

WASTE MANAGEMENT IN POST-SOVIET COUNTRIES: HOW FAR AWAY FROM EU?

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SUMMARY: After the collapse of the Soviet system, every independent successor state selected its own way of development, own goals and speed of transformation. Dramatic changes were linked not only to the political and economic sphere, but also to environmental governance as a whole and waste management in particular. 25 years later the authors looked at post-soviet countries and analysed the situation in the sector of municipal solid waste management by comparing this with EU member states (some of them also have a socialistic past). We used EU-criteria developed for European waste management policy and looked for answers related to the question: how far developed is the current state of waste management in post-soviet countries compared to EU members? Which factors define the potential efficiency of waste management system and its full conformity with the situation in “old” EU member states? Based on the “BiPRO approach” (BiPRO, 2012) we assessed the municipal solid waste system in 6 post-Soviet countries: Belarus, Ukraine, Russia, Kazakhstan, Moldova and Georgia and compared this with scores of selected EU member states. The final scores of 6 post-soviet countries range from 2 (Georgia) to 13 (Belarus) and correspond to EU members of the third group (with the lowest score of the assessment) – Latvia, Cyprus, Romania, Lithuania, Malta and Greece. The common reasons for these low scores in all mentioned countries are weak waste management policies, and landfilling as a main way of waste disposal, the lack of economic instruments for stimulating reducing of waste generation and recycling, as well as underdeveloped infrastructure for waste treatment facilities. Specific problems for post-soviet countries are, for example, the high share of landfilled biodegradable waste, incomplete collection coverage of waste collection systems, the lack of forecasting of waste quantities and planning of waste management, preserved obsolete soviet approach to tariff policy, statistical accounting and administrative procedures in the sector of waste management. Such soviet legacy does not correspond to modern environmental requirements and waste policy. Solid waste management systems in the considered countries have significant shortcomings in terms of legislation and regulation, tariff policy and operating institutions. The improvement of waste management systems should aim at the legislative ban on the disposal of municipal solid waste at landfills, the re-establishment of a separate waste collection system (destroyed after USSR collapse), primarily biodegradable waste, secondary materials, hazardous waste and WEEE, the establishment of economic and financial mechanisms supporting the waste processing sector and stimulating the population to reduce waste generation. The existing strategic documents in the field of waste management in these countries should be analyzed in order to identify governance gaps and policy implementation deficits. The results will be used as a basis

for improving both the environmental policy in the field of waste management and the economic efficiency of the solid waste management...

1. INTRODUCTION

An issue of municipal solid waste management is an urgent problem of urban management and environmental governance in the countries with different level of social and economic development. Constant growth of the consumption is collaborating with the increasing of the waste generation over the world. The strategic goals of the waste management are becoming recycling, minimization and avoiding the waste generation. The main challenge of the environmental governance is the municipal solid waste management (MSWM) linked to the quality of the waste collection, removing and recycling, as well as the efficiency of the institutions for the waste management. The problem of MSWM is a very crucial in the developing and transition economies due to the lack or imperfection of the political, economic and financial instruments of the waste management.

The focus of the paper is the post-socialistic countries. After the collapse of the Soviet system, every independent successor state selected its own way of the development, own goals and speed of the transformation. Dramatic changes were linked not only to the political and economic sphere, but also to the environmental governance as a whole and waste management in particular. 25 years later the authors looked at post-soviet countries and analysed the situation in the sector of municipal solid waste management by comparing this with EU member states (some of them also have a socialistic past). We used EU-criteria developed for European waste management policy and looked for answers related to the question: how far developed is the current state of the waste management in post-soviet countries compared to EU members? Which factors define the potential efficiency of the waste management system and its full conformity with the situation in "old" EU member states?

The MSWM systems in the following post-soviet countries were analysed: Belarus, Ukraine, Russia, Kazakhstan, Moldova and Georgia. The main characteristics of the MSWM system in the mentioned countries are (1) landfilling as a main method of waste management; (2) tariff policy based on the "normative of waste generation" for the waste collection and removing per capita; (3) significant over-use of the equipment; (4) under-development of the recycling capacity; (5) littering of the urban areas; (6) development of the informal and illegal sector of the collection and treatment of the recyclables.

