MINISTRY OF THE ENVIRONMENT OF THE SLOVAK REPUBLIC

STATE OF THE ENVIRONMENT REPORT

SLOVAK REPUBLIC 2007

Ministry of the Environment
of the Slovak Republic

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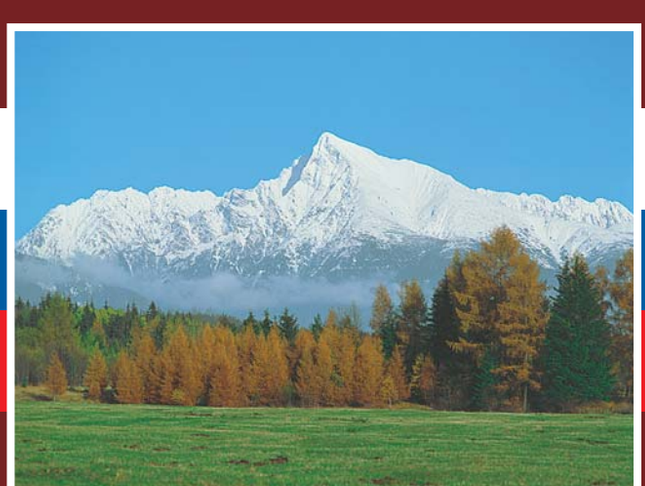


Slovak Environmental Agency

j. Klinda

FOREWORD

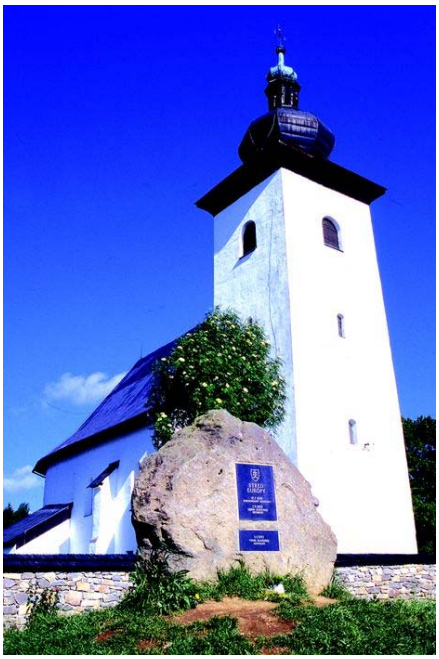
Every year, since 1993, the Ministry of Environment of the Slovak Republic has published **State of the Environment Report in the Slovak Republic.** In this, the Ministry not only undertakes to meet its obligation pursuant to Act 17/1992 Coll. on environment and Act 205/2004 Coll. on gathering, storing, and spreading of environment-related information, but actively contributes to raising the environmental awareness and knowledge base of the Slovak public.

State of the Environment Report in the Slovak Republic in 2007 is the **fifteenth report** of its kind, published annually since the mentioned year of 1993. Its objective over the recent years has been to offer a summary on the actual state of the components of environment – air, water, soil, rocks, biota, as well as to assess the existing situation in the protection of nature and landscape, and describe what factors and in what way impact the environment. The document, at the same time, supplies new information on specific steps in the area of environmental protection - be it environmental impact assessment, integrated prevention and control of pollution, prevention of major industrial accidents, as well as funding environmental solutions through selected economic instruments, EU-funded projects, and projects implemented through international cooperation from other sources, especially the Environmental fund.

Slovak Republic as full member of the **European Union** is obliged to fully accommodate and subsequently implement the legislation effective for individual EU member countries. Number of newly-adopted legislation is gradually decreasing, while the emphasis is placed mainly on the steps leading to the implementation of environmental legislation in its complexity.

Besides carrying out the obligations of the Slovak Republic toward the European Union, the Slovak Government in its **programme declaration** considers environmental care and protection to be a decisive instrument in securing sustainable development.

There are many tasks yet to be addressed. Among others, let me mention introduction of municipal sewerage systems and waste water treatment, compliance with air-quality pollution limits, reaching the



objectives of waste management, and meeting the obligations related to the NATURA 2000 network creation. These tasks, being financially demanding especially, belong to the priorities of our country. Their implementation calls for a coordinated and systematic effort, since sufficient funds is only one of the conditions to carry out such endeavours. At the same time, they need a sufficient professional potential, coordination of tasks, and last but not least, a considerable enthusiasm of people occupying different positions – among them top management institutions, professional institutions, upper-tier government units, municipalities, businesses, and finally each of us – the people of the this country, who through their actions and attitudes can impact our living environment.

The submitted State of the Environment Report has been created on the basis of a **wide and long positively acclaimed cooperation** between specialists of environmental institutions and other cooperating organisations. The Report is a fruitage of a whole array of activities carried out within the environmental monitoring system, statistical observations, analyses and evaluations, all of them funded with considerable amount of funds from the government budget.

As mentioned above, from the perspective of long-term **environmental assessment**, the changes are no longer as dramatic as those taking place in the last years of the 20th century.

Positive outcomes resulting from the trend in environment include permanent and slight reduction in basic pollutant emissions. Notwithstanding all this, it has not been possible to comply with the pollution limits at all air quality monitoring stations. The **problem** is particulate matter PM_{10} air pollution, which significantly exceeds the limits of air pollution generally valid as of January 2005. Adverse situation has remained in ground ozone air pollution with exceeded limit values for human health protection and vegetation. On the other hand, there has been a continuing trend in reduction of aggregated anthropogenic emissions of green house gasses. However; just like in case of particulate matter emissions, these changes in total volumes since 2000 have been minimal. Air quality represents a complex issue. Therefore, we must address not only the issue of stationary sources, but also mobile and spatial sources, minimise adverse climate changes that are closely related with air quality, and support renewable energy sources, etc.

I already mentioned the demanding obligations in the area of sewerage and waste **water** treatment installations. Despite the growing share of inhabitants connected to sewerage and waste water treatment plants, this area remains to be one of the most challenging areas in relation to the obligations set forth by the Council Directive 91/271/EEC concerning urban waste water treatment, which prescribes necessary level of treatment before discharge, and which must be implement in the EU-10 countries between the years 2008-2015. The Directive also requires all member countries to provide collection systems and

adequate treatment for all collected waste water in all agglomerations of more than 2000 inhabitants' equivalents. Framework directive on water sets out demanding objectives for us – to reach good water balance by 2015. Surface water quality monitoring has been carried out in compliance with the Water situation monitoring programme in 2007. The obtained results allow me here to say that, just like in the case of air protection, there are indicators whose compliance pose no problems for Slovakia; however, there are also indicators that exceed the set limit values and we will have to tackle the problem of reducing the contamination also on the basis implementation of planned planning and programme documentation including mainly the Slovakia Water Plan along with watershed management plans.

The year 2007 has been the second consecutive year of implementation of the Waste management programme in the SR for the years 2006-2010. This document that shows obligations toward the EU also spells out ambitious goals in terms of **waste** handling. Total reduction in generated waste is a positive thing; however, in terms of individual waste handling approaches, high volume of waste stored on landfills and low volumes of separated waste calculated per single Slovak inhabitant remain problematic.

I would like to further accentuate the endeavours in the area of nature and landscape protection as related to the NATURA 2000 network creation. This network represents a continuous ecological network of especially protected territories in a special EU interest and which are built by the member countries independently of their national systems of protected areas. Despite the fact that a number of activities have been carried out in this area, there are more that still are ahead of us.

Let me mention also the issue of implementation of voluntary instruments that are contrary to commands and imperatives, and which implementation also significantly and positively impacts the environment. Specifically, this includes a system of assessment and labelling of environmentally friendly products, implementation of the EMS and EMAS schemes, green public procurement, etc.

Following up on the high financial demand of tasks in the area of environmental protection, it is necessary to comply with the condition of targeting and proper use of financial means designated to receive assistance from the European Union for the area of environment for the years 2007-2013 as mentioned in the pertinent SR programme document - Operational program of Environment. Implementation of supported activities should be directly reflected in the assessment of individual environmental indicators and subsequently in documents showing the improving quality of environment in Slovakia.

To conclude, let me express my and the authors' sincere hopes that this State of the Environment Report of the Slovak Republic in 2007 becomes a useful source of valuable information and at the same

time serves as an impetus to increase the interest of all in the sensitive issue of environmental protection that represents one of the important factors impacting the human health. Meanwhile, we welcome any comments and suggestions that will eventually contribute to a higher quality of the document and which will meet the universal right to information on the state of the environment.

Ing. Ján Chrbet

Minister of the Environment
of the Slovak Republic

*Everybody has the right to get prompt and thorough **information on the condition of the environment** and on the reasons and consequences of this condition.*

Article 45 of the Constitution of the Slovak Republic

COMPLEX ENVIRONMENTAL MONITORING AND INFORMATION SYSTEM

• LEGAL OUTCOMES AND CONCEPTS

Environmental monitoring and information technology are built pursuant to Act No. 261/1995 Coll. on state information technology system, concept of the information system of the ministry and in the year 2000 on the resolution of the Slovak government No. 7/2000 on approved concepts of completion of the complex environmental monitoring information system. The goal is to ensure and make available environmental information on the state of environment and involve the public in decision-making processes. This is in line with Act No. 205/2004 Coll. on gathering, maintaining and disseminating information on environment.

• ENVIRONMENTAL MONITORING SYSTEM

The System of environmental monitoring is an indispensable tool to know the environment and ensure environmental care. The System contains partial monitoring systems (PMS) installed at selected centres. The Information monitoring system (IMS, www.enviroportal.sk/ism) with the goal to create a homogeneous, interconnected information unit consisting of partial IMSs. The unit is able to provide most objective report on the actual state of components of environment and due to interconnected databases is generally accessible through the Internet.

