



An EU funded project

2nd Workshop

Development of the Integrated Hazardous Waste Management Plan

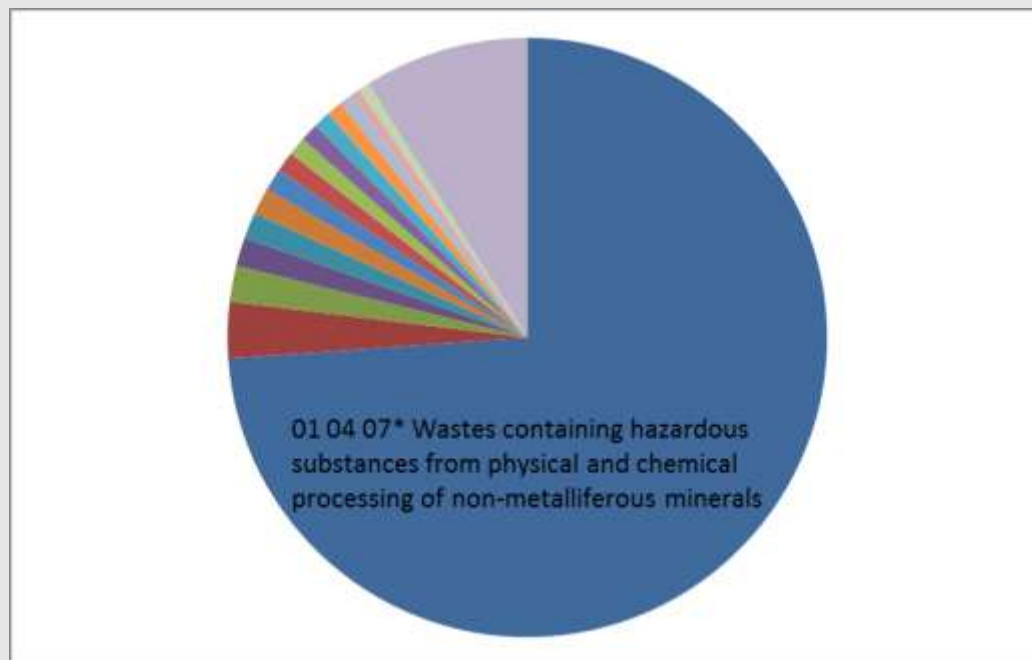
23rd of September 2016

Current status of generation and management of hazardous waste in Serbia

- I. Quantities of hazardous waste generated**
- II. Quantities of hazardous waste landfilled**
- III. Quantities of hazardous waste used for energy recovery**
- IV. Quantities of hazardous waste used/prepared for material recovery**
- V. Quantities of hazardous waste exported**
- VI. Summary of the waste streams**
- VII. Collection of hazardous waste**
- VIII. Treatment facilities for hazardous wastes**

Quantities of hazardous waste generated

- Total quantity of industrial/commercial hazardous wastes generated in 2014: 209,900 t
- The biggest part (155,000 t): wastes from mining and quarrying

