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## WASTE MANAGEMENT IN SLOVENIA

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### Abstract

The aim of this paper is to give a brief insight on waste management today and tomorrow - focusing on applications, advantages and disadvantages, the progress and the sustainable future. Now more than ever the global community faces choices that can either lead us toward or away from a more peaceful and prosperous future. And the national waste management is one of the crucial areas where we can all contribute to come to the desired goal. On the basis of qualitative research which was done in the period 2018 - 2020 we give a critical view on different aspects of the waste management in Slovenia.

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### Key Words

Waste Management; Sustainability; Slovenia.

## INTRODUCTION

Among the sustainability challenges waste management is probably the most visible and therefore the easiest recognized component. Waste disposal or so called waste management includes all the activities which are required to manage waste from its beginning to its end: collection, transport, treatment and disposal of waste. This also includes monitoring and regulation of the process.

Waste management deals with all kind of waste: solid, liquid, or gaseous; industrial, biological and household. Since waste can be a serious direct or indirect (through consumption of water or food) threat to human health and environment, waste management should reduce all these effects. Let us point out that in compliance with standard ISO14001, the goal of which is to improve environmental footprint, companies eliminate their waste through recovery practices such as recycling materials (glass or paper, for example).

Let us also mention different methods how to handle with all kind of waste to achieve our main goal – to minimize all negative effects to our environment:

- Landfill: disposal of waste by burial.
- Incineration: conversion of solid organic wastes into residue and gaseous products.
- Recycling: reuse of waste.
- Biological reprocessing: composting and digestion processes of organic waste.
- Energy recovery: conversion of non-recyclable waste into fuel, electricity, heat.
- Pyrolysis: conversion of industrial residues into a recovered fuel.
- Resource recovery: diversion of waste for a specific next use.

Successful waste management has a good influence on all three dimensions of sustainability.

- Environment: Minimizing negative effects of waste, helping in the process of greenhouse gas emissions, etc.
- Economy: Creating markets for different methods of waste management, production and consumption of products from “nature-friendly” materials, new jobs and entrepreneurial opportunities.
- Society: Minimizing negative effects of waste on health, new source of employment, helping in the cases of poverty, more inclusive society, etc.

On the other hand, we have to point out that proper waste management is expensive. In most developed countries, handling with waste takes about 20% to 50% of municipal budget (from national or local tax). And what is more worrying, the cheapest options dealing with waste (such as landfill) are the worst options for the environment.

However, having all the technology and knowledge needed to address the pertinent issues, we are still far from acting accordingly and a satisfactory level of achieving responsible conduct in the business and private

environments. Waste management is still a big challenge for many countries. Even more, successful waste management is expensive – it usually takes between 20% and 50% of municipal budget. It requires huge integrated sustainable and socially supported systems.

In our highly urbanised and overcrowded planet we simply cannot afford gradual and slow adjustments, we need to recognize the urgency of the situation and align our life styles and business models to the requirements for keeping our planet less polluted, healthier and safer.

## **WASTE MANAGEMENT IN SLOVENIA**

Indeed, waste management is not uniform among countries. Here are big differences between developed and developing nations; urban and rural areas; residential and industrial parts. In Taipei, for example, households and industries are charged by the city government as much waste as they produce – this successfully increased the amount of recycling waste. In San Francisco, the council banned Styrofoam and plastic bags, put charges on paper bags and increased garbage collection rates. But the goal of all systems stays the same: to build sustainable society, environment and business.

In Europe, Waste Framework Directive follows the hierarchy: prevention (preferred option), preparation for reuse, recycling, recovery and disposal (landfilling and incineration as the last option). According to the Environmental Action Programme, the goal of waste policy in Europe is: to reduce the amount of waste generated; to maximize recycling and re-use; to limit incineration to non-recyclable materials; to phase out landfilling to non-recyclable and non-recoverable waste; to ensure full implementation of the waste policy targets in all member states. One of the targets is “the preparing for re-use and the recycling of municipal waste shall be increased to a minimum of 55%, 60% and 65% by weight by 2025, 2030 and 2035 respectively” (EU Commission, 2019).