PMS	Guarantor	Centre	Monitored subsystem	
Air quality	MoE SR	Slovak Hydro Meteorological Institute	Level of pollution Ground atmospheric level – air above the whole Slovak territory is divided into 2 agglomerations and 8 zones.	
Meteorology and climatology	MoE SR	Slovak Hydro Meteorological Institute	Network of ground synoptic and air stations Network of meteorological radars Meteorological satellite measurements Network of stations with climatology observation programme Network of precipitation measuring stations Network of stations measuring solar radiation and total atmospheric ozone	Network of phenological stations Network of measuring soil temperature and soil humidity Network of measuring in the ground atmospheric level Aerologic station Storm detection station network
Water	MoE SR	Slovak Hydro Meteorological Institute	Surface water quantitative indicators Groundwater quantitative indicators Surface water quality Groundwater quality	Thermal and mineral water Irrigation water Recreational water bodies
Radioactivity	MoE SR	Slovak Hydro Meteorological Institute	Environmental radioactivity - Ground atmospheric level at monitoring sites	
Waste	MoE SR	Slovak Environmental Agency Banská Bystrica	Waste generation and disposal in Slovak Republic Waste reclamation facilities	Waste reclamation facilities Interstate transport of hazardous waste
Biota	MoE SR	SR State Nature Conservancy Banská Bystrica	Fauna Flora	
Geological factors	MoE SR	State Geological Institute of Dionýz Štúr in Bratislava	Landslides and other slope deformities Erosion processes Monitoring of erosion processes Soils of unstable volume Effect of mineral exploitation on environment Change to anthropogenic sediments Stability of rock massifs below historic objects	Anthropogenic sediments buried Tectonic seismic activity of territory Monitoring of snow cap chemical composition Monitoring of seismic phenomena Active alluvial sediments Volume activity of Radon in geological layers
Soil	MoA SR	Soil Science and Conservation Research Institute in Bratislava	Basic network Key locations Special network of sites	Spatial monitoring of agricultural lands Forest land monitoring
Forests	MoA SR	National Forest Centre in Zvolen	Extensive periodical monitoring - 112 permanent monitoring areas Intensive periodical and continuous monitoring – 7 permanent monitoring areas	
Xenobiotic substances	MoA SR	Food Research Institute in Bratislava	Coordinated focal monitoring Consumption pool monitoring	Monitoring of game and fish

Source: MoE SR

Funds invested in environmental monitoring (thous. SKK)

PMS	Year					
	2002	2003	2004	2005	2006	2007
Air quality	28 651	27 600	18 400	16 900	28 971	57 748
Meteorology and climatology	28 300	33 200	35 000	26 031	76 013	29 609
Water	44 434	35 330	24 192	43 717	**44 447**	100 440
Radioactivity	2 668	1 792	1 454	1 500	**2 545**	2 301
Waste	3 500	3 500	3 500	3 800	1 040	4 354
Biota	600	169	600	1 000	1 000	1 000
Geological factors	10 000	10 000	10 000	10 000	10 000	9 000
Soil	9 200	9 200	9 200	9 600	9 100	7 000
Forests	1 720	2 900	2 900	4 400	8 000	17 159
Xenobiotic substances	27 032	28 400	27 381	12 454.2	15 301	8 500
Total costs	**156 105**	**152 091**	**132 627**	**129 402.2**	**196 417**	**237 111**
MoESR costs	118 153	111 591	93 146	102 948	164 016	204 452

Source: MoE SR

• ENVIRONMENTAL INFORMATION SYSTEM

Environmental information system integrates information from environmental monitoring, information from environmental assessment, and spatial information on territory. Other generated information support activities of environment authorities and subjects that enforce legislation within environmental law. These include mainly the Ministry of Environment of the Slovak Republic (MoE SR) and its affiliated organisations, as well as other institutions under different ministries. MoE SR and its daughter organisations maintain other databases, information systems, and internet and intranet portals to support their activities and present their outcomes.

For more information on the organisational structure and pertinent responsibilities, see EnviroInfo meta-information system.

Enviroportal is the gateway to all the mentioned environmental information (www.enviroportal.sk) that gathers data sources through the Ministry's local computer network.

Overview of the major information systems and databases created and maintained at the SR Ministry of Environment, that contain environmental information

Name of Information System	Operator	Description of IS	In operation since*
Information Environmental System (IES)	SEA	Obtains information from the following systems, subsystems, and databases.	
Enviroportál	SEA	Gateway to environmental information with up-to-date reports including information on amendment procedures, together with discussion forums, and information on environment-related, address books, shortcuts, information on projects and other environmental information. See www.enviroportal.sk .	2005
EnviroInfo - metainformation on environment	SEA	Summary information on location of sources, organisation and competencies within the Ministry of Environment. More detailed classification into databases, documents, raster and vector layers of the geographic information systems.	new version since 2005
GEMET Database	SEA	Multi-lingual lexicon of environmental terminology	
Environmental videography	SEA	Internet-based accessible catalogue of films and video programmes featuring the topics of environment composed of the international Envirofilm films. After watching the trailer, it is possible to borrow the film over the internet at no cost.	2005
Information monitoring system (IMS)	SEA	Integrates information from ten partial monitoring subsystems. See the overview above.	1999, new version since 2005
Information system on territory (IST)	SEA	Ensures spatial data needed for decision making within the territory and for spatial interpretation of database-retrieved data. ISÚ as a geographically-based system is a cross-sectional information system that provides support for other information systems. A system-based approach besides the very technological solution comprises also a system of securing all functions and tasks that altogether create conditions for the creation and operation of the National infrastructure of spatial information. It further administers, processes and publishes spatial data on territory, both within the domain of the Ministry of Environment of SR, as well as for the public. The scope of spatial data is determined by the Catalogue of objects at the Ministry of Environment of the SR, while the available spatial data are described in form of standardised metainformation operated by a metainformation system. The IST architecture builds on the principle of mutual interchange of spatial data from distributed data storages within the Ministry of Environment domain, other ministries, as well as all suppliers of spatial data that allow access to their data storages. Within the IST further development, big emphasis is placed on harmonisation with parallel activities on the national as well as international levels, and compliance with the prepared EU Directive for INSPIRE, as well as supply of spatial data through a standardised way, emphasizing the support of interoperability (mutual functional sharing, not dependant on technological platform)	2004
Information system on the		ISS consists of information files, both in text and table formats that describe the state of environment	

state of environment (ISS)		over the recent time period. The information is categorised by environment components, indicators, and years. Some information is assessed in relation to impacts of economic activities. Institutions within and outside of the Ministry supply documentation that the SEA processes into summary reports or overviews of different classification.	
Information system of environment departments and offices (ISEDO)	SEA	ISEDO gradually ensures information support for state administration activities in the area of environmental creation and protection. Therefore, it consists of subsystems defined by duties of the state administration within the area of environment under Act No. 525/2003 Coll. on state administration of environmental protection. This means that regional and local Environment Offices have competencies within the state administration of environment protection and creation, in the following areas: a) water management, protection of water quality and volumes and it rational use, b) nature and landscape protection, c) protection and regulation of trading endangered species of wildlife animals and plants, d) fishing, excluding fisheries, e) air and Earth ozone layer protection, f) waste management, g) packages and packaging waste, h) prevention of major industrial accidents, i) environmental impact assessment There is a connection to specific information systems to support the implementation of individual legislation documents in the area of environment.	2004
Information system of the environmental impact assessment (IS EIA)	SEA	IS on the state, process, and outcomes of environmental impact assessment. Ensures information flow among participants to the EIA process (proponent, pertinent authority, permitting authority, impacted authority, impacted municipality, public, and qualified persons). At the same time is ensures compliance with the Ministry's obligations set forth by Sect. 38 of Act on environmental impact assessment, e.g. providing of information from documents and files. In its content, the information system includes input information on assessed activities within the EIA process, position statements to activities in the EIA process, and lists and information related to pertinent issues. Technically, the system has the form of a web application through which the impacted authorities connect onto the central database. After authorisation and verification steps, they may input their own data as well as retrieve information. The public can in a specific way access data that can be published.	Part dealing with impact assessment of strategic documents in operation since 2003/2006
IS of integrated pollution prevention and control (IPPC)	SEA	After completed, the system will provide information on the status, process, and outcomes of the IPPC permit process, as well as on closely relating activities, including the best available technologies. Creating an IS will secure information support for the execution of state administration activities within the specific area. Meanwhile, this will create a mechanism for collecting, assessment, and supply of information to the public. Pursuant to the IPPC law, state administration is carried out by the Ministry of Environment (MoE SR) and the Slovak Environmental Inspection. (SEI). Environmental authorities represent the affected bodies within the process of licensing as they are the administrative bodies in proceedings governed by individual norms (on air protection, water	first part since 2005

		protection, waste, etc.) merged into a system of integrated licensing. IS IPPC comprises the following parts: - Register of operators and IPPC operations, containing identification data on operations and operators that need the IPPC license - Register of issued integrated licenses - Integrated register of contamination containing data and information supplied every year by operators on their operations, emissions, and outcomes of monitoring. - Register of environmental quality norms for individual sites within the SR - BAT and BREF register containing the best available techniques for individual industrial sectors and types of operations - Register of authorised persons within IPPC Technically, the system has the form of a web application through which the impacted authorities connect onto the central database. After authorisation and verification steps, they may input their own data as well as retrieve information. The public can in a specific way access data that can be published.	
Information system of major industrial accidents (IS MIA)	SEA	Makes available documents relating to the whole process of major industrial accidents prevention, including preparation of their reports for JRC. Comprises 3 registers: - register of business (regulated by the MIA legislation) containing identification data of a company, operator, and a list of selected chemical substances present in the company - register of accidents that supplies information on occurred accidents, their causes, consequences and their troubleshooting - register of authorised persons that contains a list of emergency technicians, list of MIA specialists, and list of authorised personnel	2004
Regional Waste Information System (IS RISOnet)	SEA	Provides for system of gathering data on all areas of waste management activities in the SR, registers of waste generators and keepers, data on waste generation and disposal, as well as records of operators and waste reclamation and elimination facilities, records of landfills, and records of hazardous substances transport. The system has been expanded through creation of modules in order to access data to be used by SEI and Recycling funds. Also, a module for publishing specific information online has been created. RISOnet also contains a module for automatic input of digital data from individual obliged subjects into the information system.	2002
IS Packaging	SEA	IS Packaging constitutes an instrument that serves to monitor partial objectives in the area of waste reclamation and packaging waste recycling.	2005
IS POVAPSYS	SHMI	IS should help through: 1. Increasing the prior forecast and warning time, which will create conditions for better protection of property and lives against floods 2. Ensure more exact and more reliable forecasts and warnings, 3. Ensure a greater number of forecasts for specific time periods and for more sites, 4. Provide outcomes and data available through the Internet or directly by the user. 5. Interconnect information with Hungary, Ukraine, Poland, Czech Republic, Austria, and Germany.	first part since 2005

