

NATIONAL STRATEGY FOR SOLID WASTE MANAGEMENT IN SERBIA

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Abstract

Inadequate waste management is one of the most serious environmental problems in the Republic of Serbia. This conclusion has resulted from numerous environmental assessments that have been carried out in the territory of the Republic over the recent years.

The problems related to waste management date far back and, as in most countries of East and South Europe, may be connected with periods of accelerated urbanization, which was not accompanied by appropriate environmental protection policy. It was therefore necessary to draw up the National strategy to develop a framework for waste management in our country which would, in the long term, enable European standards to be achieved.

This paper deals with National strategy of solid waste management in Serbia (which was adopted by Government of Serbia July the 5th), and is setting up activities for a long-term period. The establishment of a legislative-legal and institutional framework, the hierarchy of management of all kinds of waste, and economic instruments, and the implementation of the proposed framework will contribute to harmonization with EU standards in the future, which is an objective and intention of Serbia.

Introduction

The National Strategy of Waste Management in Serbia is the fundamental document in the creation of conditions for rational and sustainable waste management at the national level. The adopted Strategy of Waste Management in Serbia, in the next stage, is supported by a whole series of implementation plans for collection, transport, treatment and disposal of controlled wastes. The Strategy also considers the needs for institutional building, legislative development, education and public awareness. In order to provide for improved waste management, and to enable local and foreign investments in long-term sustainable activities, it is also necessary to identify economic, or financial mechanisms.

By implementing the fundamental principles of waste management as stated in the Strategy, i.e. by applying the principles that waste should be managed locally to the place where it is generated, the principle of prevention, the principle of separate collection of waste materials, the principles of neutralization of hazardous wastes, the principle of regional approach to waste disposal and rehabilitation of existing disposal and dump sites, will lead to implementation of the fundamental principles applicable in EU and will protect the environment and the coming generations.

The long-term strategy of the Republic in the field of environmental protection is: to improve the quality of life of the population by providing the desired environmental conditions and by preserving the natural environment based on sustainable environmental management.

The Strategy of waste management in Serbia :

- determines the principal directions in waste management in the future period, as result of developments in the economy, industry
- determines the principal directions in waste management based on EU strategic plans,
- determines the hierarchy of possible options of waste management,
- provides guidelines for activities in the field of harmonization of laws, which will, due to market conditions, be necessary in the process of accession to EU,
- identifies responsibilities in waste management and the significance and role of ownership over capital,

- defines objectives in waste management in the short-term and long-term period,
- defines the roles and responsibilities of individual stakeholders.

Specific objectives

Specific objectives of waste management are as follows:

- rational use of raw materials and energy and the use of alternative energy sources from waste,
- reduced risk of disposed waste to the future generations,
- utilization of national knowledge and national economic potentials in establishing a waste management system,
- implementation of an efficient administrative and professional organization,
- providing stable financing resources and incentive financial mechanisms for investments and implementation of activities on the "pollutant pays" and/or "beneficiary pays" principle,
- putting in place an IT system covering all flows of waste, quantities and locations of waste, treatment plants, processing and utilization of materials from waste and waste disposal facilities,
- increasing the number of population covered by systems for collection of municipal waste,
- establishing standards for waste treatment,
- reduction, re-use, recycling and regeneration of waste,
- reducing risks from wastes by applying the best techniques available and by substituting chemicals representing environmental and public health risk,
- building public awareness at all levels of society with respect to waste issues.
- Sustainable waste management

Waste classification

Waste is generally classified into controlled and uncontrolled waste.

Controlled waste includes household waste, commercial waste, clinical waste and industrial waste. These wastes can be inert, non-hazardous and hazardous.

Household waste, which is non-hazardous, is also named municipal waste, as waste generally collected from a certain territory, usually a municipality.

Uncontrolled waste includes agricultural waste and waste from mining and quarries.

In compliance with the EU waste management policy, the following types of waste are classified separately:

- municipal, commercial and non-hazardous industrial waste,
- packaging waste
- used accumulators and batteries
- used (obsolete) vehicles also known as ELV (End of Life Vehicles)
- used tires
- waste oils
- PCB waste
- hazardous waste
- electronic waste
- sludge from waste water treatment plants.