As the member of European Union, Slovenia has to follow the rules of the EU Waste Management Policy which was not the case 30 years ago, when 90% of all collected waste in Slovenia was putted in landfills. The biggest and the hardest change was in the approach of dealing with waste and people’s mindsets.

According to the data from the Statistical Office of the Republic of Slovenia, almost 3,6 million tons of waste was recycled in 2018 in Slovenia, which is 38% of all waste generated in or imported into Slovenia. Moreover, in the same year, 4.1 million tons of waste was recovered, which is 43% of all waste; 207.000 tons of waste was utilized for energy, which is more than 2% of all waste in 2018 in Slovenia and 39.000 tons of waste was removed, which is less than 1% of all waste generated in or imported into Slovenia in 2018. You can see the latest data in the following table.

**Table 1:** Generated Waste in Slovenia in 2019

Generated municipal waste	1.064.321 t
Generated municipal waste per capita	509 kg
Generated hazardous municipal waste	7.748 t
Generated hazardous municipal waste per capita	3,7 kg
Share of separately collected municipal waste	72,8 %
Landfilled municipal waste per capita	32 kg

Source: Statistical Office of the Republic of Slovenia (<https://www.stat.si/StatWeb/en/Field/Index/13/70>).

According to the date, we can claim that Slovenia has made crucial progress in waste management in a line with European Union's standards - with the main goal of protecting its environment.

"Slovenia is one of the cleanest and most environment-friendly countries, both in Europe and globally. As of today, it is the only European country with a zero waste capital, whilst 'green' tourism is also on the rise within Slovenia," wrote Rossella Recupero, communications officer at Zero Waste Europe, in a blog where she interviewed Katjo Stres, head of public relations and communications at Ecologists Without Borders, the leading non-governmental organisation in Slovenia dedicated to our environment.

According to Katja Stres, waste care is becoming a Slovenian lifestyle and this is a good basis for the national waste management. Let us just mention that Slovenia has a zero waste capital, annual zero waste events (for example, 300.000 people gather in one day to clean Slovenia), zero waste hotels and shops, people leaving in Slovenia are nature lovers and eager to even improve. Moreover, the Zero Waste Movement in Slovenia managed to prevent 15 thousand tons of mixed waste (Recupero, 2020).

Here, we should point out that Ljubljana – the capital of Slovenia - was the first capital city in Europe that commit to going zero-waste. Twenty years ago, Ljubljana began to separate waste. In 2013 they already had bins for paper and packaging and scheduled collections of bulky waste. More than ten years ago, the city recycled less than 30% of its rubbish. Today this number is more than 65%. And people of Slovenia can be proud that Ljubljana is at the top of the recycling board of European capitals. Let us also mention the Regional Centre for Waste Management which was opened in 2015 and uses natural gas to produce heat and electricity. "It processes 95% of residual waste into recyclable materials and solid fuel, and sends less than 5% to landfill. It even turns biowaste into high-quality gardening compost," wrote Luka Dakskobler (2019).

Of course, Slovenia still have many challenges and space to improve on the field of the waste management, in Ljubljana and elsewhere. For example, a disposal of glut of cemetery candles. And, what is even more important, one of the main goals in Slovenia should be to educate and reinforce good practices via different institutions, municipalities and governmental decisions.

## WASTE MANAGEMENT IN SCHOOLS

Education institutions can make a great contribution to building general sustainability awareness, develop practical insights, and motivating young people to behave responsibly. They can achieve this role by respecting sustainability in two senses:

- a) Integrating the concept into their curricula in various subjects, prepare their pupils to become responsible members of the society and responsible in their future professional roles as well as in their private lives.
- b) Functioning of the institutions to be in line with principles of sustainability. The institutions of “knowledge and wisdom” have a natural responsibility in society for “being role models” – with great educational impact, but making also a broader contribution to local society and beyond.

We already introduced several methods of managing waste among which at least the following are proper to deal with waste on the school grounds. All these actions are ways to get rid of school waste and, on the other hand, to teach and acquaint young people with responsible behaviour towards the environment. The first step is to properly separate waste and to avoid sending waste to landfill. At schools we should also think about reusing waste around the school and in the local community (for example, reusing cloths, plastic bags, etc.). The next step is recycling – pupils should be introduced to the possibility of correct recycling of, for example, paper, plastic, glass, etc., and how this is essential for nature conservation and for the future generations. Moreover, separating organic food and compost it on the school gardens if this is possible is also a good practice.