Hydrological Information System (HIS)	SHMI	Includes Slovak hydrological data by different modes of operation - long-term information on individual network of stations (catalogues), and detected or otherwise acquired hydrological data (registers). Central office is in Bratislava accessed by the SHMI users in Slovakia (Žilina, B. Bystrica, Košice) through user applications (uploads, updates, print administration, overturn administration). Ensures batch saving of sources, interactive update, verification, archiving, statistical processing, and distribution of data through professional data guarantors to the end user.	
Climatology and Meteorology Information System (CMIS)	SHMI	Addresses operational and research activities of all climatology and selected meteorology fields.	
Complex Water Register (CWR)	SHMI	Contains selected information and data on the state of surface and ground water, information on the volume and quality of water formations, data on surface water extraction, on the volume of discharged water, on produced and discharged waste water contamination, acquired from water users through their mandatory notification to SHMI, data on legal water registries, data on protected territories connected to water protection (water courses, major water management courses, etc.)) and annual data on emissions to surface water from operators under legislation on IPPC	
Database of single sources of water contamination	SHMI	Created to store information on location and character of potential sources of contamination of surface and groundwater. Also includes the risk assessment module that allows assigning a risk score to individual sites. The module forms the basis for identification of potential sites that are most hazardous to surface and ground water formations as the result of their non-compliance with environmental objectives.	
National Emission Inventory System (NEIS)	SHMI	Includes information on operators, emissions, and technologies of large and medium-size air pollution sources. Provides: collection of data, imposition of fees and creation of output sets for accredited institutions, including sets needed for international exchange of information on emissions. Included is also a module for the operators of air pollution sources, which allows automated calculation of emissions, supplies the needed data in compliance with legislation, and allows importing data directly into NEIS.	
State Register of Protected Areas	SMNPaS SNC SR	Includes data on graphical layers and databases from the area of spatial and individual protection of flora and fauna, and biotopes of European and national significance (State Register of Protected Areas, SSPA and LSPA, Protected Trees Catalogue, Natura 2000 SK) and their updates, catalogue of increments of Protected Areas (PA) and Protective Zones (PZ), Catalogue on PA and PZ.	gradually since 2002
Databases	SMOPaJ	Protected Bird Territories database (since 2004), Cave Database of Slovak Republic (since 2003), Journal Database System BACH.	
Information system of taxons and biotopes and other nature protection databases	SNC SR	Database of taxons and biotopes (since 2002), Database of Waterfalls (since 2004), database of bear monitoring (since 2003), CITES database (since 2004), Database of barrier components in landscape, Database of introduced and invasive taxons of plants and animals, Database of Europe's significant taxons of animals and plants.	
International species information system and other databases	ZOO Bojnice	International Species Information System Database - international inventory system of animals raised in ZOO, Yearbook of the Union of Czech and Slovak ZOOs.	

Databases	WRI	Water management plans of watersheds (surface and groundwater sources, water demand and regional water management strategies), Water management balance (data on balance assessment profiles, flows and impacts on water utilisation), Hydro-energy potential of watercourses (water bodies constructed, under construction, and planned, large and small aquatic power plants) Database of watercourses, Database of yields and extractions from water sources, Information Water Supplies and Sewerage Systems administered by water management companies and municipal offices, Geographical Information System on drinking water supply and sewerage system installation in Slovak villages in connection to Water Supply and Sewerage Database, Data on Water Management Construction funded from investments, and on operations in Slovakia, Drinking Water Quality Indicators Database, Database of production and qualitative composition of sludge from municipal wastewater treatment plants, its use and elimination, Database of water contamination dealing with organisations, technologies, substances, and their elimination, Database of technological and operation data of wastewater treatment plants, Database of technological and operation data of water treatment plants, Database of surface and groundwater sources, large and small water dams and water management protection zones.	
Databases and the GIS layers	SCA	DSPELEO National database of caves, Hydrological, climatic and bio-speleological monitoring, Geographical Information System of Cave Protection.	
Databases	SMM	BACH and AMIS Collection Database Systems.	
Databases	SEI	Databases from the activities of the inspection for waste, water, air, nature protection, and IPPC.	
Databases and registers	SGI DS	Register of bores (since 2000) and HG wells, abandoned mining sites, slides, Register of mapping (since 2002), Register of geological mapping (since 2002), Register of geo-physical mapping, Register of geo-chemical mapping, Register of surveillance and perspective surveillance areas, Landfill Register, Register of Exclusive Deposits (since 2002), Register of Physical Documents (since 2000), Register of old environmental loads on the rocks, Register of Digitalized Geological Maps, Digitalized Geological Map of the Slovak Republic (since 2006).	
Register of basic residential units (RBRU)	SEA	The BRU register is the basic numbering reference of the EIS components. It provides for spatial identification of information. Definite spatial identification (localisation) of elements is one of the basic conditions for mutual communication and interconnectedness of public administration information systems. Directive on spatial identification sets forth localisation of information by standard spatial units (cadastre territories, municipalities, districts,...) New element in the structure of spatial units (SU) under this directive includes basic residential units delineated within the territory on the basis of settlement structure as an element that is independent of relatively frequent changes within the structures of administrative layout. For each element of the spatial unit set, being the basic identifier has been assigned an independent identification number from a prior determined sequence of numbers that remains unchanged during the whole existence of the SU. Identification numbers and other characteristics of SU are listed in centrally operated computer registers. Their major data are published in numbering references of spatial units. Set of the ZSJ and spatial units with determined identifiers has been successfully implemented at creation and maintenance of different records and large-scale surveys (registers of municipalities, register of landfills, numerical reference of cadastre areas, registers of public utility equipments, etc.)	

* missing information *In operation since:* means that the operation began before 2002. Source: MoE SR

Environment *is everything that creates natural conditions for existence of organisms, including the humans, and is a condition of their further development. Environment is created* ***by its parts,*** *first of all air, water, rocks, soil and living organisms.*

§2 of Act No 17/1992 Coll. on Natural Environment as amended

COMPONENTS OF THE ENVIRONMENT AND THEIR PROTECTION

• AIR

Emission situation

♦ **Balance of particulate matter emissions**

Pursuant to Act 478/2002 Coll. on air protection, which amends Act 401/1998 Coll. on fees for air pollution as amended (Air Act) (Sect. 19, par. 2(d)) an operator of a **large and medium-sized source** is required to provide to the pertinent local environment protection authority always before February 15 of the current year, a complete and true information on the source, emissions, and keeping of the emission limits and quota for the previous calendar year. Local environmental protection authority will submit these processed electronic data to the authorized MoE SR organization - the SHMI (Slovak Hydrometeorological Institute), which operates the central **National Emission Inventory System (NEIS)**. SHMI processes these data on the national level. In 2001, the SHMI for the first time collected and processed information through the NEIS module, which replaced the previously used REZZO system.

SHMI assesses the volume of polluting compond emissions from the from **small sources** on a yerly basis, based on the volume and quality of sold solid fuels to retailers and households. This information is available from the submitted data to the local environment protection authority by individual sellers, as well as from natural gas consumption by households.

Mobile sources emissions have been monitored since 1990 and are determined on the year-to-year basis. To calculate road transport emissions, the method of Computer Programme to Calculate Emissions from Road Transport (COPERT) is used. The method builds on the number of individual automobile types, volume of travelled kilometres, and consumption of individual fuel types. Besides road transport, calculated are also emissions from the railway, air, and ship transports, all in compliance with the Intergovernmental Panel Climate Change (IPCC) methodology.

- **History of particulate matter emissions and sulphur dioxide emissions**

Emissions of solids and **sulphur dioxide (SO_2)** have shown a steady reduction since 1990, which, apart from reduction in production and energy consumption, has been caused by a change within the fuel group toward more purified fuels, as well as by using fuels with higher quality labels.

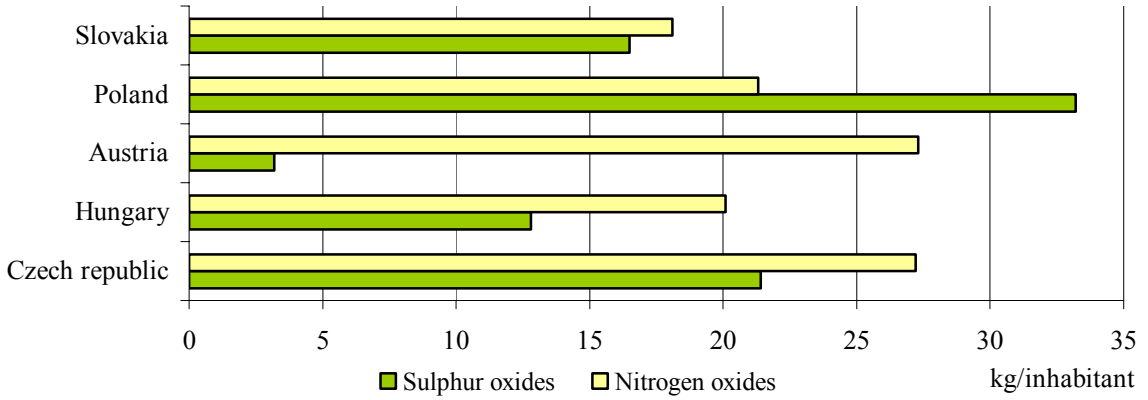
- **Trend in emissions of nitrogen oxides**

Nitrogen emissions (NO_X) have shown a slight reduction since 1990. Slight increase in emissions in 1995 was related to an increased consumption of natural gas. Decrease in nitrogen oxides in 1996 was caused by a change to the emission factor that took into consideration the level of equipment and technology of incineration processes. Reduction in solid fuel consumption since 1997 has led to a further decrease in NO_X emissions. In the years 2002 and 2003, de-nitrification played a significant role in emission reduction (electric power plant Vojany). In 2006, there was a significant reduction in the NO_X emissions, especially in case of large and medium stationary sources. This reduction relates to reduced production (Zemianske Kostoľany and Vojany electrical power plants) and consumption of solid fuels and natural gas (Zemianske Kostoľany and Vojany electrical power plants and the Slovak gas industry company – transit, Inc. Nitra - /SPP/). Mobile sources also, mainly road transportation, have shown significant NO_X emissions. This reduction relates to reduced consumption of liquid carbohydrate fuels, compared to 2005, as well as to renovated fleet of personal and cargo vehicles.