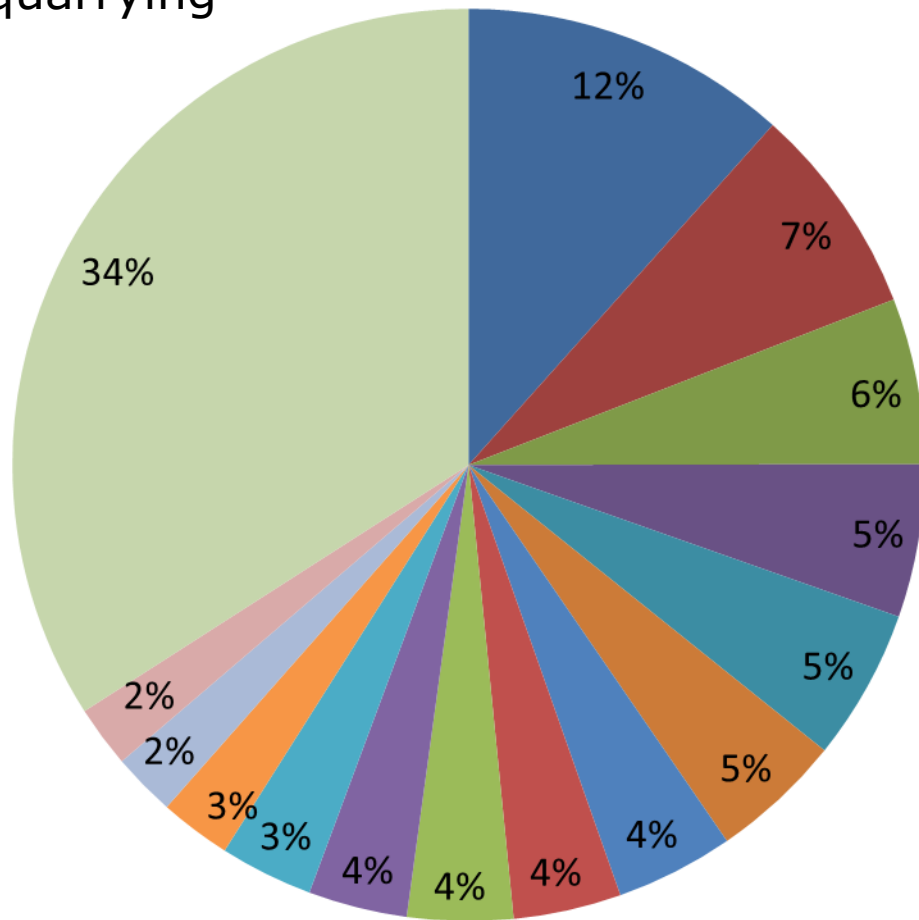


Source: SEPA (2015)

Quantities of hazardous waste generated by industry and commerce

Waste type		Amount (t) 2014
01 04 07*	Wastes containing hazardous substances from physical and chemical processing of non-metalliferous minerals	155,044
10 02 07*	Solid wastes from gas treatment containing hazardous substances	6,370
10 02 13*	Sludges and filter cakes from gas treatment containing hazardous substances	4,099
16 03 03*	Inorganic wastes containing hazardous substances	3,222
05 01 06*	Oily sludges from maintenance operations of the plant or equipment	2,975
13 01 05*	Non-chlorinated emulsions	2,940
05 01 03*	Tank bottom sludges	2,555
13 01 11*	Synthetic hydraulic oils	2,294
16 07 08*	Wastes containing oil	2,096
13 05 06*	Oil from oil/water separators	2,055
16 01 07*	Oil filters	1,923
17 05 03*	Soil and stones containing dangerous substances	1,812
12 01 09*	Machining emulsions and solutions free of halogens	1,385
16 02 15*	Hazardous components removed from discarded equipment	1,229
16 01 04*	End-of-life vehicles	1,197
	Other waste types	18,680
total		209,876

Hazardous waste generated, without wastes from mining and quarrying



- 10 02 07* Solid wastes from gas treatment
- 10 02 13* Sludges and filter cakes from gas treatment
- 16 03 03* Inorganic wastes
- 05 01 06* Oily sludges from maintenance operations of the plant or equipment
- 13 01 05* Non-chlorinated emulsions
- 05 01 03* Tank bottom sludges
- 13 01 11* Synthetic hydraulic oils
- 16 07 08* Wastes containing oil
- 13 05 06* Oil from oil/water separators
- 16 01 07* Oil filters
- 17 05 03* Soil and stones containing
- 12 01 09* Machining emulsions and solutions free of halogens
- 16 02 15* Hazardous components removed from discarded equipment
- 16 01 04* End-of-life vehicles
- Other waste types

