



MINISTRY OF THE ENVIRONMENT OF THE SLOVAK REPUBLIC



**STATE OF THE ENVIRONMENT REPORT
SLOVAK REPUBLIC 2006**





Exploitation of nuclear energy must be justified by the contribution, which would counterbalance eventual risks originating from such activities, especially in comparison with other ways, which can be used to reach the same goal.

§ 3 par. 3 of the Act No. 541/2004 Coll. on Peaceful Exploitation of Nuclear Energy (Nuclear Act)

ENVIRONMENTAL RISK FACTORS

• PHYSICAL RISK FACTORS

Radiation protection

In February 2006, **Act 126/2006 Coll. on public health and amendments to other laws** was adopted. Provisions of the Act include among the responsibilities the implementation of the radiation situation and collection of data on the Slovak territory with the objective to assess the impact of radiation on public health. The implementing agency is the Public Health Authority of the Slovak Republic (PHA SR) in cooperation with the following ministries: Construction, Defense, Environment, Education, Agriculture, and Economy. PHA SR ensures and oversees activities of the central office for radiation and monitoring network, set forth in the SR Government Resolution no.347/2006 Coll.

◆ **Air dose equivalent rate**

Input of the external photon dose equivalent in air H ($\text{nSv}\cdot\text{h}^{-1}$) in 2006 in the early alarm networks of in the whole SR territory reached the average value of $107.1 \text{ nSv}\cdot\text{h}^{-1}$. Average annual effective dose E (μSv) for the whole SR territory was $937 \mu\text{Sv}$ in 2006.

◆ **Air Contamination**

Air contamination has continually been monitored by measuring the volume activity of individual radio nuclides in **aerosols** extracted in the ground atmospheric level. Their ^{137}Cs concentration in Slovakia in 2006 reached average value $5 \mu\text{Bq}\cdot\text{m}^{-3}$.

In 2006, no major air contamination by man-made radionuclides was detected, ^{137}Cs radionuclide concentration in **radioactive fallout**, originating in the upper atmospheric layers as a result of nuclear weapons tests, was about $3.5 \text{ Bq}\cdot\text{m}^{-2}$ in Slovakia.

◆ **Contamination of other environmental compounds**

Average soil contamination by the ^{137}Cs radionuclide in 2006 was about $2.8 \text{ Bq}\cdot\text{kg}^{-1}$. Average activity of the ^{137}Cs radionuclide **in water** in 2006 was below $0.01 \text{ mBq}\cdot\text{l}^{-1}$. Average tritium activity **in water** was at the level of $2.2 \text{ Bq}\cdot\text{l}^{-1}$.

◆ **Contamination of foodstuff and agricultural products**

Of all man-made radionuclides, in 2006, just like in the previous years, it was possible to detect in food samples only the ^{137}Cs radionuclide. Its contents in all measured commodities – excluding grasses and fungi – were around the level of units of $\text{Bq}\cdot\text{kg}^{-1}$, or rather $\text{Bq}\cdot\text{l}^{-1}$.

◆ **Radon and its radioactive decay products**

The basic public health legislation on protection against the adverse effects of ionizing radiation is Act 126/2006 on **public health and amendments to other laws**, which superseded the former Act and Resolution.

Source of radiation	Radiation load	
	Person (mSv)	Population (10^5 manSv)
Natural background together. from that:	2.94	650
- cosmic radiation	0.39	
- terrestrial gama radiation	0.46	
- radio-nuclides in body	0.29	
- radon and the products of mutation	1.80	
Medical exposure together. from that:		
- diagnostics	0.8 – 1.0	
- radiotherapy	-	
Atmospheric testing of nuclear weapons	-	30
Radio-nuclides outlet	-	2

Source: PHA SR

Nuclear institutions

State Inspection of Nuclear Safety with handling radioactive waste and burnt nuclear fuel is carried out by the **Office of Nuclear Supervisions of the SR** (NRA SR). The Act No. 541/2004 Coll. on peaceful exploitation of nuclear energy (“**Atomic Act**”) is the basic instrument for peaceful use of nuclear energy. In 2006, 13 new executing resolutions were published, building on the atomic act. The

resolutions are fully in compliance with the EU legislation in the given area. Slovakia is a signatory to all major international agreements and conventions in the area of peaceful exploitation of nuclear energy.

In Slovakia, there are altogether 6 operated blocks of nuclear power plants (NPP) with nuclear reactors of the VVER-440 type.

List of operated nuclear power plants in the SR

Nuclear Power Plant (NPP)	Start of operation	Reactor type	Operator
NPP Bohunice V-1	1978, 1980	VVER 440/230	SE
NPP Bohunice V-2	1984, 1985	VVER 440/213	SE
NPP Mochovce 1,2	1998, 1999	VVER 440/213	SE

Source: SE

♦ Activity of nuclear institutions in SR

NPP V-1 Bohunice

With both NPP – EBO V-1 blocks in operation in 2006, there were 11 occurrences, 8 of them within the INES 0 degree, and none in the INES 1 degree.

NPP V-2 Bohunice

In 2006, planned shutdowns were implemented at the NPP V-2 blocks for fuel-changing purposes together with overhauls, with the objective to carry out modernisation and ensure a better safety. The most critical role of the NPP V-2 modernization in the area of control and management systems is to replace and improve the original systems of block safety, as well as the automatic shutdown of reactors in order to introduce new, programmable computer systems. This year, both NPP V-2 blocks switched to a new nuclear fuel type.

In 2006, both NPP V-2 blocks detected 17 operation occurrences, 12 of them assessed under the INES 0 degree. This year, most attention was directed to launching of the 4th block, after a change in fuel.

Based on the results of control activities and assessment of the safety indicators, together with inspection activities, NRA SR evaluated the operation of both NPP V-2 blocks as safe and reliable.

NPP Mochovce 1,2

In 2006, both blocks were subject to planned shutdowns due to overhauls and fuel changes. Meanwhile, investment projects were carried out with the objective to continually increase the nuclear safety, building on the experience from operating the blocks. Maintenance works were carried out at both blocks. The hermetic zone of the blocks was subject to maintenance, in order to ensure high tightness of spaces and prevent the leak of radioactive substances into the environment.

Number and type of occurrences in 2006 did not show any unusual technical malfunctions. In 2006, there were 24 occurrences in NPP Mochovce, 9 of which were classified under the INES 0 degree.

In terms of nuclear safety, systems and devices functioned reliably the whole year long.

Nuclear power plants under construction

NPP Mochovce 3,4 consists of two VVER 440 blocks with the V-213 type reactors with increased safety. Slovak Electric Power Plants, Ltd. is the owner of the power plant under construction. After the construction of both of its blocks ceased in 1994, the plant was conserved. Nowadays, there are undergoing conservation, protection, and evaluation works to assess the their usefulness for the **process of completion**.

Nuclear power plants to be phased out

The nuclear power plant A-1 of Jaslovské Bohunice that uses natural uranium and a heavy water reactor cooled by carbon dioxide (HWGCR – 150MW) was shut down in 1977 after an INES 4 accident. Currently, the plant is in its **first phaseout stage**.