- **Trend in carbon monoxide emissions**

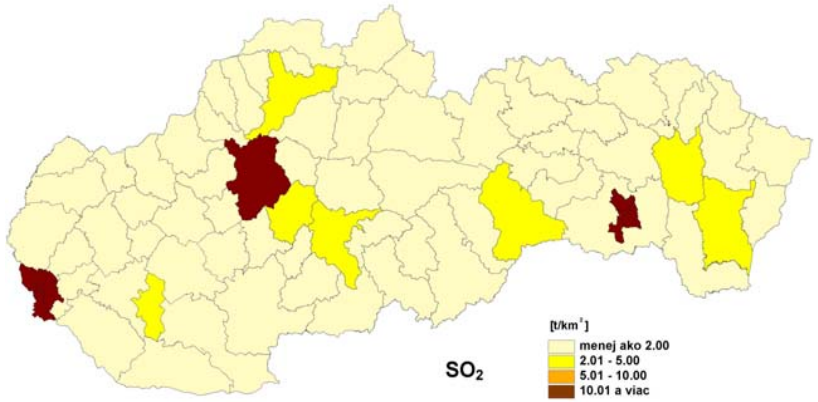
Carbon monoxide emissions (CO) since 1990 have shown a falling tendency, which was caused mainly by reduced consumption and change in fuel composition in the sphere of retail consumers. CO emissions from large sources were decreasing only slightly. The most significant share on CO emissions from large sources comes from iron and steel industries.

Emissions of nitrogen oxides (NO_X) and sulphur oxides (SO_X) per capita in Slovakia and neighbouring countries in 2005



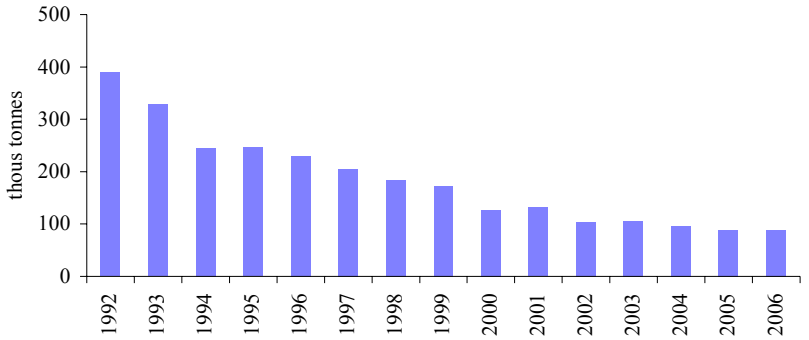
Source: OECD

Element regional emission of SO_2 in 2006 ($t.km^{-2}$)



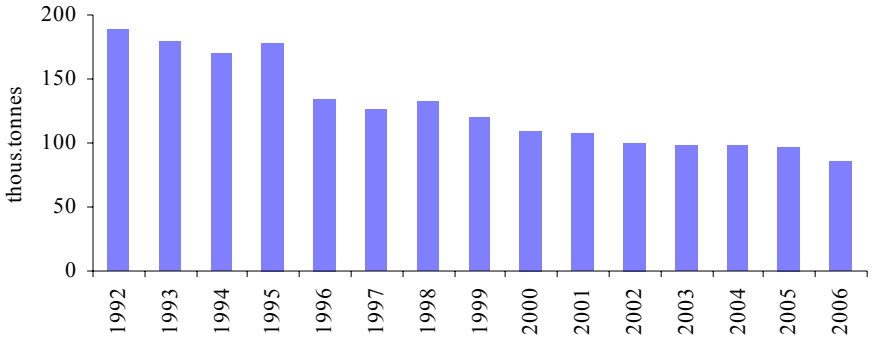
Source: SHMI

Trend in emission of SO_2



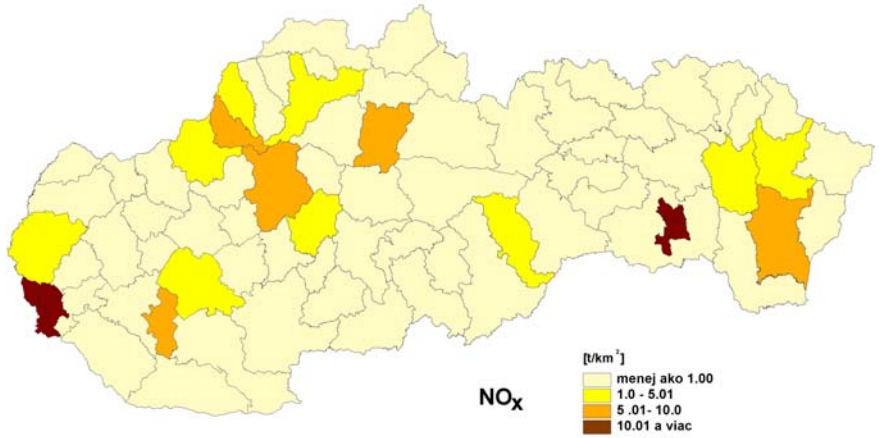
Source: SHMI

Trend in emission of NO_x



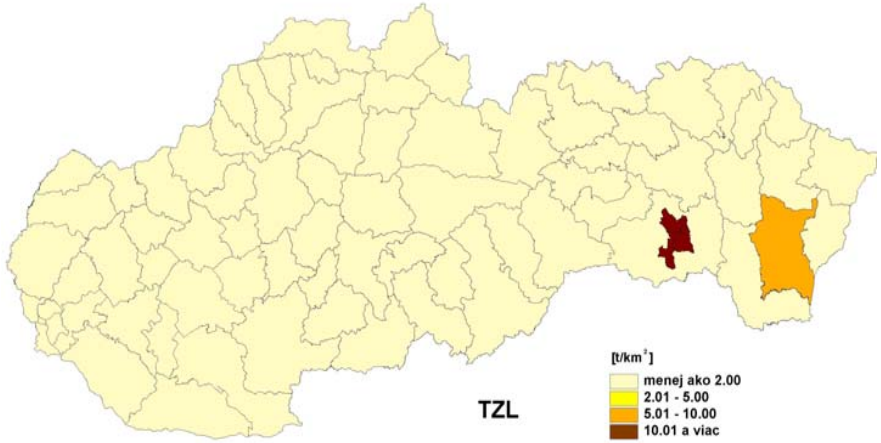
Source: SHMI

Element regional emission of NO_x in 2006 ($t.km^{-2}$)



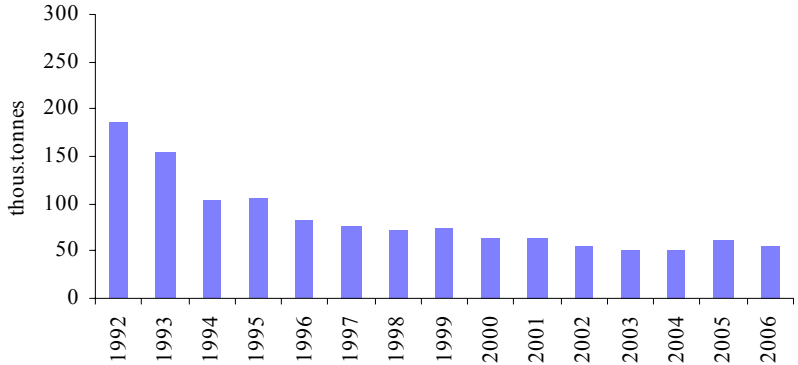
Source: SHMI

Element regional emission of PM in 2006 (t.km^{-2})



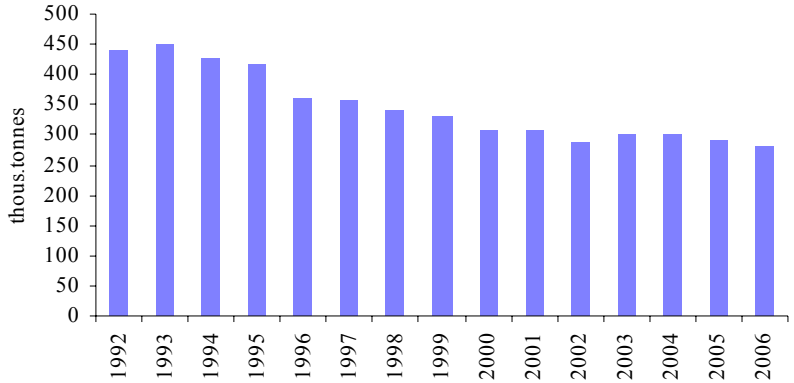
Source: SHMI

Trend in emission of PM



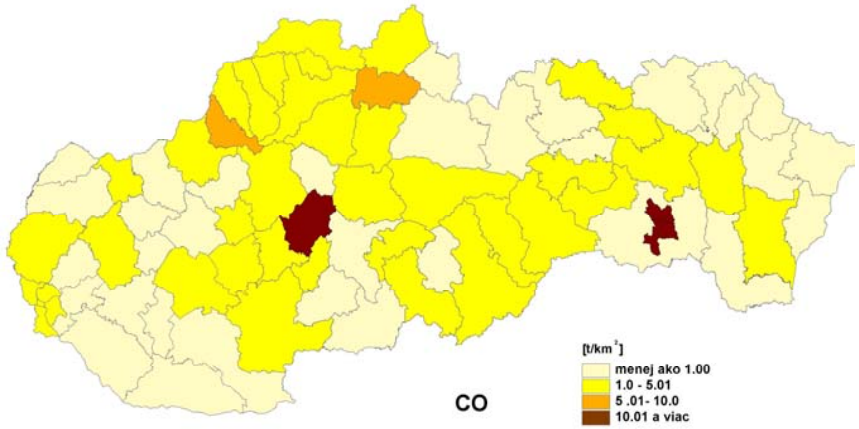
Source: SHMI

Trend in emission of CO



Source: SHMI

Element regional emission of CO in 2006 (t.km^{-2})

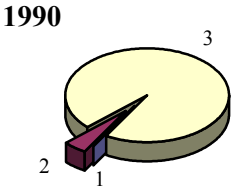


Source: SHMI

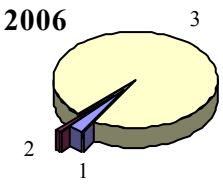
♦ **Balance of ammonia emissions (NH_3)**

NH_3 emissions in 2006 reached 26 665.7 tons. In 1990-2006 ammonia emissions were reduced by 59 %. This reduction was caused mainly by changes in agriculture. Numbers of livestock was reduced, which in turn contributed to decreased production of animal waste. Organic and industrial fertiliser volumes on agricultural land were also reduced.