2. METHODS AND MATERIALS

The research is based on the BiPRO approach (BiPRO, 2012) developed under the EU project "Support to Member States in improving waste management based on assessment of Member States' performance". The list of the criteria was developed based on the EU Landfill directive (1999) and Framework on waste management (2008). Criteria were divided on the 5 groups: (1) compliance with the waste management hierarchy reflecting the real situation; (2) existence and application of legal and economic instruments to support waste management according to the waste hierarchy; (3) existence and quality of an adequate network of treatment facilities and future planning for municipal waste management; (4) fulfilment of the targets for diversion of biodegradable municipal waste from landfills and (5) number of infringement procedures and court cases concerning non-compliance with the EU waste legislation.

According to the research goals the fifth group of the criteria was not assessed, and the final scores of the EU countries from (BiPRO, 2012) were re-calculated without the mentioned criteria group. The initial data for the assessment of MSWM system was an available statistic

data, legislative and normative documents, analytical surveys and reviews, reports, published scientific papers. The initial value of every criterion was converted to points (0, 1 or 2) according to established threshold scores (BiPRO, 2012).

3. MUNICIPAL SOLID WASTE SYSTEM IN THE POST-SOVIET COUNTRIES

Results of the assessment of MSWM system in the post-soviet countries are represented in the table below. In all mentioned countries the waste generation is increasing on the background of the growth of the consumption. The waste quantity per capita in all analysed countries is drawing near to EU level (more than 400 kg per capita). In Georgia data on the waste generation and treatment are not collected systematically. The problem of outstripping growth of the waste generation over consumption is typical for EU countries also, including leaders in the treatment of municipal solid waste (MSW). Only in such countries as Austria, the Netherlands, Denmark and Luxembourg the growth of MSW is the only indicator that is equal to zero amid significant progress in all other areas of improving the waste management system.

The common issue for the post-soviet countries is the lack of the accurate estimations of the total waste generation due to a specific of the statistic recording. Statistic recording takes into account only the amount of collected and removed waste by formal system. In some cases data from local level are not transmitted correctly to national level and may contain significant mismatching. This amount is much less than total amount of the waste generation (not all waste is captured by formal system), but there is a lack of official data and assessment of the waste flows in the informal and illegal sector.

Table 1. The results of the assessment of the MSWM system in post-soviet countries

<i>Indicator</i>	<i>Way of calculation</i>	<i>Belarus</i>	<i>Russia</i>	<i>Kazakh- stan</i>	<i>Ukraine</i>	<i>Moldo- va</i>	<i>Georgia</i>
1 Compliance with the waste management hierarchy reflecting the real situation							
Criterion 1.1: Level of decoupling of municipal waste generation from household final consumption expenditure	Reducing of Waste generation – 2, increasing of consumption is slower, than waste generation – 1, waste generation is equal to increasing of consumption– 0	1	0	1	0	0	N/A
Criterion 1.2: Existence of own waste prevention programme (WPP) or equivalent existence in WMP or other (environmental) programmes	Does a waste prevention programme exist? Does an equivalent exist in WMP or other (environmental) programmes? YES: 2 / NO: 0	2	2	0	2	2	2
Criterion 1.3: Amount of municipal waste recycled (material recycling and other forms of recycling including composting)	How much municipal waste is recycled in a particular year (in %)? >39 % :2, 19-39 %: 1, <19 % : 0	1 D	0 D	0 D	0 D	0 D	0 D
Criterion 1.4: Amount of municipal waste	How much municipal waste is recovered (energy recovery) in a	1 D	1 D	0 D	1 D	0 D	0 D