Operated nuclear facilities

Jaslovské Bohunice temporary storage of burnt fuel stores burnt fuel from the NPP V-1, NPP V – 2, and NPP Mochovce 1,2, before its transport to the re-processing plant or before its permanent storage.

Technology of processing and treatment of radioactive nuclear waste (RAW), Jaslovské Bohunice includes two bitumen lines, cement line, and the Bohunické RAW processing centre. Bitumen lines with the capacity of 120 l/h are designed to process RAW concentrates from the operation of nuclear power plants. RAW is processed into 200 litre barrels placed into fiber-concrete containers before its final storage.

National discharge site of radioactive waste Mochovce is a multi-barrier discharge site of the surface type, designed for final storage of solid and solidified RAW generated at the operation and phaseout of NPP, at research institutes, in laboratories, and in hospitals in Slovakia. As of the end of 2006, there were more than 1200 pcs of fiber-concrete containers for low to medium-active radioactive waste stored in this facility.

Nuclear facilities under construction

Construction of the centre for processing and treatment of liquid RAW from the operation of NPP blocks in Mochovce 1.2 continued in 2006. Each NPP implements a Coplex programme of minimization of RAW generation. The programme is evaluated through annual reports.

Nuclear facilities to be phased out

In 2006, NRA SR issued a permit to initiate the I. phaseout stage of the radioactive waste incinerator and bitumen line.

◆ Handling with radioactive waste

During 2006, RAW was transported from the site of its generation or storage to the individual processing technologies. More than 200 pcs of fiber-concrete containers were transported to the national discharge storage site of radioactive waste. During the year 2006, major occurrences that would lead to accidents or malfunctions did not occur at the radioactive waste handling or transport facilities.

Storage is the final step in the process of radioactive waste handling. Packaged forms of radioactive waste are permanently placed at the site of radioactive waste discharge storage. National RAW discharge storage site in Mochove stores and discharges RAW generated in Slovakia. Recent calculations show that the blocks of individual power plants will produce 2 500 t of burnt nuclear fuel and 3 700 t of radioactive waste over their projected lifetime. Current effective legislation does not allow these volumes to be placed at the National discharge storage site of radioactive waste. It is assumed that spent nuclear fuel and this type of RAW will be stored into a subterranean storage site. Its construction is currently in the engineering stage since 1996. SR also contributes to the cooperation among countries in the development of the regional subterranean storage site within the 6th framework EU programme.



Noise and vibrations

In December 2005, the Act No. 2/2005 on assessment and control of noise in the exterior and on amendment to the NR SR Act No. 272/1994 Coll. on public health protection as amended, was adopted. Acceptable noise levels are determined by the SR Government Decree no. 339/2006 Coll., which sets forth details on the acceptable noise values, infrasound values, and vibration, and on requirements for objective assessment of noise, infrasound, and vibrations.

Systematic monitoring of public noise load has not been carried out since 2006. Available are only the results from monitoring activities implemented at random sites (within investigation proceedings following public complaints, etc.).

Road transport is the major source of environmental noise in the SR. Recently, this noise source has shown a growing trend, especially due to an increasing intensity of individual road transport – the least environmentally-friendly option. Increase in this type of noise in larger cities is 40 % over the last decade. Truck transport also contributes to the overall noise load from transport.

Railway transport is also a major noise source, due mainly to the lack of up-to-date technical level and insufficient maintenance of railways located in the vicinity of residential homes, with no adequate noise-surpressing measures.

Air transport is a major source of noise load for the eastern part of Bratislava and the adjacent viallages. Situation in the cities of Košice, Trenčín, Zvolen, and Sliach is also problematic. The military airport in the district of Malacky is a significant source of noise, especially during military air trainings.

Recently, technical infrastructure components of buildings, including heating houses, cooling, air-conditioning, and pneumatic facilities, have also been among the stationary noise sources. These also include production facilities and large shopping centres.



A selected dangerous chemical substance and a selected dangerous chemical agents, use of which should be limited, can be introduced to market on condition they will not be harmful for human life and health and for the environment...

§ 28 par. 3 of the Act No. 163/2001 Coll. on Chemical Substances and Chemical Agents as subsequently amended

• CHEMICAL RISK FACTORS

Chemical substance

Centre for chemical substances and products (CCHSP), is the national authority in the area of chemicals and products. Its mission is to manage the safety of chemical substances, products and detergents, in relation to their introduction to market, as well as authorization and registration of biocidal products in accordance with the EU legislation for life and health protection, and in compliance with environmental protection principles.

MoE SR has continued in its close cooperation with the supervising authority over the chemical legislation (SR Ministry of Economy). MoE SR took on the following functions:

- implementation and transposition of the EU legislation in the area of chemicals and products into the Slovak legal system,
- development of common positions for ad-hoc meetings of the REACH taskforce group, preparation of instructions, and development of positions for various conferences on the proposed REACH management,
- development of a material for the Slovak accession to the Rotterdam convention.

In June 2006, the SR Ministry of Economy submitted to the Government a document on the approval of the Slovak accession to the **Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade** (Convention), which is a significant international legal instrument for the improvement of international regulation of trade with certain hazardous chemicals and products for the protection of plants. SR Ministry of Economy functions as the administrative authority for the selected industrial chemicals and selected products for the protection of plants. The Ministry is meanwhile the contact site for the area of

selected industrial chemicals. Ministry of agriculture is the contact site for the area of selected products for the protection of plants.

CCHSP cooperates with the Slovak Environment Agency and Regional Health Institute in Banska Bystrica in the area of **assessment of new chemicals** at the national level. CCHSP updated and revised the reports on risk assessment for two new chemicals – Dusantox L and Dusantox SPPD, adding the accompanying information by the notifier. It requested a cooperation of other responsible authorities in the member countries in the assessment of other two chemicals – Dastib 845, and Benzylpethidine Base, that were announced before May 1, 2004 in another member country. Due to the fact that the manufacturer resides in Slovakia, EC transferred on to CCHSP the responsibility for developing the documenting report, developing the risk assessment, and proposing the tests.

Pesticides

Preliminary position statement of the Slovak Republic (in August 2006) together with **preliminary positions for the meetings of the Task Force group for the area of environment** were developed and approved to accompany the EU documentation on pesticides. Space for professional discussion and clarification of opinions to the mentioned documents was created within the activities of the Specialised Commission for plant protection products and mechanisation agents. The Commission was formed under the provision of an effective Act 193/2005 Coll. on phytomedical care within the scope of the SR Ministry of Agriculture. MoE SR and its professional institutions including WRI, SHMI are also part of this commission.

Xenobiotics in the food chain

Monitoring of the occurrence of xenobiotic substances in the components of environment and the products of agricultural and food production is carried out in two ways – through a random control, and a regular monitoring.

Testing for xenobiotics is carried out by testing organisations under the valid legislation, with the goal to prevent the flow of unacceptable foods to the consumer. Results from the tests serve as the basis for adopting immediate decisions.