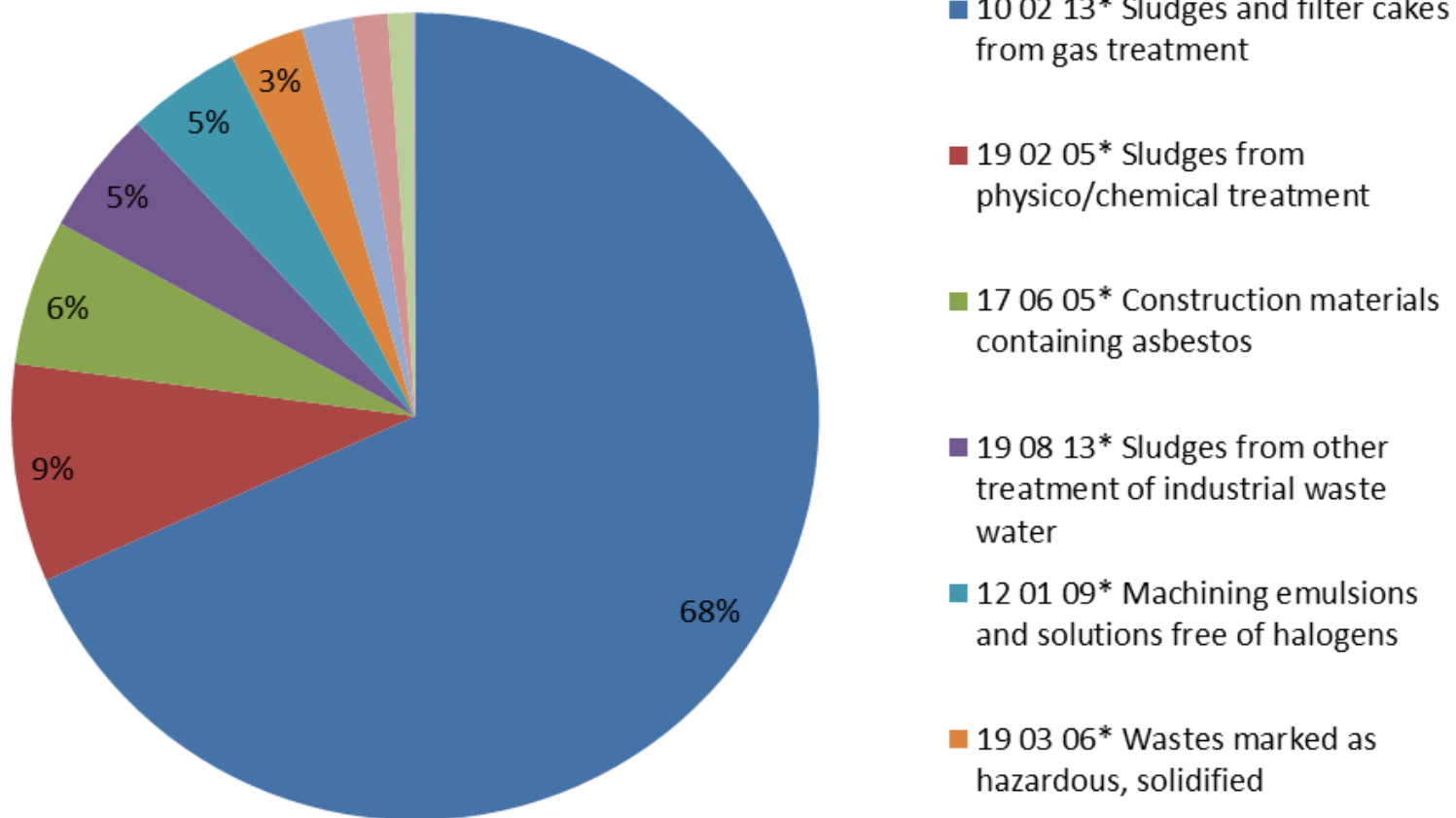
Source: SEPA (2016)

Quantities of hazardous waste landfilled

Waste type		Amount (t) 2014
10 02 13*	Sludges and filter cakes from gas treatment containing hazardous substances	4,097
19 02 05*	Sludges from physico/chemical treatment containing hazardous substances	524
17 06 05*	Construction materials containing asbestos	350
19 08 13*	Sludges containing hazardous substances from other treatment of industrial waste water	300
12 01 09*	Machining emulsions and solutions free of halogens	273
19 03 06*	Wastes marked as hazardous, solidified	178
12 01 12*	Spent waxes and fats	122
17 06 03*	Other insulation materials consisting of or containing hazardous substances	85
17 09 03*	Other construction and demolition wastes (including mixed wastes) containing hazardous substances	60
17 06 01*	Insulation materials containing asbestos	5
total		5,995

Source: SEPA (2016)

