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**Zero (Ø) Waste
Implementation of Waste Management Policy in Serbia:
Practical Lessons from Slovakia**

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EXECUTIVE SUMMARY

Main international and domestic strategic documents highlight the progress in the waste management policy of Serbia as evident, but stress the necessity for future improvement in this area. In a process of designing policy solutions, we should keep in mind that the goal is not to process and store the waste, but to avoid its negative impact on the environment. This is best achieved by preventing the generation of waste. Therefore, the planned measures should be to improve rather than to exacerbate the situation.

If we take into account the trend that is spreading within European countries and their local governments, we can see that the choice between prevention of generation of waste, reuse and recycling on one hand, and the landfilling and incineration of waste on the other is actually unfair. Landfill should be last act in the process of waste management and with that most experts generally agree, and some experts are still debating the thesis that the burning of waste in general should not be viewed as part of waste management. Local authorities in cities around the world and Europe are pledging to do everything possible to avoid landfilling and burning, determined to adopt the zero point of waste (Zero Waste) as a policy for managing waste. Many cities in the world, applying zero waste policy are successfully moving towards goal of recycling more than 50% of its waste.

Although Serbia is certainly still far from these figures, it is necessary to familiarize our communities with the concept of Zero (Ø) Waste because it is a vision that should be followed, and it is in line with sustainable development. Achieving the goal of Ø waste requires a change in attitude towards waste. This Policy brief is based on the Slovak experience, providing the policy recommendations for introduction of Ø waste system in Serbia. It examines possible policy approaches in establishing waste management system on the local level and calls for creation of communication strategy for raising awareness in waste management. It advocates for creation of all precondition to enable ecological activism on the local level and application of contemporary tools in this process (such as Pay as You Throw principle). It finally calls for changing of infrastructure and involvement of citizens as undisputable and inevitable precondition for implementation of the Ø waste policy.

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Ø Waste

Implementation of Waste Management Policy in Serbia: Practical Lessons learned from Slovakia

1. Introduction

1.1. Understanding Ø Waste - Changing Approach towards Waste

Ø Waste – it is about looking at waste as a valuable resource that can be used to create new products, even generate energy. The idea is to use the rubbish we generate more productively so that nothing that can be reused goes to waste. In that light, there is a need for better understanding primarily of a hierarchy in waste management.

Why, instead of longer-term, and environmentally friendly solutions for the environment which we are all part of, always come up short, but less viable solutions? The issue that has been raised here is whether incineration and land filling or a model of minimization and reuse of waste. Zero Waste solution is therefore an option that we suggest.

Waste management in an environmentally responsible manner is based on a hierarchy of measures that are first trying to minimize the amount of waste generated. It seeks towards the maximum use or recycling waste that has emerged. The waste that could not have been stopped of being generated or used at the very end of the process can be treated or disposed, but in the least harmful way to human health and the environment.

In the short term, the simplest is to dispose or incinerate waste if we are talking about organization and technology, but rather to make the system more acceptable to manufacture and separated collection systems. Zero Waste concepts focus on the prevention of waste at the point of its production as well on the modalities of reuse of waste and the least harmful modalities of its treatment. These are much cheaper and in the same time more environmentally friendly ways of waste management that are in full compliance with contemporary European standards and legislative framework. Prevention, reuse, recycling, composting, anaerobic digestion, mechanical biological treatments are much more acceptable from incineration and disposal to landfills.

By waste incineration, the volume of waste is reduced, instead of being put off to the landfill. However, following negative effects of burning / incineration are beyond any dispute:

- Concentrate on the toxicity of residues resulting from incineration,
- A by-product of a wide range of chemicals released into the atmosphere,
- Carcinogenic substances such as dioxins and furans,
- Ash and residues after cleaning the filter after burning is one-third the amount of incinerated waste, and with the plant for thermal waste treatment, it is well to built a site for hazardous (toxic) waste disposal, and
- Burning of materials made from non-renewable sources.