recovered (energy recovery)	particular year (in %)? >17 % :2, 1-16 %: 1, <0 % : 0						
Criterion 1.5: Amount of municipal waste disposed (deposit onto or into land and incinerated without energy recovery)	How much municipal waste was disposed of (deposit onto or into land and incinerated without energy recovery in a particular year in %)? < 49,5 % :2, 49,5-75 %: 1, >75 % : 0	0 D	0 D	0 D	0 D	0 D	0 D
Criterion 1.6: Development of municipal waste recycling (material recycling and other forms of recycling including composting)	What was the development of recycling of municipal waste during the last three years (in %)? Recycling rate increased min. 5 % or total rate is min. 40 % over the last three years: 2 Recycling rate increased over the last three years, but increasing rate is below 5 %: 1 Rate of recycling is decreasing or zero in last three years: 0	2	1	1	1	0	0
2 Existence and application of legal and economic instruments to support waste management according to the waste hierarchy							
Criterion 2.1: Existence of nationwide ban/restrictions for the disposal of municipal waste into landfills	Is a ban / are restrictions for the disposal of municipal waste applied? YES: 2 / Restrictions: 1 / NO: 0	1	1	1	0	0	0
Criterion 2.2: Total typical charge for the disposal of municipal waste in a landfill	How much is charged for landfilling municipal waste (€/t)? < 35: 0, 36-100: 1, > 100: 2	0	0	0	0	0	0
Criterion 2.3: Existence of pay-as-you-throw (PAYT) systems for municipal waste	Is a PAYT system for municipal waste in place? Yes, covering the whole territory: 2 / Yes, not covering all municipalities: 1 / No: 0	0	0	0	0	0	0
3 Existence and quality of an adequate network of treatment facilities and future planning for municipal waste management							
Criterion 3.1: Collection coverage for municipal waste	Does 100 % collection coverage exist? No: 0 / Yes: 2. In case no information is available in the consulted reference document, a score of 0 applies.	0	0	0	0	0	0
Criterion 3.2: Available treatment capacity for municipal waste in	Is information about capacity available? / Does an under capacity exist?	1	0	0	0	0	0

line with the EU waste legislation (including disposal and incineration)	Under capacity: No: 2 / Yes: 0 In case no information is available in the reference documents, a score of 0 applies.						
Criterion 3.3: Forecast of municipal waste generation and treatment capacity in the WMP	Is under capacity to be expected according to information contained in the WMP? No: 2 / Yes: 0 In case no information is available in the WMP, a score of 0 applies.	0	1	1	0	1	0
Criterion 3.4: Existence and quality of projection of municipal waste generation and treatment in the WMP	Is information on the future development of municipal waste generation and treatment in the territory included in the WMP? Yes, in high quality: 2 / Yes: 1 / No: 0	1	1	1	0	1	0
Criterion 3.5: Compliance of existing landfills for non-hazardous waste with the Landfill Directive	Which percentage of landfills for non-hazardous waste is compliant with the requirements of the Landfill Directive (in %)? 100 %: 2 / at least 75 %: 1 / below 75 %: 0	1	0	0	0	0	0
4 Fulfillment of the targets for diversion of biodegradable municipal waste from landfills							
Criterion 4.1: Fulfillment of the targets of the Landfill Directive related to biodegradable municipal waste going to landfills	Is the first target on reducing biodegradable municipal waste disposed of in landfill reduced to at least 75 % fulfilled? Yes: 2 / No: 0	0	0	0	0	0	0
Criterion 4.2: Rate of biodegradable municipal waste going to landfills	Rate of biodegradable municipal waste going to landfills: less 40 % - 2, 40-75 % - 1, more 75 % or the lack of data - 0	0	0	0	0	0	0
Overall score		13	7	5	5	4	2

National programs, normative and regulative documents on MSW management are approved in Belarus (Concept..., 2014), Ukraine, Russia (Integrated strategy..., 2013), Moldova (National waste management strategy..., 2013) and Georgia. The National program of modernization of MSWM system in Kazakhstan (2014) was canceled in the September, 2016. It should be mentioned that approved national strategies on MSW management is one of the advantages of Belarus, Ukraine, Russia, Moldova and Georgia, since more than half of the EU members (17 States) do not have national documents on MSW management and use EU directives. From the other hand, as was pointed in report (BiPRO, 2012), approved national policy and legislative

documents on MSW management do not guarantee an efficiency of MSWM system due to governance gaps and implementation deficits. All of these could be pointed in analysed countries: in spite of approved national strategies on MSW management, the situation with MSW was not radically changed.