Hazardous wastes landfilled



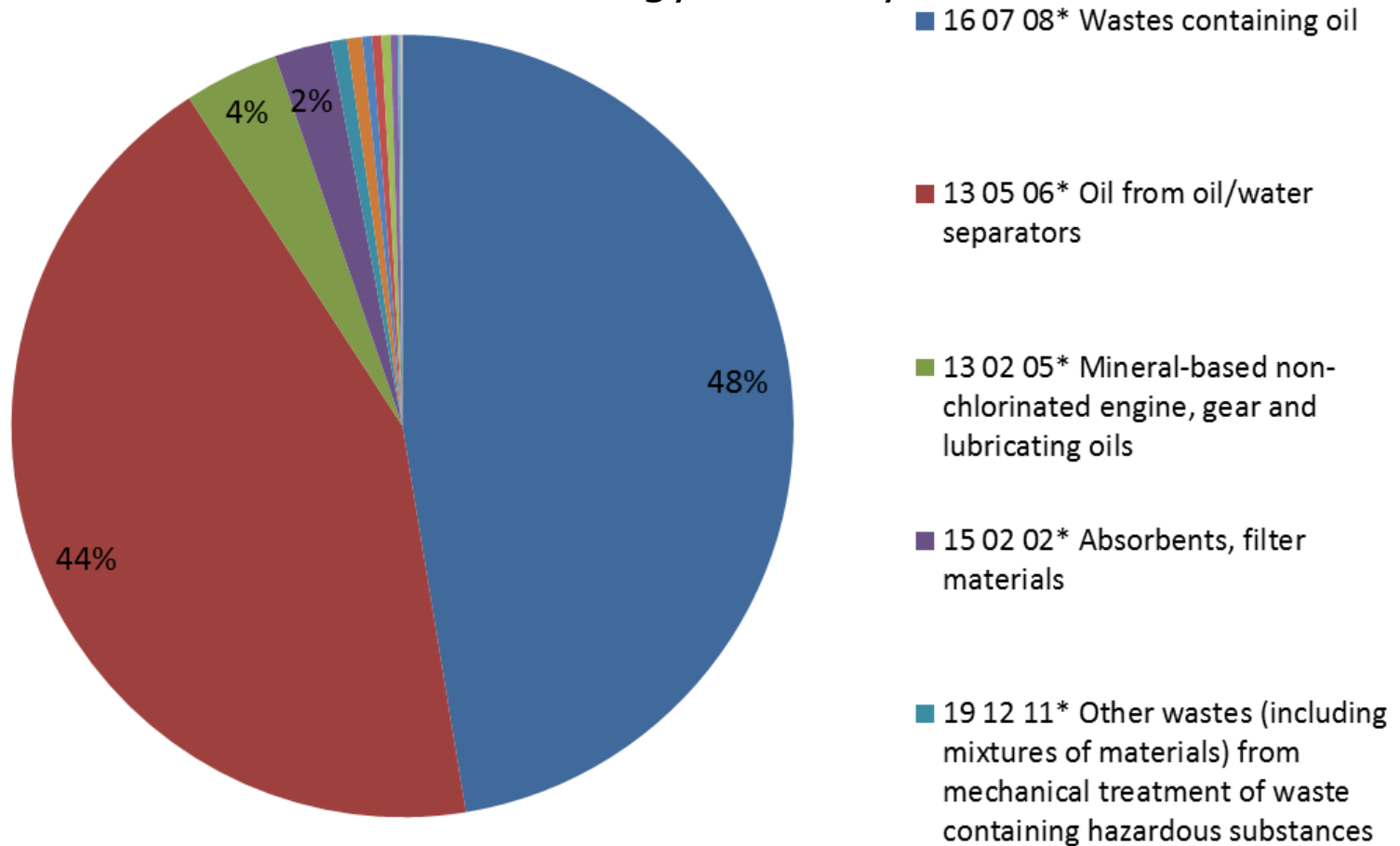
Source: SEPA (2016)

Quantities of hazardous waste used for energy recovery

Waste type		Amount (t) 2014
16 07 08*	Wastes containing oil	2,038
13 05 06*	Oil from oil/water separators	1,866
13 02 05*	Mineral-based non-chlorinated engine, gear and lubricating oils	168
15 02 02*	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by hazardous substances	100
19 12 11*	Other wastes (including mixtures of materials) from mechanical treatment of waste containing hazardous substances	29
13 08 99*	Wastes not otherwise specified	27
	Other waste types	68
	total	4,296

Source: SEPA (2016)

Hazardous wastes used for energy recovery



Source: SEPA (2016)

Quantities of hazardous waste used for recycling / material recovery (R2-R11)