The contribution of the particular sectors in NH_3 emission



0.05 %	1. Transport	2.73 %
4.79 %	2. Industry	1.10 %
95.17 %	3. Agriculture	96.17 %



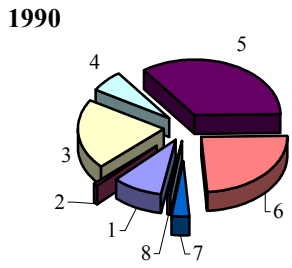
Source: SHMI

Emissions were stated to the date 31.10.2007

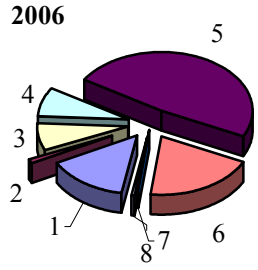
♦ **Emissions of non-methane volatile organic compounds**

NM VOC emissions show a lasting decreasing trend since 1990. In 2006, volume of **NM VOC** emissions reached the value of 78 397 tons, which is a reduction by 43.2 %, compared to 1990.

The contribution of the NM VOC emission according to sector of their origin



9.4 %	1. Combustion processes	14.4 %
0.8 %	2. Combustion processes in the industry	1.1 %
20.5 %	3. Industrial technologies	7.4 %
6.4 %	4. Mining and distribution of raw materials	8.0 %
34.8 %	5. Using the solvents and other products	48.1 %
24.3 %	6. Transport	19.6 %
3.3 %	7. Waste disposal	0.3 %
0.5 %	8. Agriculture	0.6 %

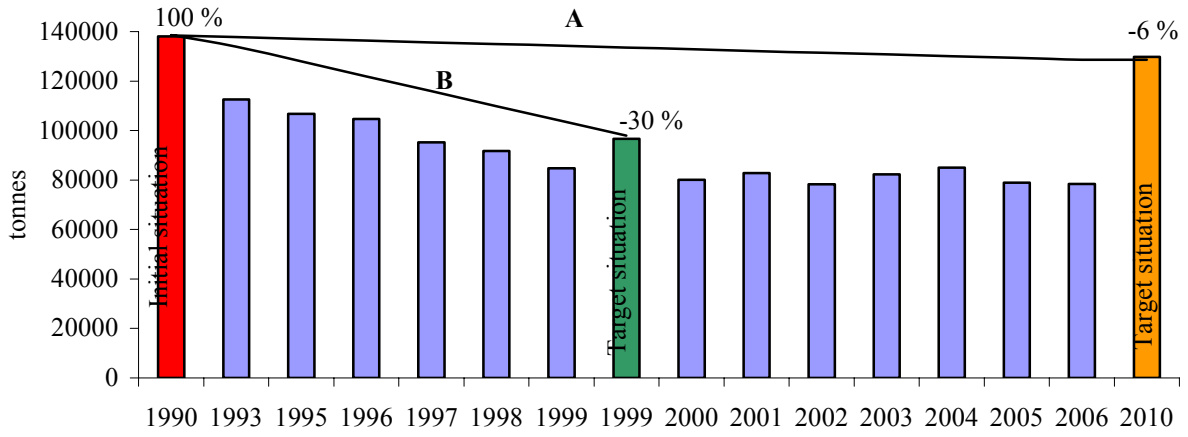


Source: SHMI

Emissions were stated to the date 31.10.2007

In 1999, the Slovak Republic signed the Protocol on the Reduction of Acidification, Eutrophication and Ground Ozone, and bound itself to reduce the volume of NM VOC by 6 % by 2010, compared to emissions from 1990. This plan has been followed so far.

Trend in NM VOC emissions with regard to fulfilling of the international agreements (tons)



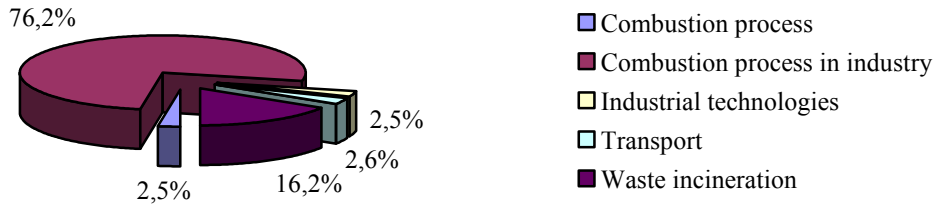
Source: SHMI

A – Reduction aim of the Protocol to abate acidification, eutrophication and tropospheric ozone
B – Reduction aim of the Protocol on limitation of VOC emissions or their Cross-Border Transfers

♦ **Balance of heavy metals emissions**

Heavy metal emissions (Pb, As, Cd, Cr, Cu, Hg, Ni, Se, Zn) have been decreasing since 1990. In that year, heavy metal emissions were at the volume of 675.44 tons, while in 2006 it was 287.77 tons, which is a 57 % reduction in comparison to 1990. Besides shutting off a number of old-fashioned and non-effective technologies, this trend has been influenced by extensive reconstructions of the separation equipment, change in raw material used, and, most of all, by transition to using unleaded petrol types. Since 2003 there has been an increase in Pb emissions as a consequence of increasing production in the areas of ore agglomeration and copper production.

The contribution of the particular sectors in the Pb emission production for year 2006

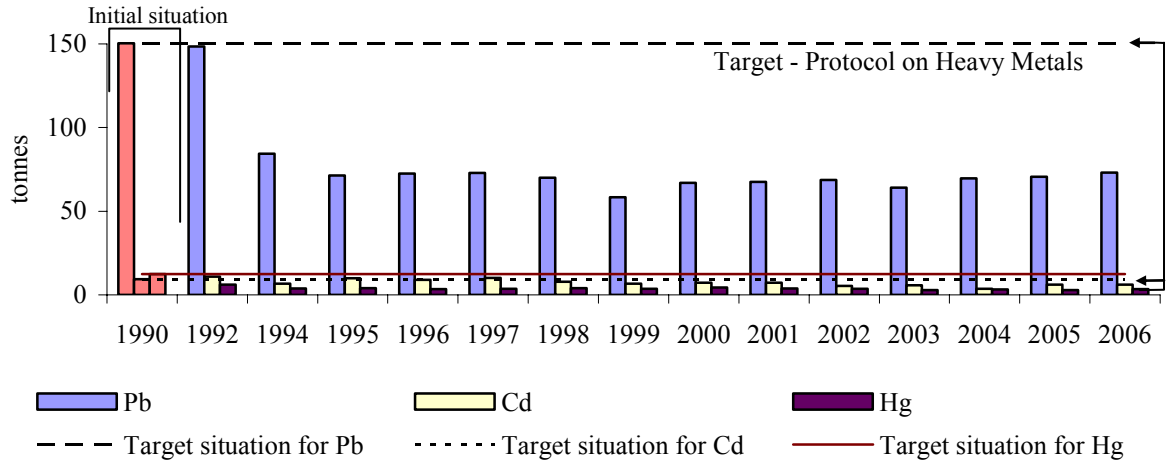


Emissions were stated to the date 31.10.2007

Source: SHMI

Heavy metals in the air do not represent an environmental issue of only one country. In 1998, the **Protocol on heavy metals** was drafted in Aarhus. This document **followed the UN EEC Convention on Long - Range Trans-boundary Air Pollution,** whose only objective is the decrease heavy metal emissions (Pb, Cd, Hg) to the level of 1990. SR signed this Protocol in that same year. This goal is still being followed.

Trend in emissions of heavy metals regarding the fulfillment of the international conventions

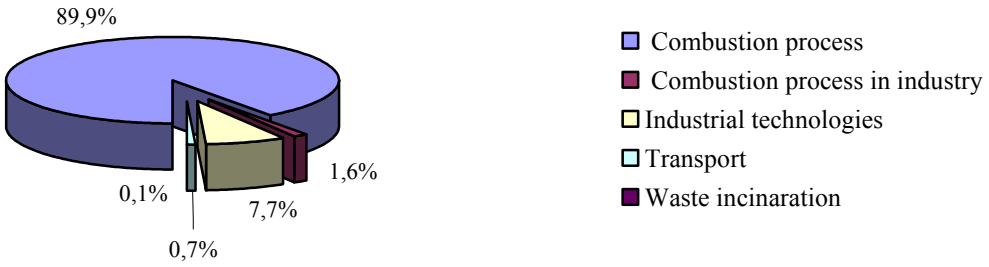


Emissions were stated to the date 31.10.2007 Source: SHMI

♦ **Balance of Persistent organic pollutants (POPs)**

In 1990-2006 **emissions of persistent organic particles** (PCDD/PCDF, PCB, and PAH {B(a)P, B(k)F, B(b)F, I(1,2,3-cd)P}) had a decreasing trend with fluctuating characteristics over the last years. They were most apparent in the emissions of poly-aromatic carbohydrates (PAH).

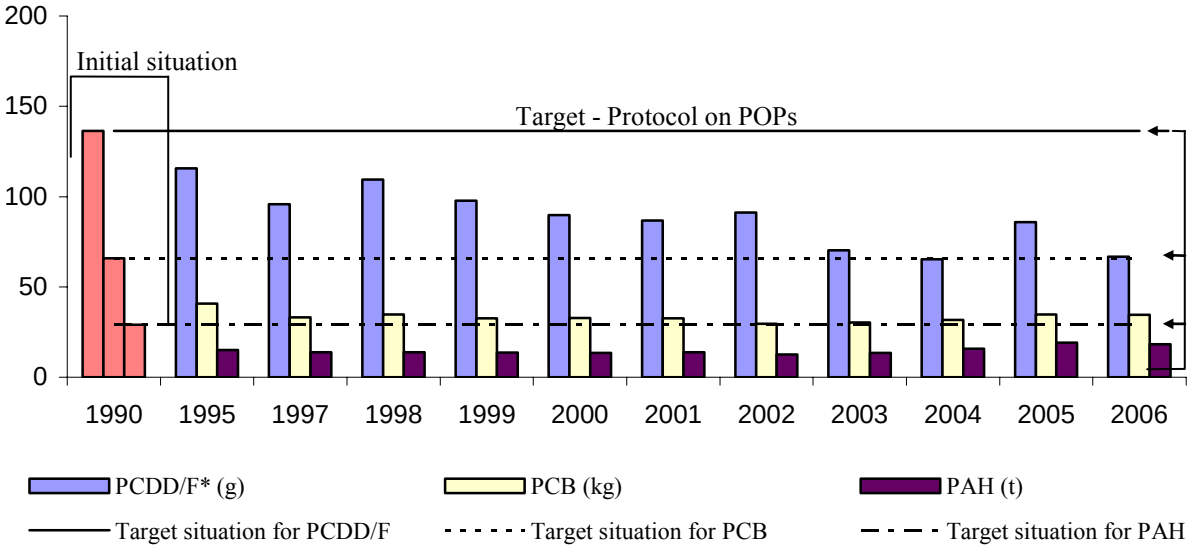
The contribution of the particular sectors in the PAH emission production for year 2006



Emissions were stated to the date 31.10.2007 Source: SHMI

In 1998, the Slovak Republic also accessed to **Protocol on Limitation of Persistent Organic Compounds (POP) Emissions under the mentioned Convention**, whose objective was to reduce POP emissions to the emission level of the year 1990, compared to the reference year of 1990. The Slovak Republic signed the Protocol in the same year. This goal is still being followed.

