



An EU funded project

Serbian Integrated Hazardous Waste Management Plan

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Closing Event

Date: 30th of May 2017

Integrated Hazardous Waste Management Plan

<p>12:10 – 13:10</p>	<p>Presentation of Project Component 2</p> <p><i>The Integrated hazardous waste management plan</i></p> <p><i>Specific waste stream plan on end of life vehicles management</i></p>	<p>Ms. Jelena Tesla Ministry of Agriculture and Environmental Protection</p> <p>Mr. Karl-Heinz Striegel Federal Republic of Germany</p> <p>Mr. Ion Nae Musetoiu Romanian Ministry of Environment</p>
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Integrated Hazardous Waste Management Plan

- Chapter 1 Introduction
- Chapter 2 **Legal framework** for the management of hazardous waste
- Chapter 3 **Organisation** of waste management, including division of responsibilities between **public and private sector** in the area of hazardous waste management
- Chapter 4 **Current Status** of the waste management regarding hazardous waste
- Chapter 5 **Existing** waste collection **system** and network of large waste recovery and disposal facilities including any treatment of waste oils, hazardous waste and special waste streams
- Chapter 6 **Expected types, quantities**, and origin of hazardous waste that will be produced in the Republic of Serbia, imported or exported into another country, including estimations related to generation of specific waste streams
- Chapter 7 Assessment of **needs** for new collection system, additional infrastructure in waste management facilities in compliance with self-sufficiency and proximity principles, and as necessary, **investments** into the construction of such infrastructure
- Chapter 8 Sources and amounts of **financial funds** for realisation of all waste management measures for hazardous waste
- Chapter 9 Determination of **objectives**
- Chapter 10 **Measures** and guidelines including manner and deadlines for implementation of the national plan
- Chapter 11 Criteria for **site identification** and necessary capacities of new establishments for recovery and/or disposal of waste

Chapter 7.2 Treatment options

technologies

sectors

Collective
schemes

PCB, POPs

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Chapter 7.2 Treatment options

*modular setting
and stepwise realisation !*

Conclusions

- 1. Separate collection and storage facilities** for hazardous household waste, operated by municipalities within “recycling yards” – **medium term option**.
- 2. Regional storage facilities**, operated by private operators of the sector, often in the context with treatment facilities – **short term option**.
- 3. Physical- chemical treatment facility** for inorganic and organic liquid hazardous waste and sludge combined with storage units for solvents, acids, bases etc. and for oily wastes and emulsions – **short term option**.
- 4. Additional capacities for incineration of organic industrial and medical waste**, combined with capacities for the preparation of „residues derived fuels“ (RDF) – **short and medium term options**.
- 5. Additional capacities for landfilling of inorganic industrial hazardous waste**, eventually combined with capacities for the solidification of pasty inorganic waste – **short and medium term options**.
- 6. Creation of a management system (collection, storage, dismantling and other treatment, final disposal) for all special waste streams** regulated by European and national waste legislation like used batteries and accumulators, waste oil, end-of-life-vehicles (ELV), waste from electric and electronic equipment (WEEE), – **short and medium term options**.