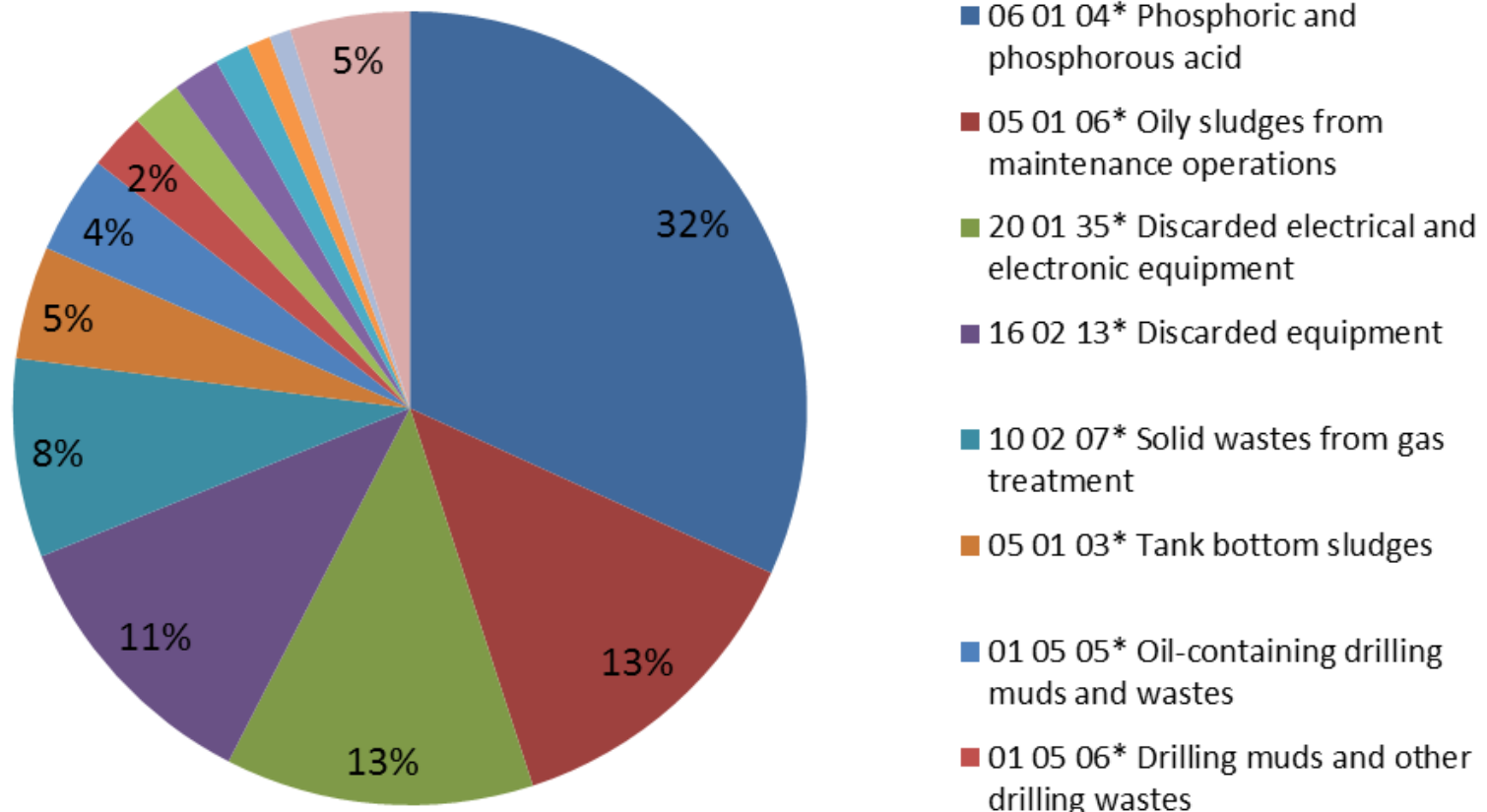
Waste type		Amount (t) 2014
06 01 04*	Phosphoric and phosphorous acid	23,902
05 01 06*	Oily sludges from maintenance operations of the plant or equipment	9,900
20 01 35*	Discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components	9,442
16 02 13*	Discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12	8,542
10 02 07*	solid wastes from gas treatment containing dangerous substances	6,086
05 01 03*	Tank bottom sludges	3,456
01 05 05*	Oil-containing drilling muds and wastes	3,000
01 05 06*	Drilling muds and other drilling wastes containing dangerous substances	1,750
18 01 03*	Wastes whose collection and disposal is subject to special requirements in order to prevent infection	1,540
16 06 01*	Lead batteries	1,434
13 08 99*	Wastes not otherwise specified	1,053
	Other waste types	5,038
total		75,143