Many European countries are trying to reduce the amount of waste that is deposited, resulting in a need for increasing the share of recycling waste in the total amount of waste generated. The primary goal is to stop the disposal of untreated waste to sanitary landfills for municipal waste, or worse, the unmanaged landfills, especially when it comes to biodegradable waste that is a major cause in the process of decay because of lack of oxygen within the waste. Local and regional authorities should play very important role in this process, providing strategic framework for waste management, namely establishing a clear policy determination towards creating of a system based on a prevention of generation of

waste, reuse of waste and recycling and not on the system, which inevitably leads towards disposal to landfills or incineration.

Involvement of citizens in the whole waste management system is of crucial importance, and thus actually achieves two objectives. The first is that the quantities of waste are minimised, reused and recycled. If this is not possible, the citizens' role is to dispose waste in a friendly way and on the other hand, in the same time to develop and raise awareness of the importance of proper waste management within the process. These are just some of the necessary solutions in this particular area of environmental policy. Ø waste, being the most environmentally accurate approach in waste management, implies that the producer of waste is involved in its care, therefore, the creator of the problems are involved in its solution.

2. Problem description

2.1. Waste Management System in Serbia

High-costs, low levels of service and inadequate care for the environment are consequences of the poor organisation of waste management in Serbia. The existing legislation defines local municipalities as the entities responsible for managing communal waste.

Waste and waste management have been recognised as a major public issue. However, people generally tend to consider waste as somebody else's problem, so solutions are expected from the government, its agencies, local authorities, industry, etc. The need for cooperation in solving the problems of waste disposal is only recognised in moments of crisis and public concern.

The National Waste Management Strategy (NWMS) provides guidance on the implementation of waste legislation. It establishes systems for the management of specific waste streams. However, waste management plans at regional and local levels have to be developed and proved in practice. Action plan for achieving goals promoted in NWMS does not deal exhaustively with activities on minimisation of waste at its source or its reuse, although they are two most favourable concepts within the hierarchy of waste management! Incineration and landfills are integral in some Regional and Local Waste Management Plans, but should not be central part of waste management system in Serbia.

The long-term objective, 2015-2019, of NWMS is to re-use or recycle 25 % of the total volume of packaging material waste – glass, paper, carton, metal and plastic. Waste prevention will start with a public awareness campaign. This is not a good approach! Together with public awareness campaign (which should be organised in systematic way), we need environmentally and economically sustainable system where resources are kept in the production cycle – we need Ø waste!

3. Policy options

This policy brief examines the policy options for establishing of Ø waste concept in Serbia based on the experiences from Slovakia. Following this rationale of the policy brief, the experience in establishing of this system in Slovakia (Palarikovo municipality sample) will be presented as a favourable policy option. Status quo of existing waste management policy framework in Serbia is another policy option to be presented in this brief.

3.1. Ø Waste strategy of Palarikovo municipality in Slovakia

Palarikovo is the first municipality in Slovakia that adopt Ø waste conception and it is being successfully implemented. The municipality is trying to do everything to decrease the amount of waste for disposal. This is the example of organized best practice activity on local level in the field of waste prevention and reusing.

Optimization steps in waste management

The municipality had to start solving the issue of wastes in 1999, when its municipal landfill was closed down thanks to stricter legislation. At that time, the municipality could choose either the possibility of transporting the wastes to another landfill, connected with higher payments both for the transport and for the fees for landfilling, or to start composting and recycling the waste. In addition to that, the new legislation set a number of other obligations of municipalities, which had to be solved, too.

The first step the municipality did was an analysis of the existing situation. It determined composition of municipal waste in the municipality. Approximately 30%, by volume, was represented by biological waste, 25% by PET-bottles, 15% by paper, 5% by glass, and further 5% by other plastics. The municipality also found that, in spite of 17 years of education of the public, the local people practically do not use the local collection point for secondary raw material. Thanks to this analysis, the municipality concluded that preservation of the existing system of deposition of waste to a landfill would be several times more expensive for it than before. Further, it realized that if it wanted people to separate more waste, it would have to create a system of collection showing the maximum possible comfort. However, simultaneously, such a system had to be feasible from an economic point of view.