Almost all MSW are landfilled in post-soviet countries: more than 90 % in Kazakhstan and Ukraine, about 90 % in Russia and Moldova and about 85 % in Belarus. The level of the recycling in Ukraine, Russia and Kazakhstan is less than 10 %, and in Belarus is about 20 %. In the Republic of Moldova, the data on the volume of recycled waste is not under statistical monitoring. The recycling plant was opened in 2015. The data on the material recycling in Georgia is not available in the open sources. There is few incineration plants in Belarus, Ukraine and Russia built for energy production, but their capacity is not enough to play significant role in the MSW treatment. Kazakhstan is only planning to construct incineration plants.

In all analyzed countries the capacity for the MSW treatment and recycling is underdeveloped and the list of recycling technologies is short. Recycling plants in Russia and Kazakhstan are private, in Belarus they belong to state. Recycling plants in mentioned countries meet the similar problems: (1) the high cost of recycling products with relatively low their quality; (2) the poor quality of the waste for the recycling due to the lack or the ineffective waste sorting; (3) the prevalence of the manual labor with involving marginal groups, (4) the competition with illegal recycling sector. In spite on noted problems, the recycling sector is fast developing in all analyzed countries. Its growth is particularly impressive in Belarus, where for the last five years the capacity of recycling plants has increased by almost 20 %. In Ukraine there is a huge recycling potential, waste treatment is provided both in formal and informal way. There are lots of companies dealing with waste recycling in Ukraine but with no official monitoring, accounting and control. Therefore, it could be observed the lack of the statistical data in open sources. That was the reason of low scoring for Ukraine.

Biodegradable waste is not a point for MSW management in the analyzed countries. The generation, landfilling or treatment of the biodegradable waste is not controlled. Moreover, there is not definition of such kind of the waste in the national legislations. There is the lack of reliable statistical data on the biodegradable waste in the countries, that is why this criteria has score "0" in the final assessment. Almost all biodegradable waste goes to the landfills in all analyzed countries. The share of the biodegradable waste varies from the place of their generation: its share is much larger in the multi-story apartments; and such kind of waste is practically not met in the waste from private households where biodegradable waste is traditionally used for the composting or incineration.

It should be noted that the system of the collection of "*food waste*" was established in the USSR. The "*food waste*" was collected at the multi-story apartments and then transported to the livestock breeding complexes for animal fattening. After the USSR collapse this system was destroyed due to reasons of hygienic and sanitary safety as well as due to changes in animal fattening technologies. The revival of such system for "*food waste*", of course in the modernized form adapted to modern conditions, could be greatly improved the MSWM system and decreased the share of the landfilling the biodegradable waste.

Economic instruments for MSWM regulation are underdeveloped in all overviewed countries. There is no ban for landfilling of MSW (only restrictions for the landfilling of several kind of waste and recyclables), and the fee for the landfilling is very low in the compare with EU countries (significantly less than 35 euro per ton). The current tariff policy does not stimulate to reduce waste generation or organize the waste recycling. Pay-as-you-throw (PAYT) systems for municipal waste are not established in all analyzed countries. The waste separation system at the places of its generation is settled up in Belarus, but its efficiency is very low: the share of separately collected waste is only 4-5 %. In Ukraine the MSW separate collection is implemented in about 400 settlements, but the data on their efficiency is not available.

The tariff policy in all mentioned post-soviet countries saves soviet features; it is based on the “*normative of waste generation per capita*” and established tariffs for communal services. The growth of the service costs is based, as a rule, on the artificial increasing mentioned “*normative per capita*” because the tariffs on communal services are socially sensitive component and their increasing is regulated by the national governments. In other words, the implementation of the PAYT systems is not profitable for service providers under existing tariff policy. Therefore, economic measures on prevention of the waste generation are not implemented in the described countries.

The weak component of the MSWM system in all countries is the forecasting and planning in the waste sector. As was already noted, the capacity of the recycling plants is underdeveloped. At the same time there is no clear strategy for developing of the recycling capacity due to the lack of the reliable assessment of the waste generation of different types as well as the forecasts of economically feasible recycling and extraction of the secondary raw materials. Approved national strategies, programs and plans include, of course, elements of the forecasting and planning, but they are not detailed. In analyzed countries there are no established integrated plans of MSWM at the local level. As a result, it could be stated that the MSWM system in analyzed post-soviet countries is not effective.