State of waste management in Serbia

Main conclusions regarding the state of waste management in Serbia are as it follows:

- organized collection of municipal solid waste covers about 60 – 70 % of the population,
- rural areas are not covered by the system of organized waste collection,
- apart from disposal, there is no treatment of municipal waste,
- the status regarding hazardous waste in Serbia is very problematic and complex and requires an integral approach in all aspects, from the moment of generation, through collection, transport, treatment and disposal,
- there is not a system of treatment plants for hazardous waste,
- there is no system for separate collection of medical waste, including household hazardous waste,
- there are no treatment plants for used vehicles and other specific types of waste,
- there is no system of separate collection and recycling of packaging waste and other municipal waste,
- there are no treatment plants for biodegradable waste,
- the existing dumpsites do not meet the EU requirements and standards,

- the fees for collection of municipal waste do not cover the actual costs of collection and disposal,
- there are no records of the total list of generators of hazardous waste, and no records of the full list of collectors of secondary raw materials,
- for most wastes, especially for hazardous waste, characterization has not been performed in accordance with legal regulations,
- there is legal basis for classification and categorization of hazardous waste, which is entered in data bases,
- so far there is not a single facility for permanent storage of hazardous waste that fulfills legal requirements, and temporary storage is done mostly in plants within factory grounds, very often in an inadequate manner,
- there is no efficient horizontal or vertical administrative and professional organization, full legislature nor economic measures in the field of waste management,
- there is no program to build public awareness concerning waste, its management and obligation to recycle.

Respecting the approved hierarchy in waste management, the following measures need to be undertaken:

1. adopt an action plan for waste management in line with EU principles,
2. prevent generation of waste, especially by introducing cleaner technologies, reducing hazardous waste and enforcing EU standards for maximum values of dangerous substances (ex. heavy metals) in products, by stimulating recycling, monitoring the state of the environment and assessment of life cycle of products,
3. establish an integral system in waste management from generation to disposal,
4. establish an information system regarding waste management, and adequate permitting
5. develop and implement financial instruments (payments, taxes, subsidies, etc.) to prevent creation of hazardous waste and incentives to re-use waste in the production process (hierarchy of wastes according to the principle: reduce . reuse – recycle)
6. introduce tax relief and other financial incentive instruments for enterprises allocating funds to environmental protection, recycling and reuse of waste as secondary raw materials. adopt municipal and company programs for waste management
7. adopt municipal and company programs for waste management introduce the obligation for separate collection of recyclable waste,
8. close and rehabilitate existing landfills which do not meet even the minimum environmental protection standards,
9. construct regional sanitary landfills,
10. construct transfer stations and collection centers for recyclable waste,
11. construct municipal waste incineration plants,
12. establish a national centre for hazardous waste treatment,
13. establish the possibility of existing industrial plants to be used for treatment of specific types of waste,
14. construct regional plants for storage of hazardous waste,
15. organize a system and construct plants for treatment of medical waste,
16. establish a system for treatment of bio-degradable waste,
17. establish a system for treatment of used vehicles,
18. establish a system for collection and treatment of fluorescent lamps,
19. establish a system for collection and treatment of packaging waste,
20. establish a system for collection and treatment of waste oils,
21. establish a system for collection and treatment of accumulators and batteries,
22. establish a system for collection and treatment of waste electronic and electrical devices and appliances.

In the Annex of this paper, is presented Table with all Technical / operational measures , long and short terms activities as they are proposed in Strategy of waste management in Serbia.

Literature:

1. M.Ilic, H.Stevanovic Carapina, and oth. - SWAMAP – Project :Municipal Solid Waste Management Plan – The Regional Environmental Center for Central and Eastern Europe, Country Office Yugoslavia, Belgrade 2002
2. M.Ilic, H.Stevanovic Carapina, A.Jovovic : Strategy for solid waste management, draft Material. Jan. 2003, Belgrade