In the last school year, the company ZEOS from Slovenia, conducted free eco workshops for primary schools in which the pupils and teachers were educated about proper waste management with an emphasis on how properly handle old appliances and waste batteries and why this is important (Dolinšek, 2021). Here, we also have to mention Eco-schools programme, which was founded in 1992 because of the need to integrate sustainable content into educational system worldwide. With the support of the European Commission, in 1994 the program was already present in Denmark (where Eco-Schools originated) Germany, United Kingdom, and Greece. It is a unique internationally recognized program of integrated environmental education, designed to promote and increase awareness of sustainable development among children, pupils and students through their education and through active participation in the local community and beyond. It is also the only nationally and internationally recognized program in Slovenian schools and faculties in accordance with the international criteria of the Foundation for Environmental Education (FEE).

Today more than 19 million pupils/students participate in the program in around 59.000 schools in 68 countries (also in US, China, Brazil, Japan) and these two numbers are rapidly growing. In Slovenia, more than 771 schools and faculties follow the program, 100.000 students and 8.600 teachers are involved in the project. And one of the priority areas of the program is, indeed, the area of waste management – teach young people how to simply manage our waste and how to minimize their impact on the environment. Moreover, pupils need to get acquainted with the importance of reducing waste, reusing goods and products and with recycling whenever possible.

Let us point out that, in general, food, paper, packages, some glass, metal, plastics are the main waste that are produced in schools and, by reducing their amount, schools can save money. Schools can also sell waste materials for recycling and get some extra money. Moreover, paper can be reused. In 2020, Slovenian Eco-schools programme carried out project with the title "We give new life to waste." Through the project activities, children and young people learn about the importance of circular economy. In particular, they increase the awareness about the importance of packaging: the composition of different types of packaging and the sources from which packaging is obtained.

Among others, the objectives of the projects were:

- Encourage and raise awareness among children and young people about the separation of different types of waste.
- Introduce and encourage children, young people and their mentors to learn about the composition of different types of packaging, the possibilities of their processing and recycling, and the use of new products from recycled materials.
- Raise awareness of the composition of different types of packaging and (natural) resources from which the package is obtained.
- Search and present examples of good practice in the field of waste separation, recycling and manufacturing, and the use of new products from recycled materials.

## CONCLUSION

Our economic models and life styles have treated waste as an unavoidable by-product of production and consumption - to be disposed of as quickly and as inexpensively as possible. For far too long societies and governments have tolerated such an attitude, and now we have arrived at the stage when this is simply neither possible, nor acceptable any more. We should act much more sustainable and responsible towards coming generations.

Professor dr. Boris Cizelj (Cizelj et al., 2021), chairman of the board of directors of the Knowledge Economy Network wrote: "NGOs should keep alerting the authorities as well as the general public that fundamental change in our attitude towards waste is absolutely necessary. Secondly, there are the international organisations – particularly the entire UN system, including the UNEP who have developed and adopted a whole range of international conventions and action programmes (including the SDS 2030 Strategy), which are addressing the issues energetically and specifically with the intention to produce results. It is now up to the organised civil society, enjoying support from the scientists, who claim that too much time has already been wasted, to push the issue consistently. They have to insist that only a holistic approach, defined targets at the global level, and relentless efforts by all actors of civil society may be productive enough in exerting the pressure upon governments and parliaments. These have to urgently adopt

effective measures in favour of proper waste management practices, as well as to monitor the implementation of the measures at the national, regional and local levels.”

If the entire regulatory system will encourage companies and individuals to behave sustainably, then we will be successful. At the same time everybody should understand the tangible benefits of a cleaner, healthier and safer environment. But for this to be achieved, everybody should be motivated to contribute consistently and according to their capacity.

Lack of funding is often a major obstacle in building the needed infrastructure. Let us point out that some waste management projects' funding conditions could be favourably adjusted since they directly serve the public interest. Unfortunately, this has been done only in some countries.

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