Trend of POPs emissions regarding the fulfillment of the international conventions



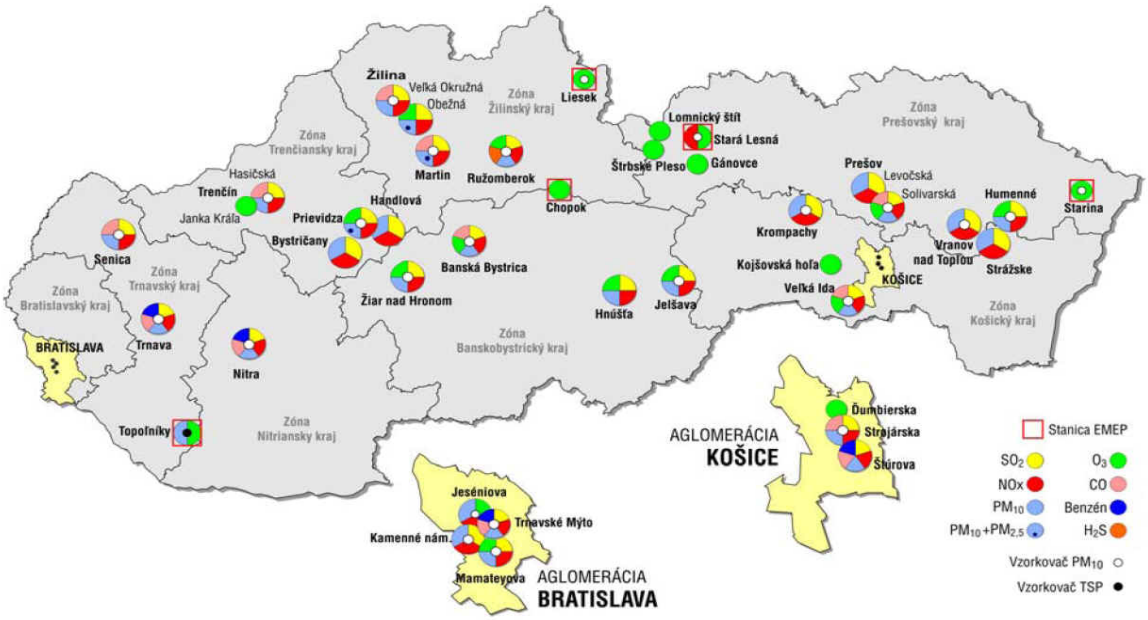
Source: SHMI

Air pollution

- **National monitoring air quality network**

In 2007, the **national air assessment quality monitoring network consisted of 34 automated monitoring stations including 4 stations to monitor regional air pollution and precipitation water chemical composition**. Stations that monitor regional air pollution are part of the EMEP – Co-operative Program for the Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe.

National monitoring air quality network - owned by SHMI



Source: SHMI

- **Local air pollution**

Assessment of local air pollution focuses on air quality in residential areas, and belongs to critical indicators of the quality of environment.

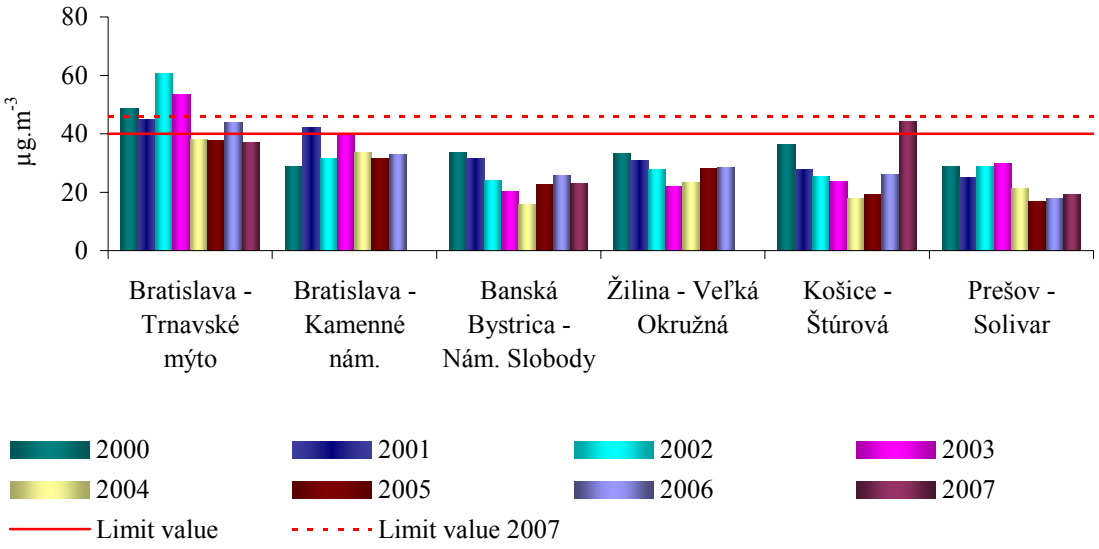
Sulfur dioxide

In 2007, no agglomeration showed exceeded levels of pollution in hourly or daily values beyond the public health limit.

Nitrogen dioxide

In 2007, yearly limit value was exceeded only at the Košice - Štúrova monitoring station, however, the yearly limit value incremented with tolerance threshold was no exceeded. Exceeded values for public health protection for hour concentrations were not detected at any monitoring station.

Average annual concentrations of nitrogen dioxide at selected monitoring stations



Source: SHMI

PM_{10}

The biggest challenge in the area of air protection in Slovakia and most European countries is currently air pollution by particulate matter (PM_{10}). In 2007, there was a significant reduction in the PM_{10} pollution level at most NMSKO stations. Despite this fact, 14 stations showed exceeded 24-hour values for this particular pollutant, while 4 AMS showed exceeded also the yearly limit value.

Carbon monoxide

Carbon monoxide pollution level is relatively low and limit value was not exceeded at any monitoring station.

Lead

None of the monitoring stations showed exceeded limit value. Pollution level for the previous period of 2003-2007 is below the bottom assessment threshold.

Benzene

In 2007, highest benzene level of 2.0 μg.m^{-3} was detected at the stations of Bratislava - Mamateyova, and Trenčín – Hasičská, which is below the 5.0 μg.m^{-3} limit value, which will become effective as from 2010.

Heavy metals

In 2007 no pollutant limit values were exceeded.

- **Regional air pollution**

Average annual concentrations of air-borne hazardous compounds – 2007

Station	Prach μg.m^{-3}	SO_2-S μg.m^{-3}	NO_2-N μg.m^{-3}	HNO_3-N μg.m^{-3}	SO_4^{2-}-S μg.m^{-3}	NO_3^--N μg.m^{-3}	O_3 μg.m^{-3}	Pb μg.m^{-3}	Cu μg.m^{-3}	Cd μg.m^{-3}	Ni μg.m^{-3}	Cr μg.m^{-3}	Zn μg.m^{-3}	As μg.m^{-3}
Chopok	5.1	0.18	0.72	0.01	0.27	0.08	92	1.59	0.84	0.05	0.44	0.60	4.14	0.13
Stará Lesná	12.6	-	-	-	-	-	68	5.92	2.39	0.20	0.44	0.48	13.03	0.52
Starina	17.7	0.80	1.24	0.02	0.86	0.32	63	8.46	2.10	0.29	0.58	0.59	12.61	0.45
Topoľníky	23.2	-	-	-	-	-	58	11.09	4.11	0.28	1.15	1.01	19.44	0.83

Source: SHMI

Sulfur dioxide, sulfates

In 2007, regional sulphur dioxide concentrations calculated per sulphur were 0.18 μg.m^{-3} at Chopok, and 0.80 μg.m^{-3} at Starina.

In line with Annex 1 of the MoE SR Resolution No. 705/2002 Coll. quoting Resolution 351/2007 Coll., the limit value for the protection of ecosystems is 20 μg $S0_2$.m^{-3} for the calendar year and the winter season. This level was not exceeded neither for the calendar year (Chopok 0.4 μg SO_2.m^{-3}, and Starina 1.6 μg SO_2.m^{-3}) neither for the winter season (Chopok 0.5 μg SO_2.m^{-3}, and Starina 3.3 μg SO_2. m^{-3}).

Percentage share of sulfates on total particulate matter mass was 16 % at Chopok and 15 % at Starina. Sulfates to sulphur dioxide concentration ratios expressed in sulfur was 1.5 at Chopok and 1.1 at Starina.

Nitrogen oxides, nitrates

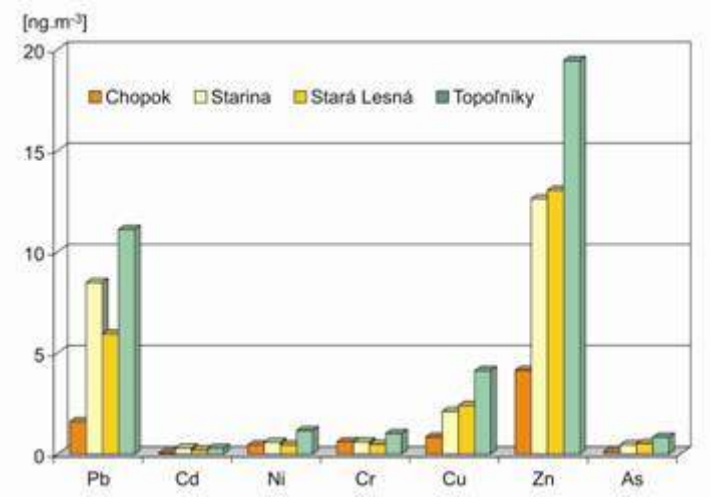
Concentration of nitrogen oxides at regional stations expressed in NO_2-N were in 2007 0.72 μg.m^{-3} at Chopok and 1.24 μg.m^{-3} at Starina. In line with Annex 1 of the MoE SR Resolution No. 705/2002 Coll. quoting Resolution 351/2007 Coll., the **limit value for the protection of ecosystems is 30 μg N.m^{-3}** for the calendar year. This value was not exceeded for the calendar year (Chopok 2.4 μg NO_x.m^{-3} and Starina 4.1 μg NO_x.m^{-3}).