Monitoring of xenobiotics collects information on the status and trends in pollution of individual components of environment, as well as information on health safety of local foods. Results from the monitoring, including the risk assessment, serve as a basis for adoption of preventive measures.

♦ Monitoring of xenobiotics in the food chain

Partial monitoring system called: **Xenobiotic in foods and forage** is composed of three subsystems:

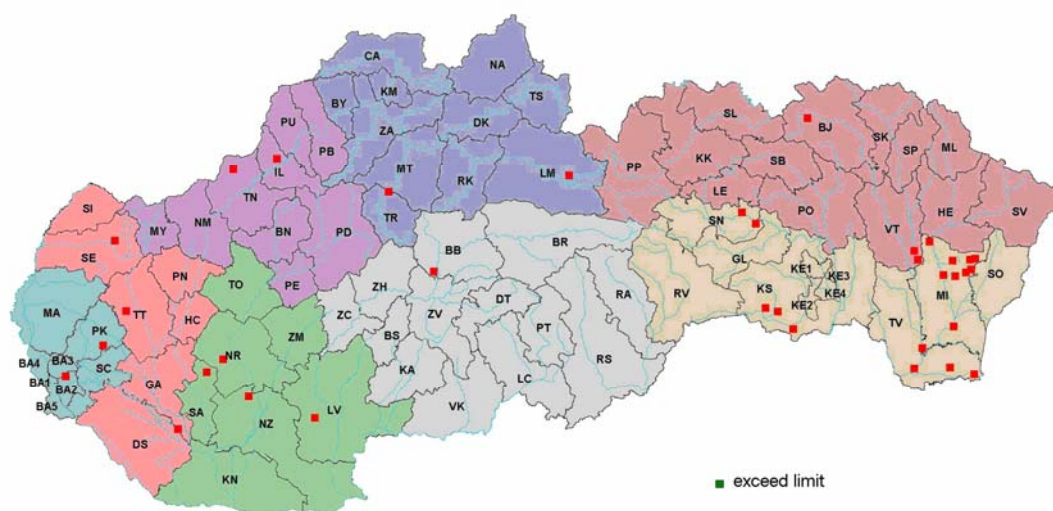
- Co-ordinated focus-specific monitoring (CFM) has been used since 1991
- Consumption pool monitoring (CPM) has been used since 1993
- Monitoring of game, wildlife, and fishes (MGF) has been implemented since 1995

Partial monitoring system has been connected to the GEMS/FOOD EURO international monitoring system since 1994.

Coordinated focus-specific monitoring (CFM) has the objective to determine actual mutual relationship between the degree of contamination of agricultural land, irrigation water, feeding water, crop and animal production, within the primary agricultural production, and obtain information on the contamination of individual food chain components.

In 2006, total number of 1 997 samples were extracted and subsequently analysed for content of chemicals, polychlorinated biphenyls (PCB), nitrates, and nitrites. Monitoring was implemented for 78 agricultural subjects in 47 districts, with analysis of the soil samples from 35 822 ha, including the crop produced from the soil.

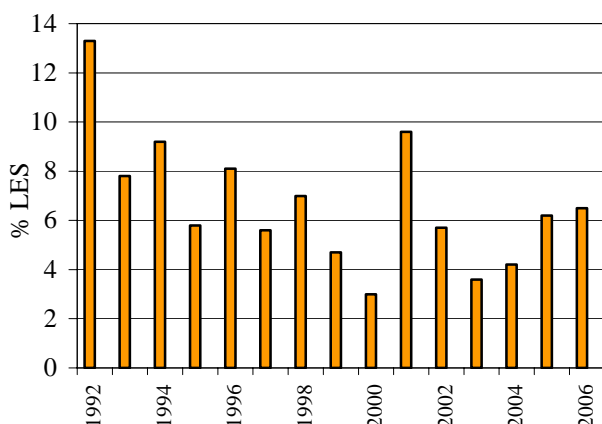
Monitored sites within the CFM with occurrence of the exceeding values of the xenobiotics in all monitored commodities in 2005



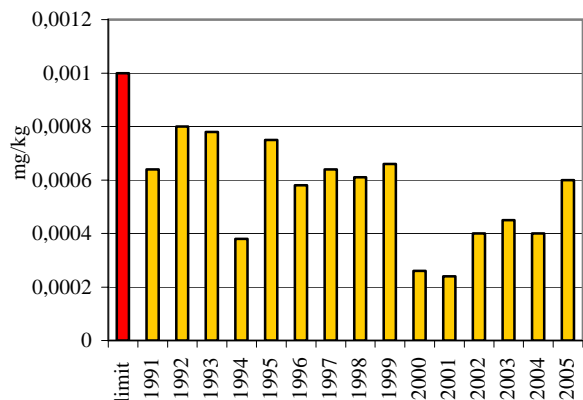
Source: SEA, FoRI SR

Of total number of extracted samples, **0.5 %** (10 samples) **did not comply** with set limit values. Unacceptable findings were recorded for the following commodities: water for animal feed (7 samples – iron, manganese, nitrates), forages from hunts (2 samples – nitrates), raw material of the animal origin (1 sample – mercury in the beef liver).

Comparison of percentage changes of the limit-exceeding samples (LES) of all xenobiotics since 1991 in all commodities together (%)



Comparison of the average findings of mercury in milk since 1991

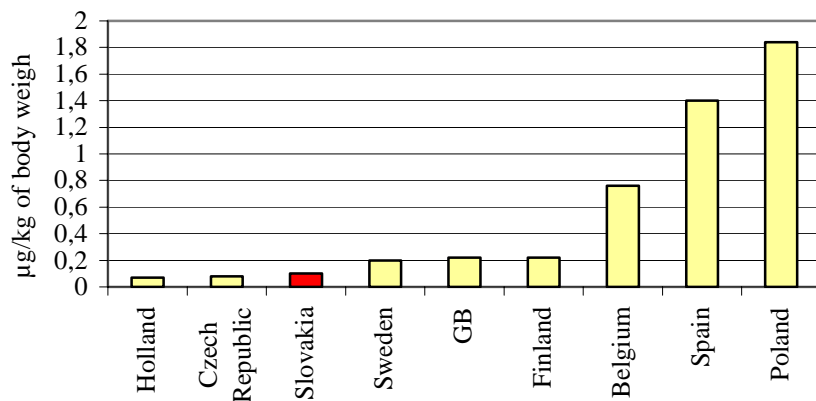


Source: FoRI

The major selected chemical contaminants include cadmium, nitrates, nitrites, and PCB.