There is no 100-% coverage of the waste collection system in all overviewed countries. Many landfills do not meet modern environmental requirements or do not have all necessary documents and permissions. Current regulations for design, construction and functioning landfills as well as their enforcement is significantly differ from EU Landfill Directive. The national requirements are not comparable with EU regulations, that why the final score for this criterion is very low in all analyzed countries.

4. RESULTS AND DISCUSSION

The final assessment of MSWM system in analyzed post-soviet countries is represented in the Fig. 1. The results are corresponding with EU countries of the third group with the lowest score – Latvia, Cyprus, Romania, Lithuania, Malta, Bulgaria and Greece.

The analysis of the weakness of the MSWM systems in the EU countries of the third group highlighted the similar problems as in the analysed post-soviet states. The common features of the MSWM systems are (1) weak policy, especially with respect to the ban of the landfilling and regulation of the biodegradable waste treatment; (2) the lack of the economic instruments for stimulating the reducing the waste generation and recycling; (3) not 100-% coverage by the formal system of the waste collection and removing; (4) governance gaps and implementation deficits of the local waste management plans and programs. Significant disadvantages of the assessed MSWM system in the post-soviet states are the lack of reliable data on the amount and composition of the waste, widespread practice of illegal forms of the waste treatment (dumps, waste burning, etc.). Governmental regulations in the field of the waste management in studied countries is often ineffective due to uncoordinated activities of the state agencies, unclear power distribution among them.