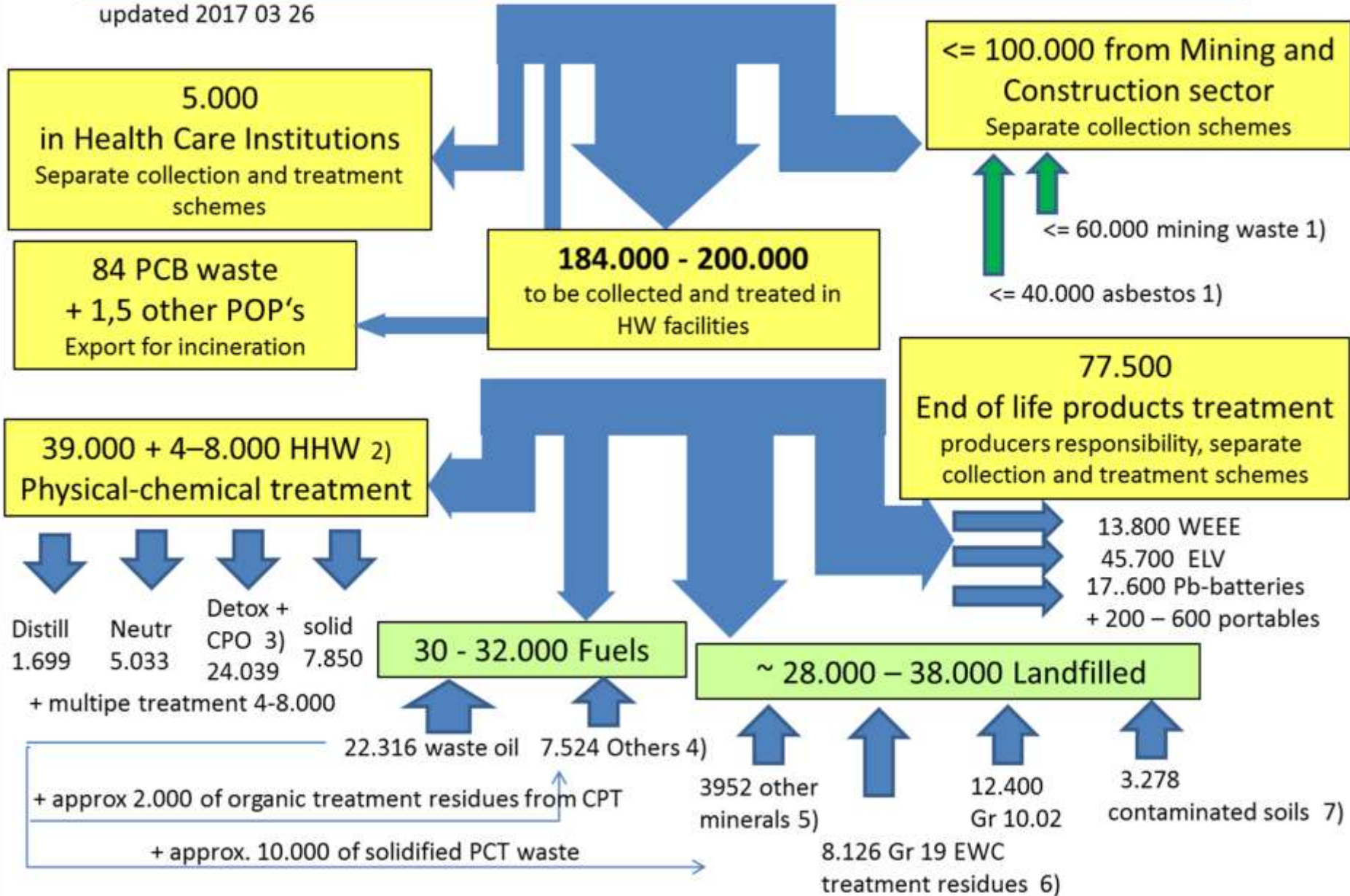
Expected types and quantities of hazardous wastes in Serbia related to treatment options, broken down according to the waste categories defined in the European Waste Statistics Regulation (EC 2150/2002).

Waste category (EWC-Stat)	Expected quantity of hazardous waste (t)	
1 Spent solvents	1,699	CPT DESTILLATION
3 Acid, alkaline or saline wastes	5,033	CPT NEUTRALISATION
4 Used oils	22,316	FUELS
6 Chemical Wastes (about 50% organic and 50% anorganic)	24,034	CPT DETOX + CPO
8 Industrial effluent sludges	7,850	CPT SOLIDIFICATION
10 Sludges and liquid wastes from waste treatment	699	LANDFILL
12 Health care and biological wastes	5,000	SPECIAL
17 Glass wastes	0	
22 Wood wastes	466	FUELS
24 Wastes containing PCB	84	EXPORT
26 Discarded equipment	13,800	SPEC COLL SCHEMES
28 Discarded vehicles	45,700	SPEC COLL SCHEMES
30 Batteries and accumulators wastes	18,000	SPEC COLL SCHEMES
36 Mixed and undifferentiated materials	3,952	LANDFILL
38 Sorting residues	6,897	FUELS
41 Mineral waste from construction and demolition	530	LANDFILL
43 Other mineral wastes (asbestos + waste from mining)	100,000	*)
45 Combustion wastes	12,400	LANDFILL
47 Soils	3,278	LANDFILL
51 Mineral waste from waste treatment and stabilised wastes	6,897	LANDFILL
TOTAL	278,635	