Implementation of the project started in 2000 through intensive education of the public concerning reduction of biologically decomposable municipal waste - promotion of domestic composting. Regularly, two-times a year, the inhabitants obtain, in their households, leaflets on domestic composting with the possibility to use the municipal composting places. Education of the public is ensured also by means of local media - press, radio. The citizens association (Environmental Association of Palarikovo) produces, free, composting tanks for the interested persons and it supplies them to households together with information leaflets. In order to support composting, the municipality bought also a chipper, and in the time of thinning out of trees, it ensured chipping of branches for the inhabitants.

Since 2002, an integrated system of separated waste collection has been implemented in the municipality. The system started by collection of four basic components - glass, paper, plastic packaging - PET-bottles and multilayer combined materials. At present, about 18 kinds of collected components form part of the system. However, only raw materials marketable based on contracts concluded in advance are separately collected. Until 2004, the municipality introduced gradually separation of paper and cardboard, tetrapak, glass, various types of plastics, metal packaging, textiles, electronic scrap, tires, batteries, cables, high-volume waste, hazardous waste, and small building waste.

PAYT (pays as you throw) principle as an economic stimulation

Economic stimulation of the inhabitants is important. In 2000 to 2003, people paid a lump sum fee 7.4 € for people who do not separate waste, and 4.7 € for people who do separate. Now, when 99 % of inhabitants have participated in the system, the PAYT (pays as you throw) principle has been applied. The waste producers pay only for mixed municipal waste that is disposed of through landfilling. They do not pay for the separated commodities. The fee for removal of one dustbin of a volume of 110 litres is 1.08 €.

The municipality uses a sack system for collection of the separated materials. At present, the wastes are collected once in two months. Simultaneously with the sacks, electrical waste and

high-volume waste is collected. The municipality gets the sacks at a low price (in the beginning, it got the sacks free, now it pays 0.025 € per one sack), and it started the whole system with minimum investments. The separated raw materials from the sacks are clean and may be more easily processed. The system is beneficial also for the inhabitants who do not have to carry the wastes anywhere. In the time of collection, they put the sacks in front of their house.

Second Hand free or a Green line

A collection yard, where people can bring separated components of municipal waste, according to their needs, is under operation in the municipality. After the reconstruction of the collection yard is finished, a room of still functional things which people will be allowed to take free - small devices, white goods, furniture, etc. - will be present in its premises. In addition to that, the municipality introduced a green line for the inhabitants. Its services reside in that if somebody wants to get rid of something what somebody else could still use, the municipality mediates this offer to the other people. Through this, it meets the principle that the best way is to prevent waste production.

Thanks to the fact that 28 additional municipalities from the neighbourhood (50,000 inhabitants) joined Palarikovo, the municipality obtained a contribution for construction of a Regional Collection Yard from the Recycling Fund.

The whole recycling system is beneficial from an economic point of view and profitable for the municipality, which derives the highest income from recycling of PET-bottles. What is important is that the municipality manages the whole system itself. It also continually improves its system. For example, in order to reduce its costs, it began waste separation also in the cemetery.

The municipality was the first municipality in Slovakia, which openly adopted the Ø Waste system. It wants further to reduce its waste production. It carried out a new analysis of composition of the mixed waste and it found that biological waste forms 68% of its amount. Thus, it wants to start activities promoting composting again. One of these activities is mediation of sale of compost to the inhabitants. Thanks to purchase for the whole region, their price can be lowered considerably.

Everybody involved

The local companies became involved in the waste management system, too. The original fears that the system would be a competitor to the company for Secondary Raw Materials proved to be erroneous. This company is engaged in the purchase of metals only. The separation takes place also in the post, elementary school, as well as nursery schools. Children take part in a competition in tetrapak collection.

Waste collection by Local and Delivery Systems

1. *Local system* - The waste is directly taken away from waste producers. The producers place the waste into plastic bags that have been given to them. Oversized waste can be placed outside next to the bags on the day of collection. The exact day of collection is announced by the local public address system and the households can place the separated waste in front of their houses. Based on condition the waste is separated; all of the above-mentioned waste is then taken away. After transport to the waste collection point, the waste is final-sorted, processed according to the requests from the customer and temporary stored. Finally, it is transported to the recycling factory. Separated waste is being collected from the producers once per month.