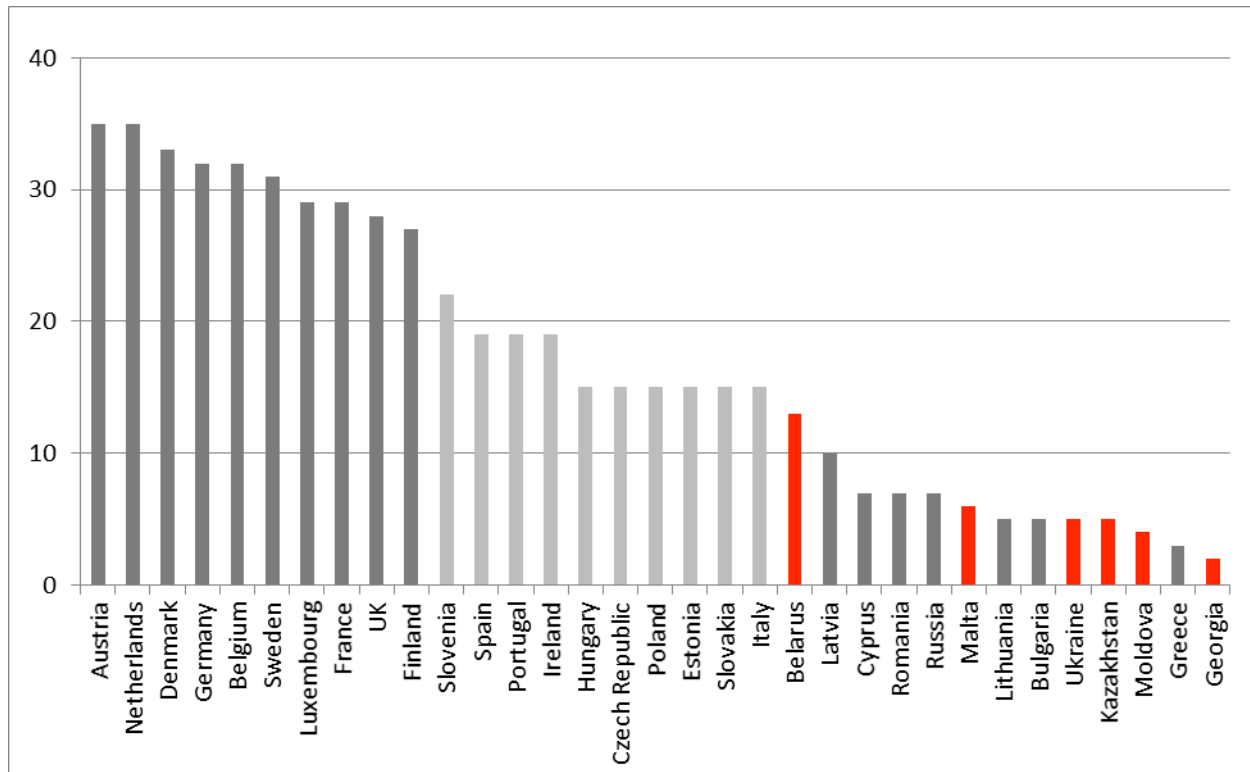


Figure 1. Comparative assessment of the municipal solid waste management system in European countries

The final score for the post-soviet countries could have higher values, if the relevant statistic data will be available in the comparable form. The changes in the statistic accounting and reporting could be looked as a measure of the increasing the efficiency of the MSWM system. During post-soviet period the legislation was changed as well as statistic forms and data. These changes were not always successful. For example, in Russia the term “MSW” was included in the definition of the “consumption waste”. The result is the lack of statistic data or extremely generalized and insufficient information about MSW. It is even more difficult to find and compile information about recyclables because the statistic data is not separated recyclables from consumption waste and recyclables from production waste. In Ukraine there are two different official sources of information about collected, treated and disposed waste amount: State Statistics Service and Ministry of Regional Development, Construction and Housing and Communal Services. State Statistics Service registers household and similar waste (household and similar wastes - wastes produced in the process of people activity in the inhabited and uninhabited buildings (solid, bulky, repair, liquid, except waste associated with the production activities of enterprises) and that are not used in the place of their accumulation) while Ministry of Regional Development, Construction and Housing and Communal Services accounts municipal solid waste generated in households and entities. Additionally, some data on waste management which can be different from abovementioned are published in regional reports of the Ministry of Ecology and Natural Resources of Ukraine. The difficulties in data interpretation can influence on the decision-making process, forecasting of future tendencies etc.

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5. CONCLUSIONS

The MSWM systems in post-soviet countries have low efficiency. Their efficiency level is comparable with EU countries of the third group – Latvia, Cyprus, Romania, Lithuania, Malta, Bulgaria and Greece. Essential shortcomings of the MSWM systems in analysed countries are: (1) insufficient legislation and regulation: the lack of the ban for landfilling, the lack of the regulation of the biodegradable waste, weak system of the forecasting and planning, outdated tariff policy and statistic accounting; (2) undeveloped capacity for recycling and treatment; (3) the lack of the effective economic instruments for the stimulating the recycling and reducing the waste generation.

During post-soviet period in analyzed countries the national strategies or other regulative documents on MSW management were developed and approved, but in general the MSWM system saves the list of soviet features (the service fees, the organization of the waste collection, removing, treatment and technic regulation). A number of the effective soviet tools and practices have been lost (the collection system for recyclables, the collection of food waste, awareness raising activities, etc.). The establishment of the institutional instruments in the new social, economic and political conditions has not yet been completed, as a consequences the governance gaps and implementation deficits could be observed.

BiPRO approach is based on the EU legislation and its aims, and obviously does not coincide with the objectives and legislation of the post-soviet countries. Nevertheless, the paper demonstrates the possibility of the BiPRO approach to identify weaknesses of the MSW sector with a view to its further improvement, as well as opportunities for comparison with other countries with different socio-economic conditions.

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REFERENCES

BiPRO (2012): Screening of waste management performance of EU Member States. Report submitted under the EC project "Support to Member States in improving waste management based on assessment of Member States' performance". Report prepared for the European Commission, DG ENV, July 2012. – 49 p.

Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31999L0031>.

Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0098>.

Concept on management of solid municipal waste and secondary raw materials, approved by the Order of the Ministry of housing utilities of the Republic of Belarus № 78 from 07.07.2014.

Integrated strategy on municipal solid waste management in Russian Federation, approved by the Order of the Ministry of natural resources and environment of Russian Federation № 298 from 14.08.2013.

Program of modernization of the municipal solid waste management system for 2014-2050, approved by the Decree of the Government of the Republic of Kazakhstan № 634 from 09.06.2014.