Objective of the **Consumption pool monitoring (CPM)** is to obtain data on contamination of foods within the consumer network and subsequently assess exposition of the population to the monitored contaminants. Samples are purchased from the commercial network twice a year (May, September) at 10 Slovak sites. 27 basic food items is sampled within the consumption pool (based on statistical consumption) together with drinking water samples from public water supplies. MSK focuses primarily on determining the intake of individual xenobiotics into the human organism, in order to assess exposition of the population and compare it with the permitted tolerable weekly intake (PTWI) as well as acceptable daily intake (ADI). **In 2006**, 668 samples (20 924 analyses) were analysed, including 11 samples (1.6 %) that were unacceptable. Limit-exceeding values were recorded for the following: fruits (2 samples – pesticides), pork (1 sample – residues of antibiotics), fruit products (2 samples – pesticides), beer, malt (3 samples – nitrosamines), drinking water for the population (3 samples – PAH, mercury, lead).

Comparison of the weekly absorption of mercury by the human organism between Slovakia and other world countries



Source: FoRI

Compared with available international data, the SR may be considered among countries with **lowest values** of weekly intake of arsenic, cadmium, mercury, chrome, nickel, lead, and nitrates by the human organism.

Monitoring of game, wildlife, and fishes (Ministry of Health SR) in 2006 tested 139 samples of clove-hoofed game, hunting fish, fungi, lichens, small feather game, and water. Of 1 400 analyses, 42 exceeded the limit values. Monitoring continued with its focus on acquiring information on environmental loads, especially on the occurrence of levels of contaminants such as PCB, persistent organic pollutants, dioxins, and high-risk substances in fish caught from rivers and lakes of the east-Slovakia region.

◆ **Control of xenobiotics in food chain**

31 210 samples (230 663 analyses from domestic production) come from monitoring of xenobiotic compounds in soil, water, forage, raw material, and food of the plant and animal origin in 2005. Of these, 1 226 did not meet the valid sanitary limits for the monitored parameters. The analysis included 2 016 soil samples, inputs to soil and plant material, 9 575 water samples, 1 217 forage samples, and 18 403 food samples. Further, tested were 4 447 imported samples, 115 samples of exceptional cases, and 18 030 samples under agrochemical soil testing. Water showed the greatest number of limit-exceeding events.



While **handling waste** or otherwise treating waste everyone shall be obliged to protect human health and the environment.

§ 18 par. 1 of the Act No. 223/2001 Coll. on Waste, including several changed and subsequently amended other laws

• WASTE AND WASTE MANAGEMENT

Initial situation

Waste management in the SR entered a new phase through adopting a new **Waste Management Programme of SR for the years 2006-2010**, approved by the Government Resolution 118 of February 15, 2006.

Since 2006, it is prohibited to eliminate **biologically degradable waste** from yards and parks, including the waste from graveyards and other greenery from the lands of legal entities, natural persons, and civic associations, if part of the municipal waste. The prohibition eliminated the disposal of any “green bio-waste”, which limited its deposition on landfills, in compliance with the EC strategy.

Since January 1, 2006, the possibility to continue to keep an **old vehicle** on the basis of an affidavit was no longer applicable.

Strengthened competencies of the SEI within the **trans-boundary waste transport** include more power to carry out revisions at waste generation sites.

Balance of waste generation

Waste generation (t)

Waste category	Amount (t)
Hazardous waste	666 645
Other waste	16 598 420
Municipal waste	1 623 306
Total	18 888 371

Source: SEA, SO SR

Generation of waste located on the market (t)

Waste category	Amount (t)
Hazardous waste	535 068
Other waste	12 349 065
Municipal waste	1 623 306
Total	14 507 440

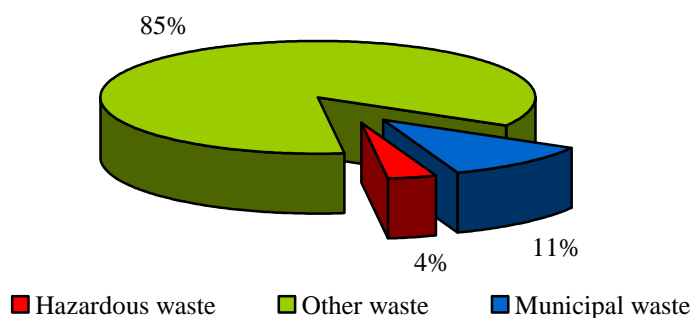
Source: SEA, SO SR

Compared to 2005, the annual increment in waste put on the market is about 33 %. **Other waste** is the greatest waste category responsible for this situation, with as much as 40 % annual increment.

The increase existed in hazardous waste generation by 5 %, compared to the previous year.

Municipal waste includes both waste categories (O and H). However, it is necessary to separate the category of municipal waste considering the unique character of its regime, typical of municipal waste.

Percentage share of waste categories on total amount of generated waste in 2006



Source: SEA

In the area of waste generation by **economic activities** classification, **manufacturing industry** has been the **dominating** component over the recent years, **with 58 %** share. Sector of transport and communications follows with 19 % (the annual increment of this sector was over 2 mil. tons of waste), building industry with 7 %, agriculture with 6 %, and trade with 4 % share. It is necessary notice that the amount of waste by particular economic sectors is not calculated municipal waste.

Waste generation by particular economic sectors in 2006 (t)

Economic sector	Total	Hazardous waste	Other waste
Agriculture	741 444.24	25 947.38	715 496.86
Fishery	519.01	0.77	518.24
Industry total	7 525 034.45	331 264.09	7 193 770.35
Building industry	916 229.95	11 152.69	905 077.26
Trade	459 151.13	40 609.55	418 541.57
Hotels and restaurants	1 689.31	157.89	1 531.42
Transport and communications	2 407 595.21	64 193.80	2 343 401.41
Banking and insurance sector	2 469.24	32.45	2 436.79
Activities in domain of real estate	115 728.59	9 126.48	106 602.11
Public administration and defence	61 079.30	414.39	60 664.91
Education	810.70	155.52	655.17
Health service	79 912.16	6 306.68	73 605.49
Waste water treatment and waste disposal	283 122.93	34 754.23	248 368.70
Unknown	289 347.12	10 952.52	278 394.60
Total	12 884 133.33	535 068.46	12 349 064.88

Source: SEA

Waste treatment

Waste treatment activities

Code	Treatment activities
R1	Used mainly as fuel or to extract energy through different approach
R2	Solvent reclamation/regeneration
R3	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes)
R4	Recycling or reclamation of metals and metal compounds.
R5	Recycling or reclamation of other inorganic material.
R6	Regeneration of acids and bases.
R7	Recovery of components used for pollution abatement
R8	Recovery of components from catalysers.
R9	Oil re-refining or other re-uses of soil.
R10	Treatment of soil to benefit the agricultural production or to improve environment.
R11	Use of waste obtained from the activities R1 to R10.
R12	Treatment of waste generated by any of the R1 to R11 activities.
R13	Storing of waste before using any of the R1 to R12 activities (besides temporary storage prior to collection at the place of waste generation).

