a third (29%) of MSW waste is **biodegradable** (green waste, biodegradable food and kitchen waste, etc.)

Structure of non-MSW of Klaipėda region managed in KRATC in 2018



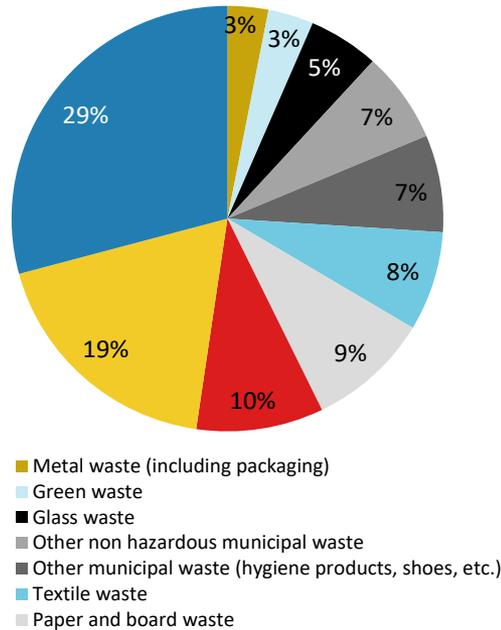
- Street cleaning waste
- Minerals (sand, stone...)
- Wastes not otherwise specified
- Bulky waste
- Mixed construction and demolition waste
- Fly ash from peat and untreated wood
- Other non-biodegradable wastes
- Combustible waste (refuse derived fuel)
- Other mechanical processing waste (
- Bottom ash, slag and boiler dust

- The **bottom ash and slag** occupy the largest part of waste (51%) This type of waste can be used for road construction or as building material, but the applicability of it is still being explored.
- **mixed construction and demolition waste** makes up 12%, **other mechanical processing waste** – 10%, **bulky waste** (furniture, household...) – 10%.

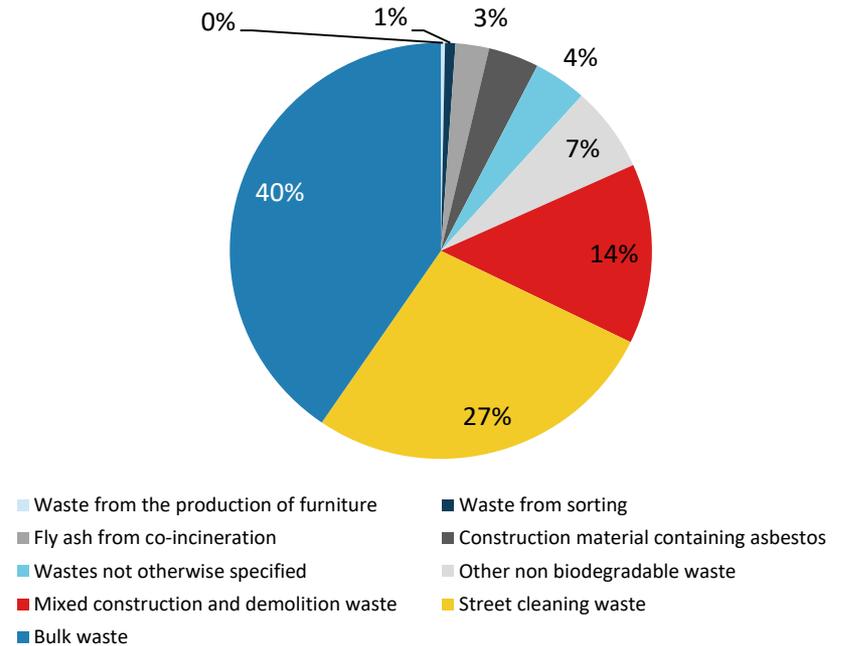
Source: Data provided by KRATC, Studies on MSW composition provided by EPA

In 2018 KRATC received 11,5 thous. tonnes of MSW and 2,6 thous. tonnes of non-MSW waste from Šilutė. Most of MSW is recyclable or can be reused

Structure of MSW of Šilutė managed in KRATC in 2018



Structure of non-MSW of Šilutė managed in KRATC in 2018



- Most of the MSW was **inert waste** (concrete, ceramics, stones...) (28.8%) and **plastic waste** (18.3%);
- **biodegradable waste makes up 29.3 percent** of MSW (green waste, biodegradable food and kitchen waste, etc.)