2. *Delivery system* - This system is characterized by that the waste is delivered to the collection point directly by individual waste producers at their own expenses. The municipality has established the collection point. There, some types of waste can be handed over free of charge. Waste producers use this in alternative cases; they were not at home on the collection day or in case, or they have produced suddenly more waste than usual. This delivery system is used in case of biodegradable waste as well. This kind of waste can be delivered to the municipal composting plant located in the premises of local agricultural cooperative.

Disposal of biodegradable municipal waste

Biodegradable municipal waste is separated at the place of origin - directly in households, where home composting is established. For this purpose, the municipality runs information campaign aimed to increasing the rate of home and community composting. The aim is to maximize the rate of self-composting households. Part of the campaign also included manufacture of wooden composting containers, leaflets, visiting the individual households, organization of lectures, etc. Municipality also offers a biodegradable waste shredder. For large amounts of biodegradable waste, the municipality offers assistance with the disposal. For multi dwelling units, the municipality provided communal composting containers made of wood or plastic. In case the capacity is insufficient and the containers are filled up, the waste is taken to the municipal composting plant.

Local charge for communal waste and small construction waste

For support of separated waste and home composting Palarikovo in 2005 had put in practice quantity collection of mixed MSW from all of waste producers. This charge is considered as more fair and it has shown that it is sufficiently incentive for waste producers to separate and compost their waste.

People in municipality are not charged for separated waste. They are charged only for amount of produced mixed waste, which has to be transported to the landfill. The tariff for one 110 litre waste bin used for collection of mixed municipal waste is 1,50 €. Tokens can be purchased continuously during working day at the cash desk of municipal office. If payer does not use all the tokens in given year, it can be used it in the following year.

There is also a rule, that if it is found out, that the payer do not implement quantity collection during the first quarter of the year, the municipality has the right to lay capitation fee. Waste is taken to the municipal composting plant.

The new policy in the implementation of the hierarchy of waste management!

The steps shown in this Policy Brief are proven to work in Palarikovo in Slovakia as well as in some other European countries and can be implemented with existing technology. Therefore, prevention of waste and recycling should not be accepted as an addition to the current system of waste collection and disposal. Experiences from Western Europe have shown that the strategy of prevention of waste in Serbia can only be successful if we accept an integral system of waste management accompanied by a great effort to involve the public, which will represent a new and comprehensive system. That this is true tells the fact that we have to become aware, and that is a key component in any waste management program. Public awareness and public participation, in addition to appropriate legislation, strong technical support and adequate funding are the pillars of proper waste management. So it is necessary to strengthen the human resources policy and raising public awareness with a heavy emphasis on the need to carry out these activities in parallel. It is requirement to educate all relevant actors at the same time. That would not happen to ignorance only one of the relevant factors in the enforcement of waste management is hampering the work of

others in the same process. This is a necessary solution in this particular area of environmental policy.

Public participation - the key to success!

Communal waste management depends on the attitude and actions of the public. Public involvement, in as much possible earlier phase, in participation will be effectively in the prevention of waste and recycling. It is wrong assumption that the entire public is unqualified, given that the public every day experience is very important for the development of waste management system that can be functional. The public should be involved in all stages of development strategies, from planning sites for the construction to development of methods of collecting waste. It is necessary to maintain complete transparency in all negotiations and contracts with the private sector and enable public access to a specific time in which citizens can make comments and suggestions to any contract. Only by involving the public in all steps of the process, we can achieve a healthy atmosphere of cooperation between public and state sectors that are necessary for the proper functioning of the whole system.

3.2. Status quo in Serbia waste management policy

The challenge of developing sustainable waste management policy in Serbia represents a growing concern for the national government, local authorities, environmentalists, environmentally orientated CSOs, researchers and the communities at large. Numerous analyses show that one of the biggest ecological problems in Republic of Serbia is an inadequate waste management policy. Good management approach represents one of the main challenges for the local communities in establishing a sustainable system for all waste streams on the local level.