Annex 1: Technical / Operative measures

	Activity / Measure	Description	Time
1	Organize collection stations for taking over bulk / hazardous / recyclable household waste	Collection stations for big-size/hazardous/household waste are plants where the general public may freely dispose of the big-size waste, free of disposal charge, and the waste may include: gardening waste, engine oil, old batteries, furniture or other obsolete goods. These stations may serve as collection centers for recyclable materials.	2004
2	Construction of «collection centers» for recyclable materials where citizens will bring their own waste	Collection centers refer to a certain territory where the population may bring clean, separated recyclable materials. Such centers are most often located in appropriate locations such as parking lots, supermarkets, recreation centers, etc. and are equipped with distinctly marked and colored containers for temporary storage of different recyclable materials... Collective centers for bigger towns, along with the collecting stations there will also be recycling centers in which recyclable materials will be processed on special recycling lines (paper, plastic, small piece glass, metal cans etc).	2004-2007
3	Close down all inadequate landfills	Serbia is in the process of developing plans to evaluate waste dumps and close down the existing inadequate waste dumps and landfills. In certain cases, the implementation of such measures is already under way.	2006
4	Rehabilitation of existing landfills, upgrading and monitoring for a longer time period (until regional landfills are built)	Serbia is currently analyzing the possibility for continued use of some existing waste disposal sites. In that respect, priorities will be set to some existing landfills covering the needs of several towns, to be rehabilitated up to the degree of presenting minimum environmental risk (under the given situation). In this way, inadequate waste disposal sites will be closed down and their number will be reduced.	2010
5	Restoration of all landfills that have been closed down	The existing waste disposal sites that have been closed down must be rehabilitated/restored in compliance with the laws in effect.	2005
6	Establish regional plants for receiving packaging, marking and labeling and temporarily storing potentially hazardous waste designated for treatment in Serbia or for cross-border export for treatment or return	It is proposed to construct regional plants (storages) for receiving, packaging, marking and labeling and temporarily storing potentially hazardous waste designated for treatment within Serbia or cross-border export for treatment/return outside Serbia. Since this is a very significant and pressing problem (there is no plant for treatment of hazardous waste in Serbia) such a plant should be constructed as a plant of high priority until 2004. Such regional plants must be built in compliance with IPPC Directive	End of 2004
7	Establish regional plants for separate collection and treatment of biohazardous waste	It is necessary to build regional plants for separate collection and treatment of bio-hazardous waste. Such plants must be equipped with modern technology and have an environmental permit in compliance with IPPC Directive.	2005
8	Construction of a national centre for high temperature incineration of combustible hazardous waste	Since there is no solution for permanent destruction of hazardous waste, it is necessary to develop strategic plans and build plants for incineration of hazardous waste. The return on the operation costs and investment costs for such plants will come from the private sector, i.e. waste generators. Such plants must be equipped with modern technology, especially for treatment of hazardous gasses, and must have an environmental permit in compliance with IPPC Directive.	2005