Waste disposal activities

Code	Disposal activity
D1	Underground or surface waste disposal. (e.g. landfill)
D2	Treatment by soil processes (e.g. biodegradation of liquid or sludge waste in soil, etc.)
D3	Depth injection (e.g. injection of extractable waste into wells, salt mines or natural disposal sites, etc.)
D4	Disposal into surface tanks (e.g. disposal of liquid or sludge waste into pits, ponds, or lagoons, etc.)
D5	Specially engineered landfills (e.g. placement into separate cells with treated wall surfaces that are covered and insulated one from another and from environment, etc.)
D6	Discharging and dumping into water recipients, besides seas and oceans.
D7	Discharging and dumping into seas and oceans, including disposal to ocean bottom.
D8	Biological treatment non-specified in this annex that generates compounds and mixtures eliminated by any of the D1 to D12 activities.
D9	Physical-chemical treatment non-specified in this annex that generates compounds and mixtures eliminated by any of the D1 to D12 activities. (e.g. vaporizing, drying, calcinations, e.g.)
D10	Incineration on land.
D11	Incineration at sea.
D12	Permanent storage (e.g. placing of containers in mines, etc.)
D13	Mixing or blending prior to any of the D1 to D12 activities.
D14	Placing into other packaging prior to any of the D1 to D12 activities.
D15	Storage before implementing any of the D1 to D14 activities (besides temporary storage prior to collection at the place of waste generation).

Waste disposing

Handling with waste by means DO, O and Z codes (t)

Disposal code	Activity	Total	Hazardous	Others
DO	Handing over of waste for domestic use	107 300.58	99.98	107 200.60
O	Handing over to another subject	803 052.79	40 821.45	762 231.34
Z	Storage of waste	162 523.91	5 104.11	157 419.80
Total		1 072 877.28	46 025.54	1 026 851.74

Source: SEA

Waste recovery

There were **5 625 984 tons of waste recovered** in the SR in 2006. This represents **39 % of total volume of waste** located on the market. Despite the fact that great volumes of reclaimed waste grew almost by 1 mil. tons since 2005, volume of reclaimed waste in terms of its share on total waste generation dropped by 5 %. R5 activity – Recycling or re-extraction of other inorganic compounds has the greatest share on waste reclamation (45 %). R3 activities – Recycling or re-extraction of organic compounds that are not used as solvents (including composting and other biological transformation processes) show a 16 % share, R10 activities – treatment of soil for the purposes of agricultural returns or for improving the environment show a 14 % share, and R4 – recycling or re-extraction of metals and metallic compounds shows an 11 % share.

Waste recovery following codes R1 – R13 in year 2005 (t)

Code of recovery	Total	Hazardous waste	Other waste
R01	265 351.95	8 764.83	256 587.12
R02	5 547.53	5 395.81	151.72
R03	886 766.05	24 529.49	862 236.57
R04	599 862.59	11 819.57	588 043.02
R05	2 545 692.55	49 127.83	2 496 564.72
R06	849.63	849.07	0.56
R07	104.97	53.96	51.01
R08	171.42	164.70	6.72
R09	12 118.44	11 593.93	524.51
R10	800 771.22	12 638.78	788 132.44
R11	161 819.86	837.06	160 982.80
R12	46 360.34	2 920.61	43 439.73
R13	300 567.74	10 638.68	289 929.06
Total	5 625 984.30	139 334.32	5 486 649.98

Source: SEA

Waste disposal

Of total volumes of generated waste, **43 % of waste was disposed**, which in absolute numbers means **6 185 272 tons of waste**. Dominance of landfill waste is a historical rule, with a 91 % share on total waste disposal. Compared to 2005, volumes of waste disposed of at landfills doubled. This suggests that the year 2005 with its low volumes of waste disposed of at landfills was rather an exception. As of December 31, 2006, there were 160 landfills operated in Slovakia.

Number of landfills (towards 31.12.2006)

Region	Hazardous waste landfills	Landfills for not hazardous waste	Inert waste landfills	Total
Bratislavsky	2	6	2	10
Trnavsky	2	17	1	20
Trenčiansky	1	14	3	18
Nitriansky	3	19	2	24
Žilinsky	1	16	3	20
Banskobystricky	1	21	3	25
Prešovsky	1	22	1	24
Košický	3	13	3	19
Total	14	128	18	160

Source: SEA

Waste disposal following codes D1 – D15 in year 2005 (t)

Code of disposal	Total	Hazardous waste	Others waste
D01	5 646 390.70	111 250.10	5 535 140.61
D02	197 516.02	82 841.66	114 674.36
D03	13.11	0.03	13.08
D05	421.10	253.54	167.56
D08	108 299.27	26 210.01	82 089.27
D09	77 215.46	62 403.40	14 812.06
D10	98 850.98	49 146.53	49 704.45
D11	8.42	0.13	8.30
D12	24.14	0.67	23.47
D13	5 730.26	77.09	5 653.18
D14	833.75	309.02	524.73
D15	49 968.54	17 216.42	32 752.12
Total	6 185 271.76	349 708.59	5 835 563.16

Source: SEA

The important share of waste disposal, with 3 %, has D2 method, following D8 method, biological treatment which is generated wastes disposed by methods marked as D1 to D12 and method D10 – incineration on land contributes by 2 %.

Waste from electrical and electronic equipment (WEEE)

The year 2006 was the first complete year that brought practical information on the system of handling electrical appliances and electric waste. Producers of electrical appliances are obliged to meet the limits for 10 categories of waste collection, reclamation or recycling, as well as re-use the electric waste.

To ensure that these obligations are met, producers gathered together to form collective systems.

Collective systems in SR in 2006

Collective system	Category
ENVIDOM – Association of producers of electrical appliances for recycling	Categories 1 and 2
SEWA, Inc.	All categories
EKOLAMP Slovakia – Association of producers and distributors of lighting equipment	Category 5
ETALUX – Association of producers and suppliers of lighting equipment	Category 5
ENVI-GEOS Nitra, Ltd.	All categories
ENZO-VERONIKA-VES, Inc.	All categories
ELEKTRORECYKLING Ltd.	All categories
Brantner Slovakia, Ltd.	All categories
ZEO, Ltd.	Category 6
LOGOS Slovakia, Ltd.	All categories

Summary reports by producers of electrical equipment for the year 2006

Category under Annex 3 of the waste law	Introduced to market (kg)	Collected (kg)	Processed (kg)	Recovered (kg)	Recycled (kg)
1. Big domestic appliances	26 965 492.83	4 880 656.00	4 880 656.00	4 413 900.41	4 333 319.55
2. Small domestic appliances	3 889 013.05	477 121.00	477 121.00	394 162.31	331 776.44
3. IT and telecommunication devices	5 723 479.60	857 904.00	857 284.00	761 010.04	637 314.59
4. Consumer electronic devices	6 794 705.05	1 800 214.00	1 800 214.00	1 526 073.65	1 401 654.40
5. Sources of light	3 278 331.13	95 050.00	95 170.90	76 879.27	66 149.23
5a. Gass lamps	493 320.12	144 514.00	137 380.00	120 415.52	120 415.52
6. Electrical and electronic instruments	3 376 681.78	80 428.00	80 428.00	63 813.63	54 299.79
7. Toys, devices designated for sport and recreational use	519 638.76	2 650.00	2 644.00	2 403.69	2 165.44
8. Medical devices	67 960.29	30 778.00	31 438.00	27 017.30	25 716.91
9. Machines for monitoring and testing	53 789.02	33 993.30	33 993.30	29 799.77	28 130.54
10. Vending machines	180 074.00	180 119.00	180 844.00	163 067.03	158 350.00
	51 342 485.63	8 583 427.30	8 577 173.20	7 578 542.62	7 159 292.41

Source: SEA

There were placed on the market 51 thousand tons of electrical devices in Slovakia in 2005 (10.4 kg per inhabitant). Amount of collected WEEE was approx. 8.3 thousand tons (1.6 kg per inhabitant).