Quantities of hazardous waste used for recycling / material recovery – recovery operations

Code	Type of recovery operation	Amount (t) 2014
R2	Solvent reclamation/regeneration	348
R3	Recycling/reclamation of organic substances which are not used as solvents	658
R4	Recycling/reclamation of metals and metal compounds	26,579
R5	Recycling/reclamation of other inorganic materials	24,559
R7	Recovery of components used for pollution abatement	4,164
R9	Oil re-refining or other reuses of oil	2,646
R10	Land treatment resulting in benefit to agriculture or ecological improvement	15,907
R11	Use of wastes obtained from any of the operations numbered R1 to R10	280
	total	75,143

Source: SEPA (2016)

Hazardous waste used for recycling / material recovery

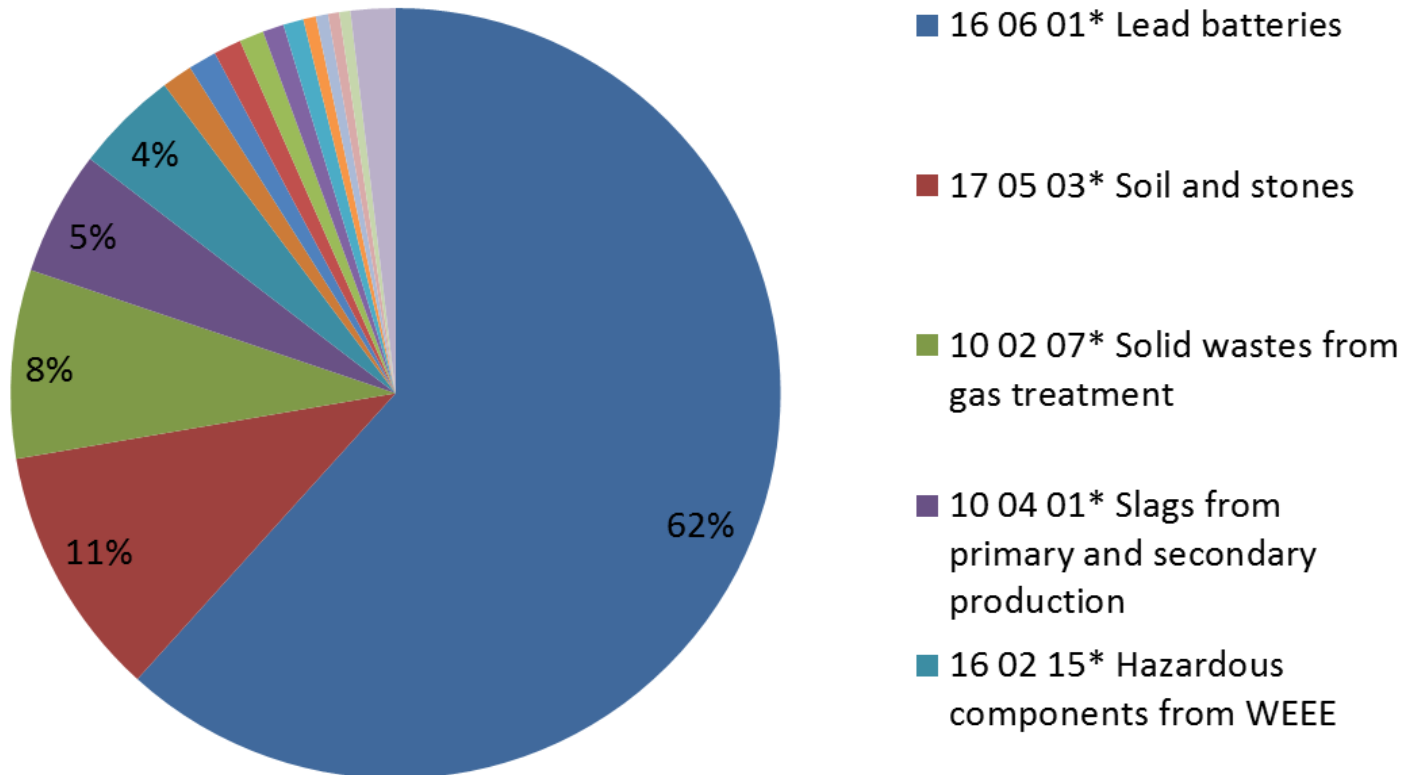


Source: SEPA (2016)