According to the projections made in strategic documents of Serbia, the quantities of waste will increase in future period. The current level of prevention, recycling and waste utilization of waste is insufficient. Although primary recycling in Serbia is regulated by law and provides for separation of paper, glass and metal in specially marked containers, recycling is not functioning in practice.

The existing legislation in Serbia defines local municipalities as the entities responsible for managing most of the waste streams. In this process they face some serious obstacles. Systematically organised collection of household waste covers 60% of population. Rural areas are still inadequately included in this process in Serbia; waste disposal to landfill is the most preferable option in hierarchy of waste management. Waste is being disposed on landfills – most of them do not meet all the technical requirements for operation. Furthermore, 4 481 illegal dumping sites still exist in Serbia. There is no organized system of separate collection, sorting and recycling of waste. These striking facts clearly indicate that policy framework for reuse and prevention of generation of waste still needs to be established. Local communities in Serbia need to decouple use of natural resources and generation of waste from the rate of economic growth by introducing more sustainable production and consumption patterns. This process starts from us as individuals, from our homes, offices etc.

The National Waste Management Strategy provides guidance on the implementation of waste legislation. It establishes systems for the management of specific waste streams. Action plan for achieving goals promoted in Waste Management Strategy does not deal exhaustively with activities on minimisation of waste at its source or its reuse, although these are two most favourable concepts within the hierarchy of waste management! Disposal to landfills is still integral part of Regional and Local Waste Management Plans, but should not be central part of waste management system in Serbia. In this process it is necessary,

particularly at the local level, to develop applicable Local Waste Management Plans, based on real needs, involving all stakeholders in its development and implementation.

Public awareness of citizens about the need for rational and efficient waste management, as well as encouraging of the population for more responsible attitude towards waste and waste management in a sustainable manner still needs to be developed. The effective system for raising awareness on responsible management of waste (focusing on prevention of generation and reuse of waste) is of crucial importance in Serbia, but still does not exist in Serbia.

4. Conclusions and recommendations

Generation of waste should be prevented and its recycling and recovery encouraged so that harmful environmental impacts can be reduced. The shift must be made – from waste producing society toward waste preventing and recycling society. The first is that the waste is less generated, maximally reused (thus, less pressuring the economic growth of local communities) and on the other hand, it minimises the negative impact on environment and health of population.

The steps shown in this Policy Paper Brief are proven to work in Palarikovo in Slovakia as well as in some other European countries and can be implemented with existing technology. Therefore, prevention of waste and recycling should not be accepted as an addition to the current system of waste collection and disposal. Experiences from Western Europe have shown that the strategy of prevention of waste in Serbia can only be successful if we accept an integral system of waste management accompanied by a great effort to involve the public, which will represent a new and comprehensive system. The fact is that we have to become ecologically aware and active, and that is a key component in any waste management program - public awareness and public participation, in addition to appropriate legislation, strong technical support and adequate funding. So it is necessary to strengthen the human resources policy and raising public awareness with a heavy emphasis on the need to carry out these activities in parallel. It is requirement to educate all relevant actors at the same time. This is a necessary solution in this particular area of environmental policy.

4.1. Pursuing Ø Waste Policy in Serbia – Starting from Scratch (Policy Recommendations for Serbia)

How to achieve the goal of adopting Ø Waste as a policy option for future action in Serbia? How to achieve the goal of adopting a Zero Waste in our communities? Ø Waste programs are the fastest and most cost effective ways with which local governments can contribute to avoiding toxics releases from waste disposal practices. In addition - fight climate change, create green jobs and promote local sustainability.

On the basis of the description of the problem and presentation of the existing policy options here follows the list of policy recommendations regarding the implementation of Ø Waste in Serbia:

Examining possible policy approaches in establishing waste management system on the local level - Local municipalities in Serbia, within the process of analysis of particular waste streams should make cost & benefit analysis whether the management of different waste streams should predominantly depend on the disposal on the landfills as proposed by NWMS, or the funds envisaged for this should be reallocated to initiatives regarding prevention, separate collection and recycling. Landfills are for Serbian municipalities the most expensive and less favourable policy option for treatment of waste, demanding major capital investments, local population is often opposing to their establishment, and management of landfills represent a long term obligation. On the

experience from Palarikovo we can conclude that each local municipality should, according to results of cost & benefit analysis, decides – regular waste streaming based on landfills as rule or Ø waste including landfills as the least favourable option (not only in Ø waste, but as well in hierarchy of waste management itself).