Old vehicle

There were 723 old vehicles processed in 2004, 3 922 in 2005 and 19 446 in 2006. In 2008 were operated 18 authorised facilities of old vehicle treatment.

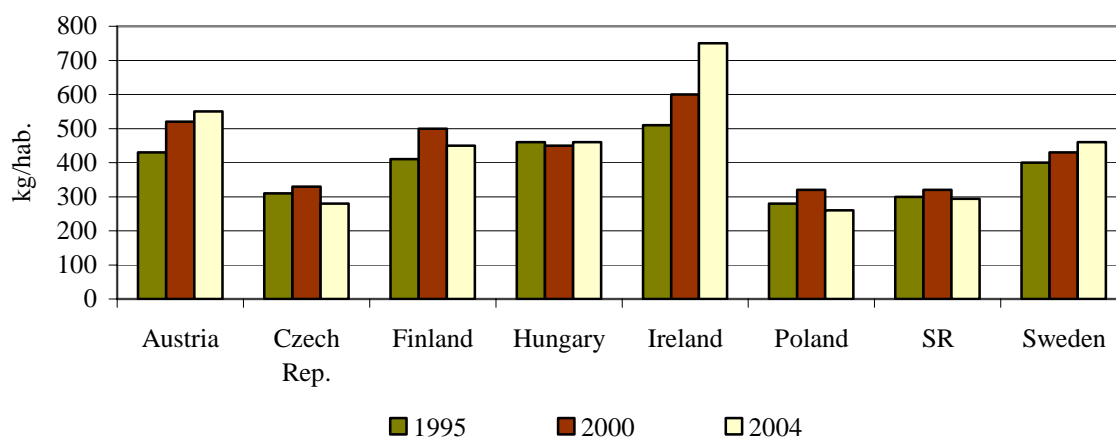
Municipal waste

According to data from the SO SR, there were **1 623 306 tons of total municipal waste** generated in Slovakia in 2006. This volume represents **301 kg of municipal waste per capita**. Compared to 2004, this is an increase by 12 kg per capita. Long-term waste **disposal on landfills** (78 %) is the **most frequent method** of municipal waste handling, following by incineration (5 %) and composting by 3 %.

In terms of **municipal waste composition**, mixed municipal waste (71 %) constitutes the major component of municipal waste together with bulky waste (9 %), small construction waste (6 %). Biologically degradable waste was 5 % and waste from street cleaning was 3 %.

According to the SO SR, **volume of separated municipal waste per capita is 16 kg**, which means that the level of municipal waste separation is the same as in 2005. Volume of **recovered municipal waste per capita increased by 15 kg**.

Municipal waste generation – international comparison (kg/habitant)



Source: OECD

Municipal waste generation and disposal (t)

Region	Total	D01	D02	D05	D07	D08	D09	D10	D11	D13	D14	D15	DO	O
Bratislava	249 456.45	95 083.94						128 433.80	240.00					2 964.71
Trnava	239 358.39	216 620.43		1 173.79				2.00						9 569.78
Trenčín	176 419.49	157 681.37	1.50	0.10	20.00	10.00	2.79	0.01		5.72	1.00	3.24		7 699.45
Nitra	224 442.79	203 412.74		891.26								0.83	34.00	8 077.52
Žilina	205 626.68	191 593.24											1.00	7 889.95
Banská Bystrica	163 116.80	146 391.05												14 423.18
Prešov	184 382.79	145 988.35		344.85			4.65	100.79				761.82		19 022.01
Košice	180 503.09	102 842.01						61 217.78				1 304.10		12 226.37
Total	1 623 306.48	1 259 613.13	1.50	2 410.00	20.00	10.00	7.44	189 754.38	240.00	5.72	1.00	2 069.99	35.00	81 872.97

Region	R01	R02	R03	R04	R05	R0	R0	R8	R09	R10	R11	R12	R13	Z
Bratislava	13.00		6 920.73	1 186.14	570.85					16.00	2.70		14 024.58	
Trnava	15.00	0.09	9 021.59	103.10	717.14		0.50		0.13		4.30	11.52	117.96	2 001.06
Trenčín	18.09		5 583.29	247.56	1 271.43	2.97		4.50	9.99	3.30	234.89	3.18	3 190.86	424.25
Nitra			7 817.63	53.38	1 126.23				10.92	210.10	11.56	1 279.55	260.55	1 256.52
Žilina	5.75		4 807.72	304.98	540.16									483.88
Banská Bystrica	144.03		1 056.18	77.96	711.85								3.62	308.93
Prešov	29.12		16 011.32	258.86	823.57				0.33	19.40	0.55	0.66	938.11	78.40
Košice	12.40		362.28	158.26	1 084.57				0.02			74.35	1 064.20	156.75
Total	237.39	0.09	51 580.74	2 390.24	6 845.80	2.97	0.50	4.50	21.39	248.80	254.00	1 369.26	19 599.88	4 709.79

Source: SO SR

Financial mechanisms of waste management

◆ Recycling fund

The recycling fund completed its five-year existence in 2006.

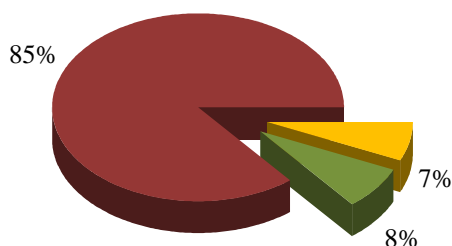
In 2006, the Fund gathered from the importers of ten charged commodities almost 565 million SKK. Fund revenues from contributions were not even 65 % of the 2002 revenues. Compared to the previous year, revenues were lower by 80 million SKK.

The fund paid almost 17 million SKK to more than 1 500 applications for contribution for separated waste, submitted by municipalities. The Waste Act recognizes the right of the municipalities to be paid a contribution of 1 300 to 1 800 SKK per ton of waste sent to be reclaimed.

◆ Environmental Fund

In 2006, the Environmental Fund for waste management received 187 applications for total volume of 490 mil. SKK in subsidies. Of the total number of 187 applications in the area of waste management, 86 applicants were funded, with the amount of 137 mil. SKK.