- 1) *) 40.000 t of Asbestos are not disposed of in HW facilities but in separate municipal landfill cells, 60.000 t of hazardous waste from mining industry are disposed of in separate facilities of mining industry
- 2) Hazardous waste from households (estimation based on EU28 Statistics)
- 3) 50% is inorganic detoxification and 50 % is organic waste treatment
- 4) FUELS: 6897+466+161= 7.524
- 5) „Other minerals“ without approx. 60.000 t of mineral hazardous waste from mining industry with apparently hazardous properties
- 6) 6.897+530+699 = 8.216
- 7) The estimation does not include the amount of excavated contaminated soils from future remediation activities

284.000 -300.000 tons/year total generated hazardous waste (HW) in 2020

updated 2017 03 26



Chapter 7.3 Investment & operational costs

*modular setting
and stepwise realisation !*

1. No additional investment for **collection infrastructure**.
 - Equipment will be adjusted step by step with increasing demand and revenues by private operators.
2. **Investment costs for storage and transfer facilities: 3 to 6 Mio €** for a small scale store and **10 – 15 Mio €** for a large scale storage facility.
 - if connected or even **integrated** into corresponding, privately operated treatment facilities, storage related investment costs diminish.
 - Capacities will develop step by step with increasing capacity of treatment facilities.
3. **Investment costs for physical-chemical treatment** plants depend on the technology applied and the complexity / variety of waste to be treated. The design of the processes depends on the required “quality” of the output. Investment costs range from **5 to 10 Mio €** for a small scale facility and from **10 to 20 Mio €** for a large scale treatment facility.
 - Considerable reduction of the operational costs can be achieved by good choice and follow-up of process steps.
 - Investment into existing, privately operated treatment facilities could decisively decrease the investment costs needed.

Chapter 7.3 Investment & operational costs

**Strengthening of
existing facilities!**

4. Investment costs of a new **incineration plant** are in the range of **50 to 80 Mio €**, depending predominantly from the exhaust gas treatment required.
Cement industry starts from lower investment costs of **15 to 30 Mio €**, depending on the exhaust gas treatment system required and the variety of waste to be incinerated in future.
First step investment (limited waste catalogue) ranges between **4,5 to 6 Mio €**. Investment costs for the **preparation of secondary fuels** (RDF) for cement kilns amounts to approx. **4 Mio €**, additionally.
5. Investment costs for a **hazardous waste landfill** depend from the site installation costs and from the technology applied. Sufficient capacity of the facility ($> 1 \text{ Mio m}^3$) reduces future operational costs decisively. Overall investment costs for a new hazardous waste landfill in Serbia are in a range of about **5 to 10 Mio €**.
 - Limited capacity for landfilling of hazardous waste in separate compartments of **existing Serbian landfills** in the range of 15.000 tons per year can be made available in near future; this could **reduce urgency** and **decrease** necessary total investment volume.
 - New landfill capacities could also be located within **industrial areas**. They might be docked to **industrial facilities** where necessary experience in hazardous substances' handling, space and equipment are available. This can **decrease** the total investment volume as well.

Chapter 7.3 Investment & operational costs - Conclusions

1. Estimated costs for **short term investment program** = **59 Mio €**
 2. Additional costs for a medium term investment program = **122 Mio €**
 3. Additionally about **8** (short term) **and 19** (medium term) **Mio €** are related to the establishment of new infrastructure for **specific waste streams** like mentioned above (without PCB elimination program).
 4. = In total approximately **208 Mio €**
-

Such investment can be reduced by concentrating such activities in one **central treatment and disposal facility** (e.g. **34 Mio €** for a center in Morocco, without thermal treatment) or by **adjustment of existing facilities**.