Quantities of hazardous waste exported

Waste type		Amount (t) 2014
16 06 01*	Lead batteries	15,427
17 05 03*	Soil and stones containing hazardous substances	2,645
10 02 07*	Solid wastes from gas treatment containing hazardous substances	1,978
10 04 01*	Slags from primary and secondary production	1,308
16 02 15*	Hazardous components removed from discarded equipment	1,084
08 01 13*	Sludges from paint or varnish containing organic solvents or other hazardous substances	321
16 08 02*	Spent catalysts containing hazardous transition metals or hazardous transition metal compounds	297
10 04 02*	Dross and skimmings from primary and secondary production	290
07 05 13*	Solid wastes containing hazardous substances	256
20 01 35*	Discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components	222
08 01 11*	Waste paint and varnish containing organic solvents or other hazardous substances	213
	Other waste types	963
	total	25,004

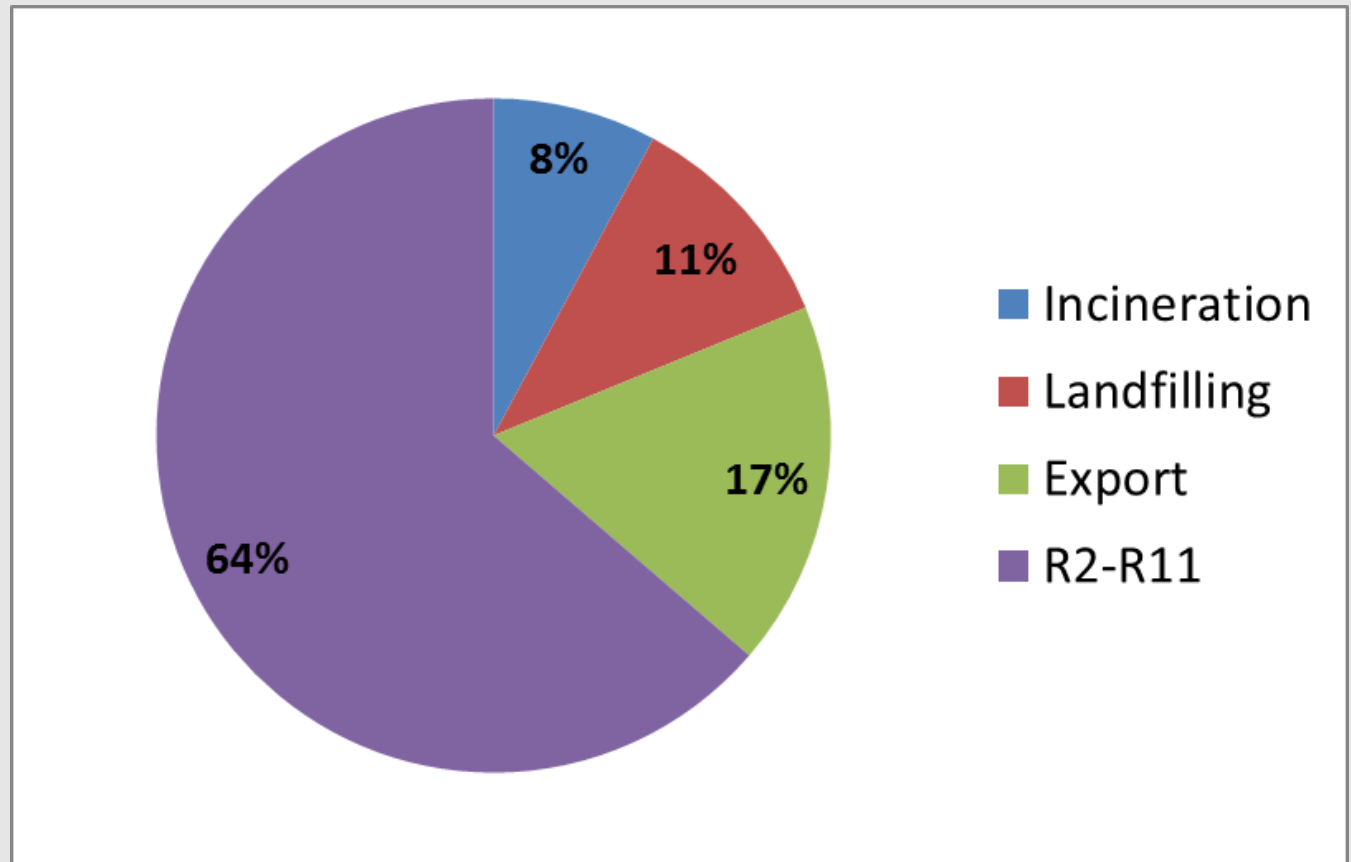
Hazardous wastes exported



Source: SEPA (2016)