Atmospheric **nitrates** at Chopok and at Starina were mostly in the aerosol form. Gaseous nitrates in 2007 were in comparison with the aerosol ones lower at both stations. Despite the fact that gaseous and particulate nitrates are trapped and monitored separately, their sum is expressed in line with EMEP, since their phase distribution depends on atmospheric temperature and humidity. Percentage share of nitrates on atmospheric aerosol was 6 % at Chopok and 8 % at Starina. Ratio of total nitrates ($HNO_3 + NO_3$) to NO_X-NO_2, as expressed in nitrogen, was 0.13 at Chopok and 0.27 at Starina.

Atmospheric aerosol, heavy metals

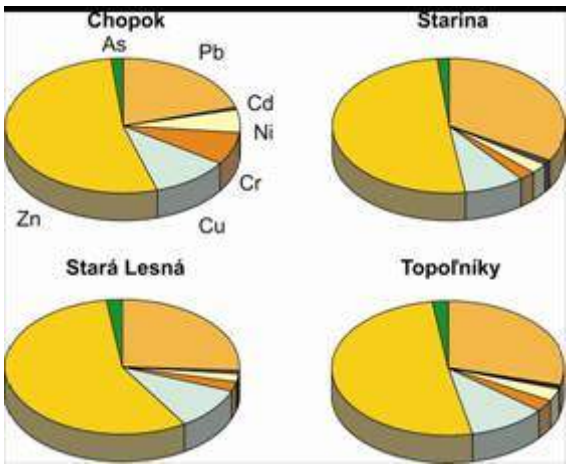
Percentage share of the sum of assessed heavy metals on air-borne dust at regional stations of Slovakia varies between 0.15 and 0.18 %.

Heavy metals in the air - 2007

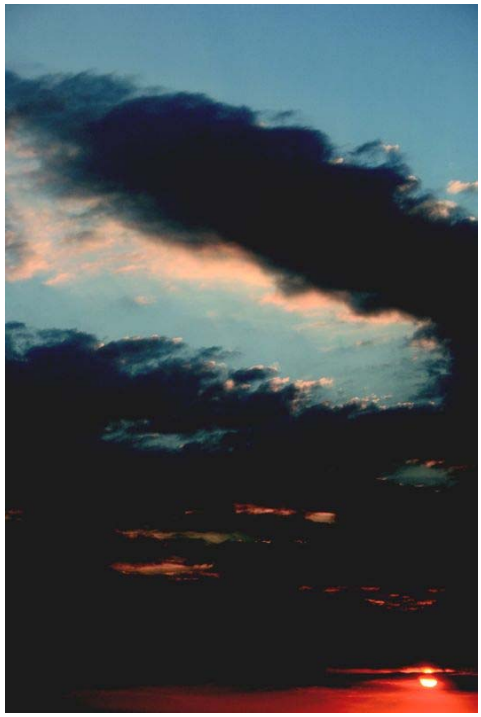


Source: SHMI

Percentage share of heavy metals in 2007



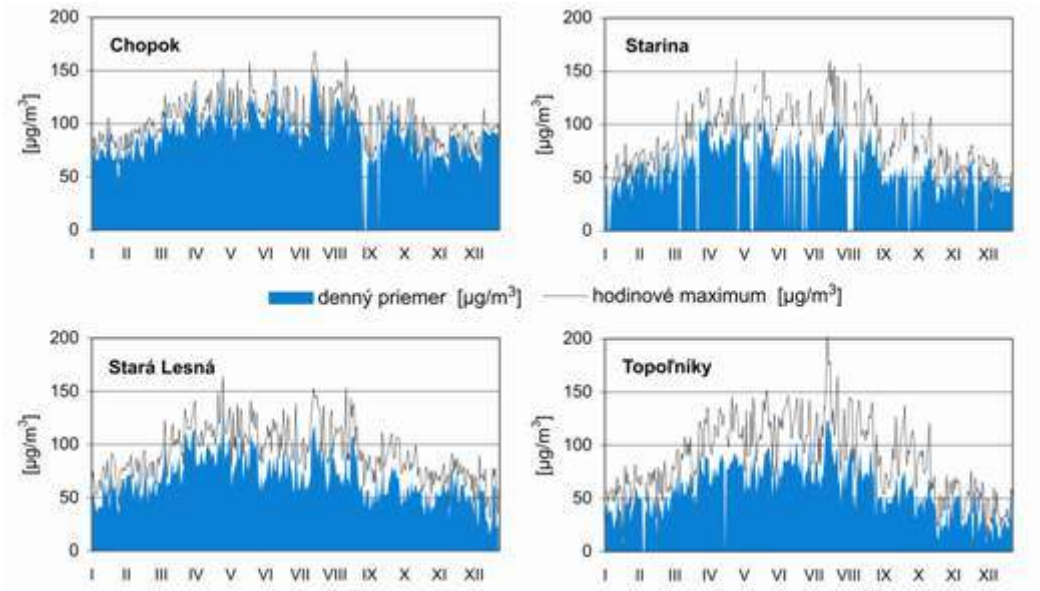
Source: SHMI



Ozone

The following figures show the **annual characteristics in the ozone concentration** at regional stations of Chopok, Starina, Stará Lesná, and Topoľníky. Stará Lesná has had the longest time sequence of ozone measurements since 1992. Ozone measurements at Topoľníky, at Starina, and at Chopok started in the course of the year 1994. In 2007, average ozone concentration at Chopok was 92 µg.m^{-3}, at Stará Lesná 68 µg.m^{-3}, at Topoľníky 58 µg.m^{-3}, and at Starina 63 µg.m^{-3}.

Tropospheric ozone 2007



Source: SHMI

During the years 1970 -1990 was recorded an increase in ozone concentrations by 1-3 µg.m^{-3} per year on average. Following the year 1990, in line with other European monitoring, the trend slowed down and even stopped. This trend relates to the European trend in the generation of ozone precursors.

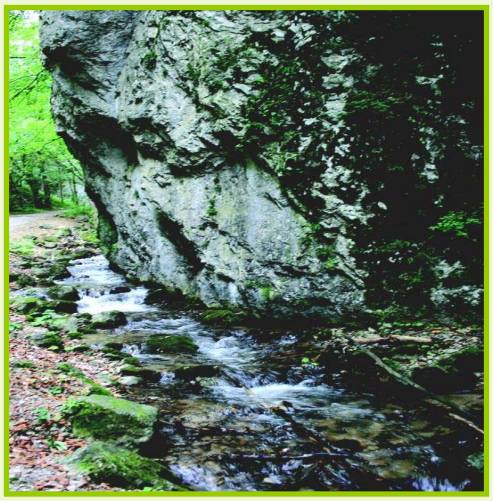
Volatile organic compounds $C_2 – C_6$

Volatile organic compounds (VOC) $C_2 – C_6$ or the so-called light carbohydrates began to be captured at the Starina station in the Fall of 1994. Their concentrations range between individual units to hundreds of units ppb. Ethane presents the worst, next is propane, ethene and acetylene. Isoprene releases from ambient forest.

Average annual VOC concentrations in ambient air (ppb) - Starina 2007

ethane	ethene	propane	propene	i-butane	n-butane	acetylene	butene	pentene	i-pentane	n-pentane	isoprene	n-hexane	benzene	toluene	o-xylene
1.80	0.65	0.80	0.12	0.34	0.31	0.53	0.07	0.02	0.24	0.13	0.15	0.05	0.25	0.03	0.29

Source: SHMI



Whoever is performing an activity, which could have an impact on the ***condition of the surface waters and underground waters, and of water situation,*** *is obliged* ***to exert the necessary effort to provide for their preservation and protection.***

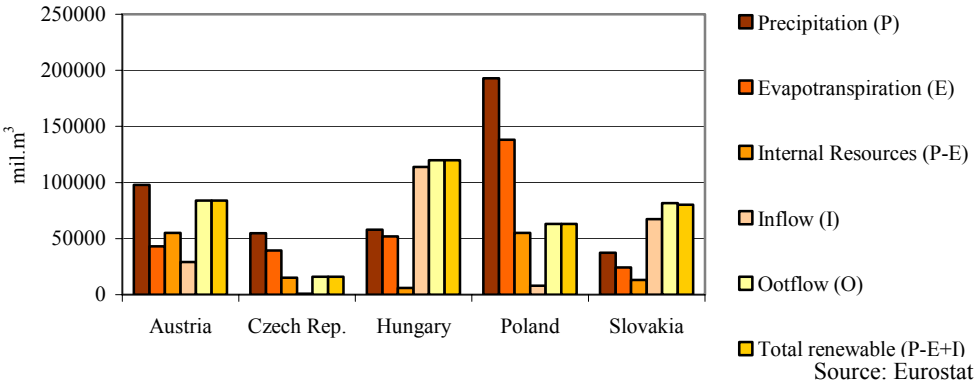
§ 30 par. 1 of the Act No. 364/2004 Coll. on Waters and on Amendment of Act No. 372/1990 Coll. on Offences as amended (Waters Act)

• WATER

Water sources and water fund

Significant part of the Slovak surface water fund flows in from the neighboring states and the usability of this fund is limited. In total, the long-term in-flow average is approximately 2.514 $m^3.s^{-1}$ of water, which is about 86 % of our total surface water fund. In the long run, there is approximately 398 $m^3.s^{-1}$ of water springing in Slovakia, which represents 14 % of the water fund.

Long term freshwater resources in the selected countries in 2007



Source: Eurostat

Surface water

♦ **Precipitation and runoff conditions**

Total **atmospheric precipitations** in the Slovak territory in 2007 reached the value of 854 mm, which represents 112.1 % of the normal level. In terms of precipitations, this year had been considered normal. Total excess of precipitations reached the value of 92 mm.