- New sites demand long preparation phases for **assessment procedures** – often with **unpredictable results**. Integrating hazardous waste management activities – storage, treatment and incineration units – into **industrial complexes and process lines** is **more promising**.
- This is a more **decentralized approach** with **modular systems** to be added step by step with increasing demand and know-how. Knowledge about hazardous substances increases progressively. **Costs decrease**.

Chapter 8 Financing **investments**: Financial resources

1. Investment needs for hazardous waste management in Serbia amount to a total of approx. **208 million €**. Related to the estimated total investment need of **958 Mio €** for total solid waste management system (Strategy 2015) this is rather limited.
2. The system will be financed from a combination of the following **financial resources**:
 - Capital grants from the former Serbian Environmental Protection Fund (EPF)
 - Funds from the private sector realizing such projects as PPP projects;
 - Capital grants through European Pre-Accession Assistance (EU IPA);
 - Funds from national or regional governments and public utility companies
 - Long-term loans from international financial institutions (IFI);
 - Capital grants from bilateral donors.
3. At this moment it is not possible to specify in detail the contribution of these funds, but:.
 - **IPA and later Cohesion and other EU funds** will contribute the largest part of **public funds** for such investments in Serbia.
 - Another essential part has to be taken by the **private sector** from its own capital and/or long-term commercial loans. This includes: national industry, international and national **operators** and national private institutions/organizations (**collective schemes**)

Generally, **70%** of financing is **IPA** and other international support funds and **30%** is national co-financing, mostly from **private sector**.

Chapter 8 EU financing scheme and private sector financing

Based on the experience of other new MS, the **financial resources** from EU financing of **environmental investments** are as follows:

- 90% of EU funds for environment are directed to **infrastructure investment**
- 70% of investment funds will be allocated for **water sub-sector projects**
- **30% of investment funds will be allocated for waste management sub-sector.**

Under such assumptions the **total funds for waste sector** may be expected as presented in the table from the Serbian WM Strategy. This means, that most of investment into **hazardous waste management infrastructure** can be completed during next **two financing periods (up to 2027)**.

	Financing period 2014-2020	Financing period 2021-2027	Financing period 2028-2034	Total in Mio €
Water and waste management infrastructure financing EU	144	1.288	1.288	2.719
National co-financing 30%	62	552	552	1.165
Total funds	206	1.839	1.839	3.884
30% of funds for waste management	62	552	552	1165

Chapter 8 Financing **operational costs**:

- **Economic constraints and solutions**

1. Approved **economic instruments** help to decrease the expected financial deficit resulting from necessary investments. These instruments include a strict **cost recovery policy** and **additional disposal fees**.
2. Prices must reflect the **long-term costs** including loan servicing and repay, replacement costs, environmental monitoring programs, costs devoted to the plant shutting down and business risks.
3. **But:** In order not to overstress the **acceptability** of such new financing systems, they must be introduced gradually, enabling the users to adapt to higher prices. **Grants and subsidies** may help to facilitate the **transition** to full cost recovery system. EU MS adopted individual procedures for finding **affordable prices** (i.e. related to share of GNP or turnover of sectors).
4. **And:** Improvement of the **polluter-pays-principle** in Serbia means to reduce the public burden of costs.
The instrument of **extended producer responsibility** includes **Collective schemes** for all waste types where corresponding EU requirements exist (WEEE, batteries, ELV, waste oil, packaging waste).



Chapter 8 Financing **operational costs** - Solutions

5. An **Environmental Protection Fund** (EPF) should be re-established as a **separate non-profit organization** for **co-financing the infrastructure** for hazardous waste management and other issues like remediation of contaminated sites and stock-piles (“black spots”) and for co-financing of innovative solutions (e.g. waste prevention incentives in the industry).



5. Apart from “fees for products put on the market”, the **income of the EPF** could be secured by imposing:
 - “**fees on the use of the environment**” (example from Poland),
 - “**fees on waste disposal activities**” (example from Austria) or
 - by allocating an **adequate budget** from the general budget and allocating **fees and fines for infringements** against environmental law (example from Germany).