Treatment of the industrial/commercial hazardous waste

Total quantity generated: 54,720 t
(without wastes from mining and quarrying)



Source: SEPA (2016)

Waste category (EWC-Stat)	Generation (t)	Energy recovery (t)	Landfilling (t)	Export (t)	R2-R11 (t)
1 Spent solvents	98			5	
3 Acid, alkaline or saline wastes	1,359			67	23,927
4 Used oils	12,415	2,072	395		20,858
6 Chemical Wastes	11,296	144		1,458	
8 Industrial effluent sludges	2,762	2,038	300		
10 Sludges and liquid wastes from waste treatment	595		524	74	29
12 Health care and biological wastes	2,682	13			1,544
17 Glass wastes	0				
22 Wood wastes	397				
24 Wastes containing PCB	72			128	
26 Discarded equipment	4,824	2		1,306	18,065
28 Discarded vehicles	1,197				720
30 Batteries and accumulators wastes	753			15,427	1,434
36 Mixed and undifferentiated materials	3,348			117	36
38 Sorting residues	231	29		128	14
41 Mineral waste from construction and demolition	335		145		2
43 Other mineral wastes	155,155		354		1,750
45 Combustion wastes	10,513		4,099	3,649	6,112
47 Soils	1,812			2,645	652
51 Mineral waste from waste treatment and stabilised wastes	32		178		
Total	209,876	4,296	5,995	25,004	75,143

Source: SEPA (2016)

Some conclusions and remarks

- There are discrepancies between generated and treated quantities. Reasons for the discrepancies include:
 - **Temporary storage**
 - Data of SEPA on waste generation covers only wastes from industrial/commercial sources. There is no exact information available on the generation of **hazardous wastes from households**. The treated quantities of hazardous wastes sometimes also include wastes from households.
 - The quantities of hazardous wastes reported as recycled/recovered may include double countings because of subsequent treatment steps (e.g. dismantling of WEEE followed by recycling)
 - Quantities of hazardous wastes recycled/materially recovered partly remain unclear. Sometimes the allocation of **R-codes** seems to be questionable (R10 for hazardous waste?).
- The data on waste generation 2014 includes 155,044 t of wastes from **mining and quarrying** (category “Other mineral wastes”), which as of the reference year 2015 are not anymore included in the SEPA-statistics on hazardous waste generation.
- Comparisons with the data from other countries indicate, that the generated quantities of certain waste categories are low in Serbia. This implies that these waste streams are not collected separately but co-disposed with other waste.

Collection systems for hazardous wastes in Serbia

- Currently the collection system for hazardous wastes from industry and commerce is primarily based on the economic value of the waste.
- Hazardous waste from households is collected in the context of special waste streams (WEEE, batteries, etc.). For other hazardous wastes from households (e.g. waste oil, medical waste, varnishes) no regular collection system has been established.
- According to the database of SEPA, about 250 permits for the collection of hazardous waste have been issued by 20.9.2016. Furthermore, 140 permits have been issued for the storage of hazardous waste.

Existing treatment facilities for hazardous waste

- **Incineration:** Two cement plants have a permit (Lafarge BFC and Holcim) for treatment of hazardous wastes.
- **Landfills:** 6 landfills have a permit for disposal of hazardous waste – 3 of them dispose mainly asbestos containing waste. One of the landfills (Smederevograd) has relevant capacities for industrial wastes.
- **Chemical-physical treatment:** At least 5 facilities, which had a permit at the end of 2015 can be classified as chemical-physical treatment plants. All of these are small facilities with capacities $\leq 3,000$ t/a.
- **Treatment of hazardous medical wastes:** at least 47 permitted facilities
- **Treatment of contaminated soils:** at least two plants
- **Treatment/packing of asbestos:** at least three facilities
- **Recovery/recycling:** the status remains unclear

Thank you!