Creation of communication strategy for raising awareness in waste management - According to the Analysis of measures and activities from the NWMS 2003 – 2008, the activities regarding raising awareness on waste management was not implemented! New NWMS is based on public awareness campaigns when it comes to raising awareness in waste management. This approach must be a result of policy on raising awareness on waste issues, based on communication strategy, which does not exist at all levels in Serbia. Public awareness campaigns are desirable policy option, but must not be the only type of raising awareness activity. This communication strategy should promote the concept of Ø waste at national and local level. Local communities and businesses should adopt Ø waste as a goal and plan how to achieve it. The strategy should promote close cooperation between local authorities and the existing recycling industry and reuse business and support Ø waste procurement policies and programs.

Enable ecological activism on the local level - To be ecologically aware, does not necessary imply to be ecologically active! In some of the surveys conducted in Serbia, about 70% of population would do a primary separation of waste if they would have the necessary instruments and conditions. Local municipalities must pursue the goal established by the legal framework, which is to establish functional system for primary separation as well for effective and efficient recycling (proved to be as an effective way to motivate citizens' participation in the process). Ø waste is underpinned by a process of extensive primary selection that leads to more efficient reuse and recycling of waste.

Application of the PAYT principle - PAYT principle should be applied on the local level. By this, the local population is stimulated to conduct primary selection. This policy recommendation, however, implies the carefully designed strategy for fighting illegal waste treatments which could emerge on the local level after the introduction of the PAYT principle (e.g. creation of new illegal dumpsites).

Local collection points - Local municipalities should develop local collection points where citizens and all interested parties can leave and collect second hand material, which is often treated as waste, although it can be reused.

Changing the infrastructure – The waste management infrastructure in Serbia must be designed to phase out waste following the waste hierarchy.

1) *Waste Prevention* – should be implemented in local and regional waste management plans. Prevention targets prove to be necessary to trigger action at national level. Industrial responsibility is a key in creating green jobs and designing waste out of the system:

- By designing long-lasting, easily maintainable and repairable products,
- By reducing packaging and redesigning those products that cannot be safely composted, reused and recycled.

Education and training of professionals, policy makers and citizens is vital to advance in the paradigm shift and in progressively phasing out waste.

2) *Separate Collection* – source separation of at least organics, recyclables, reusable products and components and residual waste should be the minimum separation allowed. Currently examples in Europe show separate collection achieve recycling of 80 to 90% of the municipal waste. Kerbside collection is the most powerful tool to prevent any increase in waste and obtain clean separation of materials at source. Price incentives should be promoted as a key driver of behaviour. Excessive generation of waste should be penalised. Kerbside collection should be complemented with local reuse and recycling centres to let households and businesses deliver recyclables (and hazardous waste).

Disposal infrastructure such as landfills or incinerators should be phased out as recycling rates increase. Flexibility is vital in Ø waste, therefore contracts and waste plans should not inhibit increased recycling.

Engaging the community – Community education and participation is indispensable for the success of any Zero Waste plan. Citizens should be invited to take active participation in the design of the waste management system and to monitor and provide feedback on its implementation. Public education campaigns to encourage public participation should be undertaken, and they need to be sustained over time.

Zero Waste maximizes recycling, minimizes waste, reduces consumption and ensures that products are made to be reused, repaired or recycled back into nature or the marketplace. Zero Waste challenges badly designed waste management systems that "use too many resources to make too few people more productive"; addresses, through job creation and civic participation, increasing wastage of human resources and erosion of democracy, helps communities achieve a local economy that operates efficiently, sustains good jobs, and provides a measure of self-sufficiency, aims to eliminate rather than manage waste. This is way the only way to reduce waste in Serbia in most effective and efficient way in Serbia is Ø waste.

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