The key principles:

- Sustainable development principle;
- Principle of hierarchy of measures in waste management;
- Precautionary principle;
- Principle of vicinity and **regional approach** in waste management;
- Principle of selection of the most favourable option for the environment;
- “**Polluter pays**” principle
- Extended **producer responsibility**

Objectives

Strategic objectives as laid down in the **Serbian Waste Management Strategy**:

- Harmonization of national regulations with EU legislation; adopting an IHWMP; **strengthening administrative capacities**;
- Establishment of responsibilities within the regions
- Establishment of an integrated management system for hazardous industrial waste, medical and pharmaceutical waste and for special waste streams with hazardous components
- Development of incentives for **reducing industrial hazardous waste** implementing ...instruments to advise about cost reduction, material saving etc.
- Promotion of **material re- use** of hazardous waste and of use as an **alternative source of energy**
- Allocation of hazardous waste **landfilling capacities**; rehabilitation of existing hazardous waste **dumps** with particular risk for the environment, elimination of "**black spots**" with historical contamination of hazardous substances.

Action Plan (Strategy 2015) - excerpts concerning hazardous waste -



„In the short-term period...

- During the first phase it will refer to the construction of several regional **storages** for hazardous waste and to the **physical-chemical treatment of inorganic waste**. (better: „upgrade and enlargement of capacities for ... hazardous waste from industrial processes“)
- **NEW:** Cement plants are to be encouraged to enlarge their technical abilities to prepare and use hazardous waste streams as alternative fuel or secondary raw material.
- Based on the Law on Waste Management, the system of **specific waste streams management** is to be established and economic instruments are to be introduced.
- As one of the priorities for resolving the problems of hazardous waste, it is necessary that the possibilities and conditions for **using the existing plants and installations** should be taken into consideration (treatment plants, cement plants, thermal plants, heating plants, steelworks plants) for the purpose of hazardous waste treatment.

„In the long-term period Serbia should focus on the achievement of the **objectives** in...

- constructing a plant for energy recovery from municipal waste, as well as construction of a **central plant (better: unit) for hazardous and medical waste incineration**.“

Integrated system means..

Chapter 10 Measures and timeline

Until when
H = 2022 ?

Regulatory measures: few adaptations, precisions necessary for remaining gaps	Priority H
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Operative Instruments	Priority
<ul style="list-style-type: none"> • Liabilities and obligations, financing • Administrative capacities and procedures (Permitting, inspection, documents) • Decentralisation and regional responsibilities, planning and management methods, indicators, cooperation and information exchange • Establishment of an infrastructure for hazardous waste by private investment • Creation of a system for special waste streams (collective schemes) • Promotion of re-use of waste as an alternative source of fuel (testing, temporary permits, monitoring for wider range of wastes) 	H

Market based Instruments	Priority
<ul style="list-style-type: none"> • Participation of the private sector • Transposition of the extended producer responsibility • Develop different forms of private sector participation • Install new mechanisms to fix operational costs and affordable service prices 	H

Information based Instruments ...	Priority

Voluntary Instruments and voluntary agreements	Priority
<ul style="list-style-type: none"> • Examine if voluntary agreements with industrial sectors or single firms can replace strict legal obligations (mining waste, construction sector?) “awareness raising campaign” 	H

Thanks for the opportunity to assist You!

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Measures concerning...

Reglementary Instruments:

- Transpose Strategic Environmental Assessment (SEA), Environmental Impact Assessment (EIA), Improve public participation

Operational Instruments:

- RDF activities: tests, temporary permits, monitoring, new storage and feeding units
- Planning activities: Coordinate spacial planning and IHWMP, coordinate data and findings, coordinate activities and know-how of administration and institutions
- Integrated procedures for permitting and inspection, coordinate permitting and inspection activities , improve jurisdiction and sanctions
- Cooperation of industry and administration
- Establish „document of movement“ for hazardous waste only

Market based Instruments:

- Increase motivation to invest: which needs „confidence to rules and data“ + legally binding plans + harmonized incentives + sanctions for infringements
- Public incentives for new technologies
- Competition in tenders and concessions, deregulated prices