Proportion of granted financial support from the Environment Fund in 2006 by supported activities



Separated collection of waste introduction and construction of collection yards
 Separation and reclamation of bio-waste
 Demolition and reclamation of abandoned landfills

◆ Structural EU Funds

In recent years, structural EU Funds within the Basic Infrastructure Operation programme provided significant amount of funding for the development of waste management infrastructure. During the programme period of 2004-2006, 56 applications were approved as of June 15, 2007, amounting to 786 mil. SKK on non-repayable contributions. The State budget contributed with more than 367 mil. SKK, which amounts to 1 152 mil. SKK of total funding. The applicants participated with the total sum of 334 mil. SKK, including the public sector's contribution to projects at 5 %, which represents 35 mil. SKK, and the private sector contributing with the sum of 298 mil. SKK. Total amount of released funding is 1 487 mil. SKK. Projects that were approved and for which are 21 projects in the depository.

Released funding by type of supported activity for the years 2004-2006

Activity	Total funding
Support of activities relating to separated collection of waste	95 637 702 SKK
Support of waste reclamation activities	786 197 562 SKK
Shutdown and reclamation of landfills	604 682 451 SKK

Source: MoE SR

Packaging and waste from packaging

Volumes of packaging waste generated in the SR and recovered or incinerated in waste incinerators with energy recovery technologies (t)

Material	Packaging waste	Recovered waste or waste incinerated with energy recovery			
		Material recycling	Recycling total	Waste incineration with energy recovery	Waste and energy recovery and waste incineration in total
Glass	99 901	50 052	50 052	-	50 052
Plastics	90 205	16 290	16 290	10 644	26 934
Paper/cardboard	124 100	24 987	24 987	31 818	56 805
Metals	Aluminium	3 076	628	628	-
	Steel	13 579	6 161	6 161	-
	Total	16 655	6 789	6 789	6 789
Wood	15 839	5 154	5 154	5 497	10 651
Total	346 700	103 272	103 272	47 959	151 231

Source: MoE SR

Trans-boundary movement – import, export and transit of waste

For its licensing of transport waste over national borders in 2006, the MoE SR followed the EEC Council Regulation 259/1993 on the supervision and control of shipments of waste within, into and out of the European Community (Council Directive 259/93) taking into account the Treaty of Accession of the SR to the EU, and the relevant national legislation in the area of waste management. In compliance with the Treaty of Accession of Slovakia to the EU, also the import of waste under Annex II of the Directive (Green list waste) was allowed.

Over the period of 1.1.2006 to 31.12.2006, the MoE SR issued **194 decisions on trans-boundary transport of waste**, including **144 import licenses** (in total **748 330 tons** of waste), **36 export licenses** (in total **208 690 tons** of waste), **14 licenses for transit transport of waste** (in total **47 342 tons** of waste).

Summary of the number of effective licenses for trans-boundary transport of waste, issued in 2006

Issued in year	Import	Export	Transit	Total
2006	51	9	5	65
>2006	93	27	9	129
Total	144	36	14	194

Source: SEA

◆ Waste import

Of total number of 144 licences regarding the import of waste for recovery, **5 licences** were issued to allow the **import of hazardous waste** at total volume of **2 390 tons**. 14 licences were issued to import waste for energy extraction (through R1 activity) at total volume of 146 400 tons. The waste was imported from Austria, Hungary, Germany, and Czech Republic. 130 licences were issued to import waste for reclamation of material at total volume of 601 930 tons.

Licences issued in 2006 allowed waste import from 11 countries. Import from 8 countries made up 97.9 % of total permitted imported volumes.

◆ Waste export

Of total number of 36 licences regarding the export of waste for reclamation, 16 licences were issued to allow the export of hazardous waste at total volume of 9 899.5 tons.

Licences to export waste in 2006 involved 14 categories of waste, with 6 waste categories classified as the green list waste. In the area of permitted volumes for export, most exported waste included the green list waste (Annex II of the Directive), which was 94.7 %.

Total permitted volumes of waste by individual countries

Country/ISO code	Import to SR (t)	Export from SR (t)
Belgium	-	7 200
Belorussia	240	-
Czech republic	139 480	2 040.5
Netherlands	250	-
Hungary	204 600	200
Poland	170 400	116 400
Austria	173 070	600
Romania	5 000	-
Germany	39 540	189
Switzerland	500	-
Ukraine	15 050	82 000
Great Britain	200	60
Total	748 330	208 689.5

Source: SEA

◆ Waste transit

MoE SR decisions for transit transport issued in 2006 made it possible to transport 7 waste categories in total waste amount of 47 342 tons of waste.

Decisions of the MoE SR for transit of waste in 2006 allowed transport through the SR territory from the Federal Republic of Germany (30 792 t), Hungary (6 500 t), and Romania (1 020 t) and from Serbia and Monte Negro (6 000 t) to the facilities located in the destination countries.



Fire is every undesirable burning, by which damages of property or environment emerge, or which results in death or injured person or killed animal; fire is also undesirable burning, which endangers lives or health of people, animals, property or environment.

§ 2 par. 1 letter a/ of the Act No. 314/2001 Coll. on Prevention from Fires

• NATURAL AND TECHNOLOGICAL HAZARDS

Accidental deterioration of water quality

In 2006, there was an increased number of occurrences that deteriorated the quality of surface and ground water. SEI alone registered 151 of emergency deteriorations or threats to water quality (EDW).

Special declination or quality menace of water of the SR in the years 1993-2006

Year	EDW recorded by SEI	Special deterioration of water					
		Surface			Ground		
		Total number	Watercourses and basins	Water courses	Total number	Pollution	Endangerment
1993	142	95	3	12	47	10	37
1994	121	82	5	7	39	10	29
1995	129	73	5	11	56	8	48
1996	117	71	1	10	46	7	39
1997	109	63	0	6	46	14	32
1998	117	66	2	1	51	10	41
1999	98	61	2	9	37	3	34
2000	82	55	2	9	27	3	24
2001	71	46	1	4	25	1	24
2002	127	87	1	6	40	5	35
2003	176	134	2	3	42	0	42
2004	137	89	1	10	48	11	37
2005	119	66	2	5	53	2	51
2006	151	94	0	3	57	6	51

Source: SEI

In 2006 again, in terms of hazardous compounds (HC), deterioration of water quality was caused mainly by crude oil compounds in 69 cases (45.7 %), waste water in 28 cases (18.5 %), and in 22 cases (14.6 %) no contaminant was detected. Livestock excrements in 14 cases (9.3 %), insoluble substances, caustic alkali, pesticides, and other toxic substances have smaller impact on EDW.