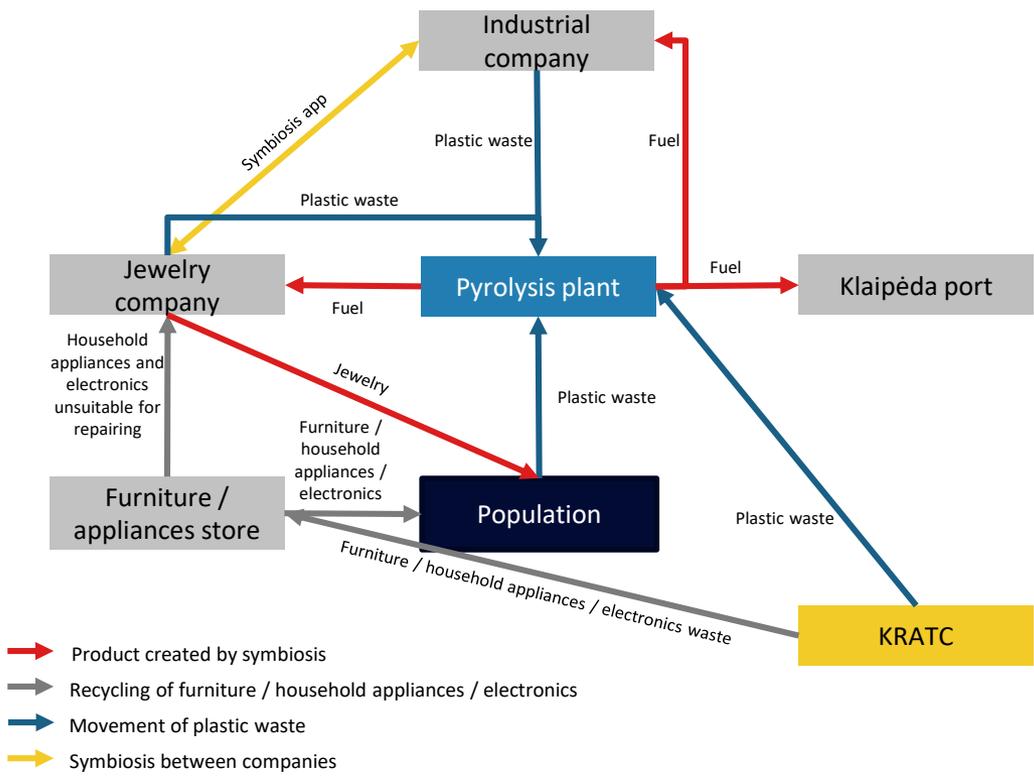
In 2018 the largest part (40%) of non-MSW waste from Šilutė was **bulky waste** (furniture, household appliances, doors, etc.). 27% of waste was **street cleaning waste** and 14 % was mixed **construction and demolition waste**.