9	Construction of a national plant for physical-chemical treatment and stabilization of non-combustible hazardous waste	Our present information concerning the generation of waste indicate that there is sufficient quantity of non-combustible waste to require a plant for physical-chemical treatment and stabilization in Serbia. Preparatory work for such a plant requires systematic analysis of its location, a process of evaluation and selection, including a detailed environmental assessment. Plants of this kind must have an environmental permit in compliance with IPPC Directive.	2005
10	Establish plants to receive/ treat used oils, used tires, used batteries and accumulators,, obsolete vehicles and electronic devices	For the purpose of resolving the issues regarding treatment of other types of waste, it is necessary to consider alternative means for their treatment within the existing capacities in Serbia or to build other plants for collection/treatment of used oils, used tires, used batteries and accumulators, obsolete vehicles and electronic/electrical goods.. It is necessary to construct plants for electrical and electronic waste. Plants of this kind must have an environmental permit in compliance with IPPC Directive.	2004
11	Construct -plants for treatment/ processing/recycling of biodegradable waste (composting plant)	Within a regional approach to municipal solid waste management which is planned / implemented in Serbia, there is need for existing and future regional organizations for waste management to provide for treatment of biodegradable waste. Regional composting plants will be built in the medium term. Regional plants for treatment of biodegradable waste must have an environmental permit.	2009
12	Construct -plants for treatment of collected and separated packaging waste at source	In order to promote recycling of packaging materials, within collection centers (2) there will be plants for recycling of primarily packaging materials (paper, plastics, glass, Al). It is of great significance to promote the design of a system and plants for treatment of packaging materials separated and collected at source. These systems will be developed so that they function in a coordinated manner, and they will depend on the implementation of measures undertaken for the establishing of collection stations (1) and/or collection centers (2) described above, and separate municipal systems for collection of solid waste (and non-hazardous industrial wastes).	2004
13	Construct -plants for treatment / stabilization of sludge from municipal waste water treatment plants	It is estimated that in Serbia there is a certain quantity of untreated sludge resulting from municipal waste water treatment plants, which is most often disposed of to landfills. Information concerning capacities for treatment of this kind of sludge is not presently available, and the sludge is most often stored at sludge fields or disposed of to landfills. Sludge treatment plants must have an environmental permit.	2004
14	Construct regional landfills for disposal of -pre- treated, non-inert, non-hazardous waste in line with EU standards/best practices	It is proposed to build regional plants for disposal of municipal waste in compliance with EU standards, with capacities for up to 200.000 inhabitants. To that purpose, this study developed a plan for establishment of regions in Serbia from the point of view of building landfills. Regional landfills should be built until the year 2010, and in the meanwhile local waste disposal sites should be gradually closed down. It is planned that landfills shall be financed from donations, the private sector, municipal budgets and loans and credits.	2010
15	Construct -plants for disposal of certain (stabilized) hazardous wastes	Because of the lack of plants for destruction of hazardous waste, it is necessary to build plants for disposal of hazardous waste. Such plants must have an environmental permit (IPPC). It is urgent to identify a location for a landfill for disposal of hazardous waste	End of 2004
16	Construct plant(s) for incineration	It is planned in the long-term to build plants for incineration of waste. Plants for incineration of municipal waste must be	2015 - 2020

	of municipal waste	equipped with modern technology and in compliance with the IPPC Directive, i.e. they must have an environmental permit.	
17	Construct transfer stations	Transfer stations are an element within the system for integrated management of municipal waste, and they need to be built right away since they are needed in all methods of waste disposal for the purpose of transporting waste to remote locations.	2003-2010
18	Use cement factories and iron works for incineration of hazardous waste, or for use of alternative waste fuel.	Furnaces in cement factories may be used for incineration of certain types of hazardous waste, as they have a high temperature and a long retention time and with the appropriate gas scrubbing system... Such activities must be followed by IPPC permit	2005
19	Assess the possibility of continued use of existing plants for treatment of hazardous waste	It must be made analysis of possible use some already exist existing plants fir treatment some hazardous waste (recovery of solvents..)	2003
20	Rehabilitation of existing storages of hazardous waste to the level of meeting minimum environmental requirements	The existing storages in Serbia, located within factory facilities, need to be rehabilitated and minimum requirements must be fulfilled from the point of environmental protection.	2005
21	Use abandoned surface coal and ore mines to dispose of bulky waste and ashes.	Already contaminated soil should be used for disposal of great quantities of ash from power plant and mining waste	2005
22	Increase the use of ash from power plants as secondary raw material (cement plants, construction materials).	Under optimum conditions, it is possible in this way to use about two million tons of ash produced in Serbia. as alternative fuel in cement plants. All processes must be managed in accordance with IPPC requirements.	2007
23	Replacement of all devices with PCB/PCT oil, decontamination of devices, destruction of all hazardous wastes with PCB/PCT	Until the year 2015, all PCB/PCT containing devices should be replaced.	2015
24	Construct -plants to recycle construction materials	Recycling of construction waste is a widely accepted and practiced method of using construction waste and waste from pulling down of built structures.	2007
25	Closing down dirty technologies and their replacement with clean ones	Until the year 2010, the industry should adjust to requirements from the Directive on integral prevention and control of pollution.	2010
26	Remediation contaminated soil	All contaminated locations should be subject to remediation	2008
27	Reconstruction of existing open type incinerators and construction new	The technology used for processing animal waste is prescribed in EU Directive 1774, October 2002.. All animal waste must be in future treated according to requirements of EU Directives. Facilities must be constructed and reconstruct according to requirement of IPPC Directive, as well.	2005