Progress in number of EDW according to the sort of HC in the years 1994-2006

Sorts of water deteriorative substances	1994	1996	1998	1999	2000	2001	2002	2003	2004	2005	2006
Oil substances	63	69	61	54	33	40	64	59	70	63	69
Alkalis	3	5	3	5	2	2	5	3	1	0	3
Pesticides	1	1	3	1	0	0	1	0	3	0	2
Excrements of farm animals	9	14	3	7	5	4	9	21	15	14	14
Silage fluids	0	1	0	2	4	0	2	1	1	0	0
Industrial fertilisers	0	0	0	0	0	0	0	1	0	0	0
Other toxic substances	5	1	0	6	12	5	3	3	0	4	4
Insoluble substances	4	4	7	1	5	2	6	11	3	4	3
Waste water	6	6	17	6	10	10	17	35	20	10	28
Other substances	13	9	6	4	2	1	3	7	10	8	6
Water detrimental substances impossible to determine	17	7	17	12	9	7	17	35	14	10	22

Source: SEI

In 2006, there was 1 EDW outside the Slovak territory, in Austria. Foreign nationals caused 13 EDW in Slovakia. Two EDW were caused by ship transport. Other EDW were caused by vehicle transport subjects.

Just like in the previous years, in 2006, human factor and poor technical condition of equipment or facilities for hazardous substances were the most frequent causes for EDW. High number of EDW was caused by transport (38) and transfer of hazardous substances (6).

Accidental deterioration of air quality

In 2006, Air Protection Inspectorate Division of SEI, recorded eight events that caused deterioration in air quality. Causes for EDW included insufficient tightness on supply pipes (2), extremely low ambient air temperature (2), malfunction of electro-engine of the suction devise, fire, and faulty manipulation at HCL compaction. Only one incident is still under investigation.

Fire risk

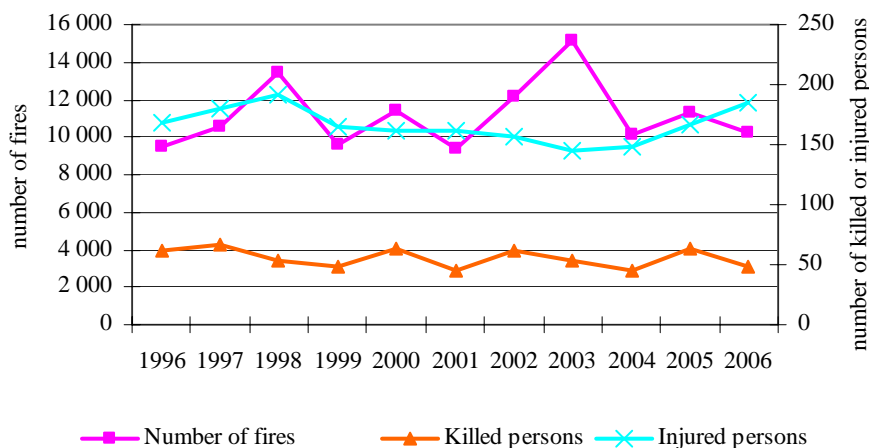
In 2006 were documented in the SR **10 260** fires, causing 49 casualties and 185 injured. Direct material damage reached 817 053.5 thous. SKK, while the volume of preserved values was calculated at 3 231 641 thous. SKK.

Compared to previous years, greatest number of fires originated surprisingly in the **household sector** – 1 830, with direct material damage amounting to approximately 134 713 400 SKK. In total, they resulted in 38 deadly casualties and 120 injured people. In terms of fire statistics, **agriculture** shows the second greatest



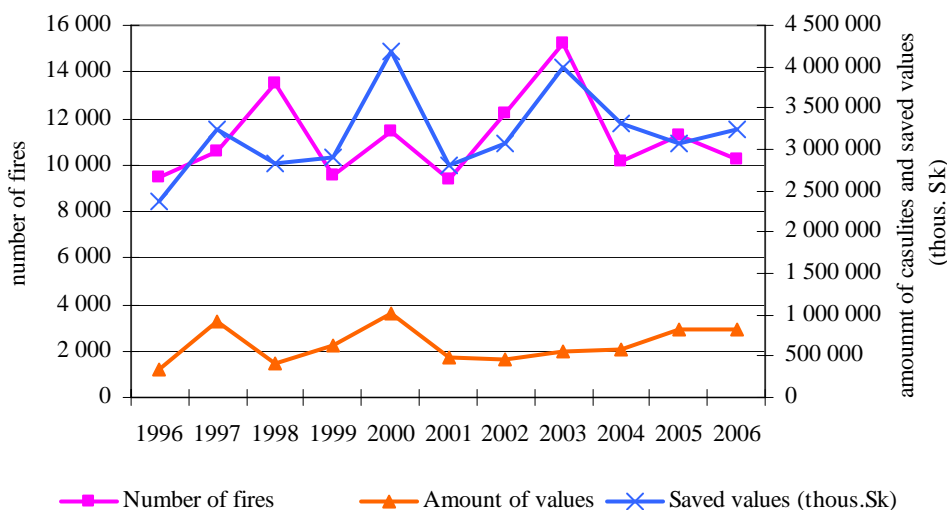
number of fires – 1 552, occasioning direct material damage at 47 100 200 SKK, killing 2 persons, and injuring 3. Least number of fires was recorded in the **commercial** sector, with 138 direct material damage events, totalling 91 011 900 SKK. Overall situation in fires in Slovakia in 2006 shows **lower** numbers **by 1 034**, compared to 2005. Material damage; however, was **greater by 3 558 600 SKK**.

Relationship between number of fires and number of killed or injured persons in 1995-2006



Source: FPRS MoI SR

Relationship between number of fires and number of casualties or amount of saved values in 1995-2006



Source: FPRS MoI SR

Floods

In 2006, there were 512 municipalities affected by floods. 11 420 inhabitants felt the aftermath of the floods, including 915 persons who had to be evacuated. 75 inhabitants temporarily lost their houses. 97 persons were rescued by rescue activities, 1 person died.

Total cost and damages by floods in the SR in 2006 amounted to 2 799.644 thous. SKK, including the rescue costs of 180.348 mil. SKK, and safety works of 193 398 thous. SKK.

Material damage amounted to 1 442 988 thous. SKK, including the damage to the State property at 236 550 thous. SKK, and damage to private citizens' property was 123 203 thous. SKK, and damage to municipal property was 324 506 thous. SKK, damage to higher territorial governing units was 250 990 thous. SKK, and damage to other subjects was 507 739 thous. SKK. Flood prevention construction measures at water courses were damaged, resulting in damages at 982 910 thous. SKK.

Floods aftermath over the period of 1999-2006

Year	Number of flood stricken residential areas	Flooded Territories (ha)	Damages by floods (mil. SKK)	Costs (mil. SKK)		Total costs and damages (mil. SKK)
				Rescue activities	Maintenance and safety activities	
1999	682	181 433	4 460.90	58.30	65.10	4 584.30
2001	379	22 993	1 960.60	57.10	32.10	2 049.80
2002	156	8 678	1 525.70	58.10	50.10	1 639.90*
2003	41	744	43.90	5.69	4.20	53.79
2004	333	13 717	1 051.80	37.23	102.93	1 191.96
2005	237	9 237	800.46	67.82	80.64	948.92
2006	512	30 730	2 425.90	180.35	193.4	2 799.64

* including also the sum of 6.0 mil. SKK – cost of anti-mosquito chemical spray treatment

Source: MoA SR, MoE SR