Source: Data provided by KRATC, Studies on MSW composition provided by EPA

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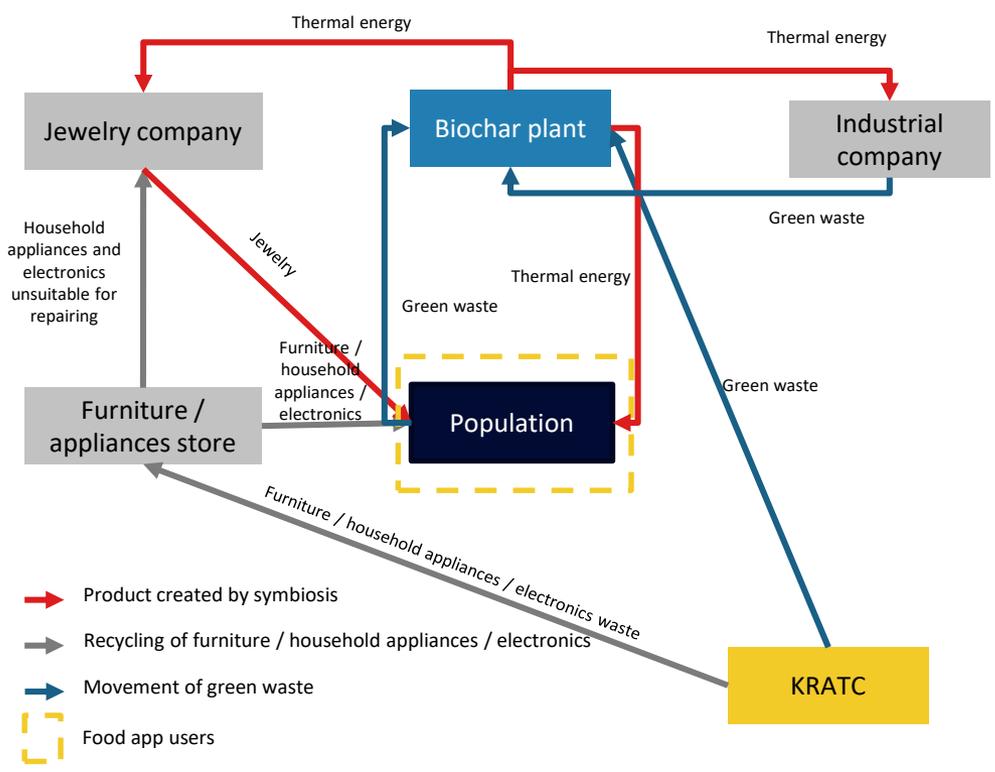
Model 1: Symbiosis using plastic and bulky waste



Beneficiaries	Industrial companies, port; population; socially excluded citizens; KRATC.
Benefits	Industrial fuels, less bulky waste, less plastic waste, developing social responsible business
Risks	Without PVC plastic separation, poor quality fuels can be produced; additional costs every 8 years for upgrading the pyrolysis plant.



Model 2: Symbiosis using green and bulky waste



Beneficiaries	Industrial companies; municipalities; population; socially excluded population; KRATC; food trading companies.
Benefits	Thermal energy; less disposal of green, food, bulk waste; developing socially responsible business; free compost for residents and the municipality
Risks	Potential lack of green waste during the winter season



Biochar plant
 Biochar plant converts green waste into biochar, that can be used as fertilizer and heat power.
The plant operates in:
 Sweden (100+ cities worldwide are planning to implement it)



Used furniture shop
 In the shop for used furniture and household appliances, most of the waste is repaired and brought back to life.
The shop concept operates in:
 Norway



Jewelry from appliances
 Precious metals from non-repairable household appliances and electronics, are recycled and used in jewelry stores to create jewelry
The jewelry stores operate globally.

Industrial symbiosis in Klaipeda region can be carried out based on two models, which use different waste categories, but both solve the problem of bulk waste management and promote social responsibility

Model 1: Symbiosis using plastic and bulk waste

50 – 100 thous. Eur + transportation costs + the cost of establishing and maintaining a furniture / household appliance store (about 100 thous. Eur each year)



Cost

100 – 150 thous. Eur + transportation costs + the cost of establishing and maintaining a furniture / household appliance store (about 100 thous. Eur each year)

- Industrial companies, port;
- population;
- socially excluded population;
- KRATC.



Beneficiaries

- Industrial companies;
- municipalities;
- population;
- socially excluded population;
- KRATC;
- food trading companies.

- Industrial fuels;
- less disposal of plastic and bulk waste;
- symbiosis with Klaipėda port



Benefits

- Thermal energy;
- less disposal of green, food, bulk waste;
- developing socially responsible business;
- free compost for residents and the municipality.

- If PVC plastic is not separated, poor quality fuels can be produced;
- additional costs every 8 years for upgrading the pyrolysis plant.



Risks

- Potential lack of green waste during the winter season.

Model 2: Symbiosis using green and bulk waste

Symbiosis using plastic waste works best with the containers that were installed in Šilutė district

Model 1: Symbiosis using plastic and bulky waste works best for Šilutė district in compliance with the pilot investments that were made.

Model advantages

Possibility to use plastic waste collected by the new semi – underground containers for fuel production

It pushes Šilutė district closer to fulfilling circular economy targets by managing recyclable waste and separately collecting municipal waste

The bulky waste is managed by reusing and repairing furniture and household appliances and selling them in a second-hand shop

Household appliances, that cannot be repaired, have the potential to be used for jewelry making by recycling the appliances and extracting precious metals



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