Average total precipitation in the area of the SR

Month	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	Year
Mm	101	58	70	6	82	92	58	94	133	54	66	39	854
% normal	220	138	149	11	108	107	65	117	210	88	107	74	112
Surplus (+)/ Deficit (-)	55	16	23	-49	6	6	-32	13	70	-7	4	-14	92
Character of rainfall period	MV	V	VV	MS	N	N	S	N	MV	N	N	S	V

Characteristics of the precipitation season: N - normal, S - dry, SS - very dry, V – humid, VV – very humid, MV – exceptionally humid Source: SHMI

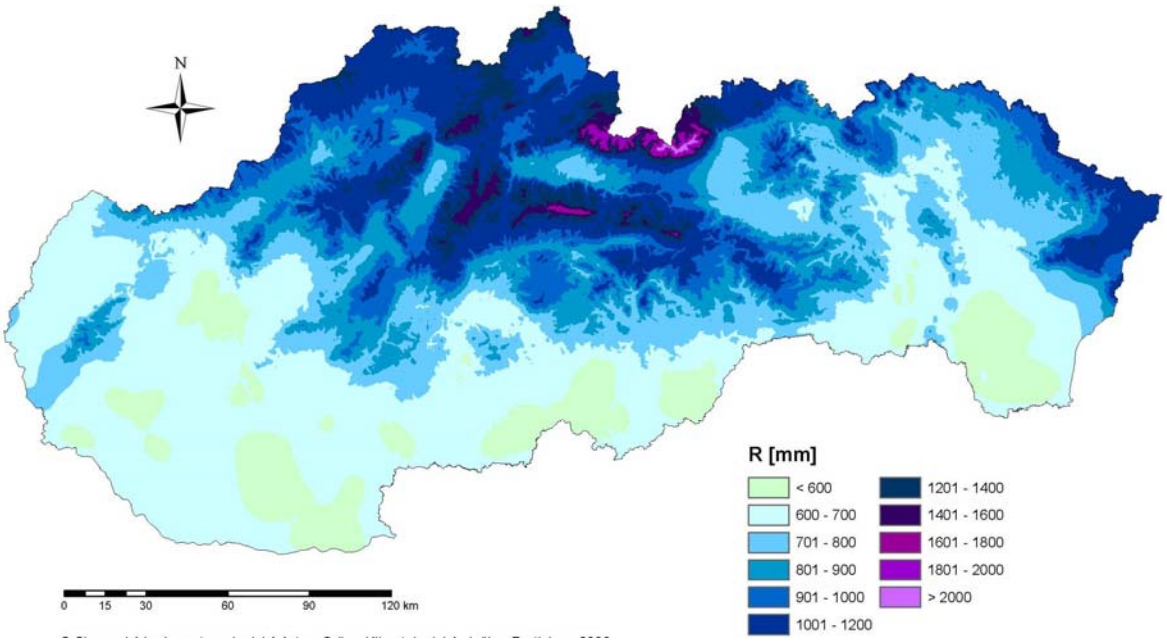
In terms of precipitation period, the year 2007 was humid in the catchments of Váh, Nitra, and Bodrog, and very humid in the catchments of Hornád, Poprad, and Dunajec. The same year was considered normal in all other partial catchments.

Average rates of precipitation and runoff in particular catchment areas

Catchment area	Dunaj		Váh		Hron			Bodrog a Hornád				SR
Subcatchment area	*Morava	*Dunaj	Váh	Nitra	Hron	*Ipeľ	Slaná	Bodva	Hornád	*Bodrog	*Poprad a Dunajec	
Catchment area extent (km^2)	2 282	1 138	14 268	4 501	5 465	3 649	3 217	858	4 414	7 272	1 950	49 014
Average precipitation (mm)	728	650	967	769	869	659	791	745	842	834	1 068	854
% of normal	107	104	115	111	110	96	100	102	124	118	127	112
Character of rainfall period	N	N	V	V	N	N	N	N	VV	V	VV	V
Annual runoff (mm)	65	27	309	113	199	45	98	60	143	198	456	189
% of normal	49	75	99	79	69	33	52	28	32	67	133	72

* watercourses and corresponding data only for the Slovak part of the watershed Source: SHMI
Characteristics of the precipitation season: N - normal, S - dry, SS - very dry, V – humid, VV – very humid, MV – exceptionally humid

Annual atmospheric precipitation (mm) in Slovakia in 2007



Source: SHMI

Annual runoff volumes in SR in 2007 reached 72 % of the long-term average value. Runoff volumes from partial catchments exceeded the long-term average only in the Poprad and Dunajec catchments with the value of 133 %. The remaining catchments showed values within 32 – 99 %.

♦ Water balance

Annual inflow to Slovakia in 2007 was 63 519 mil.m^3, which is 8 192 mil.m^3 less than in 2006. **Runoff** from the territory has grown by 13 053 mil.m^3, compared to the previous year.

Total water volume as of 1.1.2007, in water reservoirs was 766 mil.m^3, which represented 66 % of total usable water volume in water reservoirs. As of 01.01.08, total available volume of the assessed accumulation tanks compared to the previous year 2007 dropped to 798 mil.m^3, which represents 69 % of total exploitable water.

Total hydrological balance of water resources in the SR

	Volume (mil. m^3)		
	2005	**2006**	**2007**
Hydrological balance:			
Rainfall	46 029.00	36 274	39 460
Annual inflow to the SR	69 806.00	70 711	63 519
Annual runoff	79 979.00	85 646	72 593
Annual runoff from the territory of the SR	10 173.00	14 900	9 264
Water management balance			
Total abstraction of the surface and ground water in the SR	906.89	882.47	480
Evaporation from water reservoirs and dams	5.07	55.79	62
Discharge into surface waters	872.00	669.7	628
Impact of water reservoirs (WR)	111.61	7.8	
	improving	**improving**	**accumulation**
Total volume in WR as of 1st January of the following year	721.00	681.60	798
% of supply volume in accumulation WR in the SR	62.00	59.00	69
Rate of water exploitation (%)	8.91	6.38	5

Source: SHMI

♦ Surface water abstraction

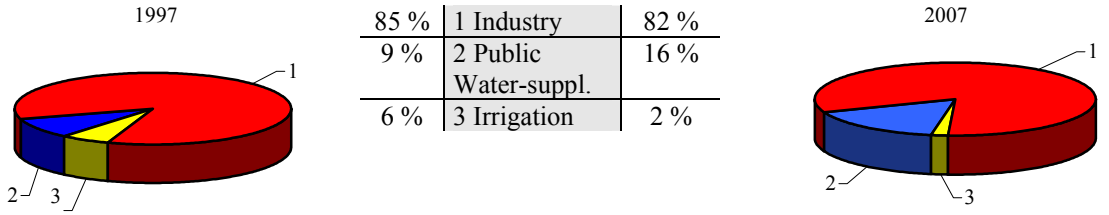
In 2007, surface water abstraction dropped to 326.139 mil.m^3, which means a reduction by 17.5 %, compared to the previous year. This year shows reduced abstractions for all surface water users. Industrial abstractions in 2007 reached 266.78 mil.m^3, which is 56.93 mil.m^3 less than in 2006, e.g. 17.7 %. A slight reduction was recorded also in surface water abstractions for waterlines, which, compared to the previous year, dropped by 2.33 mil.m^3, that is 4.2 %. Surface water abstractions for irrigation purposes also decreased, reaching the value of 6.04 mil.m^3. This means a reduction by 62 %. (Data on surface water use since 2006 have been calculated using information retrieved from the Complex Water Register maintained at SHMI. In previous years, data from the SWME, database were also added to this information.)

Surface water exploitation in the SR (mil.m^3)

Year	Public water-supplies	Industry	Irrigation	Other agriculture	Total	Discharging
1997	73.826	690.733	46.894	0.0360	811.484	1 114.608
2005*	53.828	467.957	11.006	0.0110	532.791	871.865
2006*	55.567	323.709	15.854	0.0120	395.142	748.537
2007*	53.315	266.776	6.036	0.0120	326.139	628.270

*data from database „Aggregate balance sheet of water“ Source: SHMI

Comparison of surface water exploitation between 1997 and 2007



85 %	1 Industry	82 %
9 %	2 Public Water-suppl.	16 %
6 %	3 Irrigation	2 %

Source: SHMI

♦ **Surface water quality**

At present, Slovakia is undergoing changes in surface water assessment, pursuant to the provisions of framework Directive on Water No. 2000/60/EC. In the past, the STN 75 7221 „Water quality. Surface water quality classification“ norm used as the primary reference in assessing water quality by the Slovak Institute of Technical Normalisation, was invalidated as of 01.03.2007.

Surface water quality is assessed primarily through biological indicators such as macro-zoo-benthos, phyto-zoo-bentos, fishes, and macrophytes. Supporting elements in **ecological state water assessment** include physical-chemical and hydro-morphological quality elements, expressed by **five quality categories** (from very good to very bad). Priority chemicals water concentrations define the situation in water chemistry expressed through only **two quality categories:** good/bad. The worse of the two states (ecological or chemical) shows the resulting water situation and determines other activities that relate to reaching the environmental goal by WFD – to attain good water quality for all water bodies by 2015.

Surface water quality assessment has been carried out on the basis of data obtained during the water level monitoring process. For the year 2007, surface water quality monitoring was split into the basic monitoring, operational monitoring, and monitoring of protected territories (PT). This division followed the provisions of **the MoE SR Resolution No. 221/2005 Coll. which sets forth details on detecting the occurrence and assessment of surface and ground water situation, its monitoring, keeping the water register and water balance records.** Surface water quality activities were carried out under the Water Situation Monitoring Programme in 2007. The Programme involved 124 abstraction sites in the catchments of Danube, Váh, Hron, Bodrog, Hornád, Dunajec, and Poprad. Surface water quality was assessed in the length of 4 314 km.

Number of monitored surface water sampling sites in 2007

Catchment	Sampling site		Monitored length
	Basic	Special	(km)
Danube catchments area	20	-	509.8
Váh catchments area	39	-	1 420.8
Hron catchments area	25	-	975.0
Bodrog catchments area and Hornád catchments area	36	-	1 248.9
Poprad and Dunajec catchment area	4	-	159.5
Total	**124**	**-**	**4 314.0**

Source: SHMI

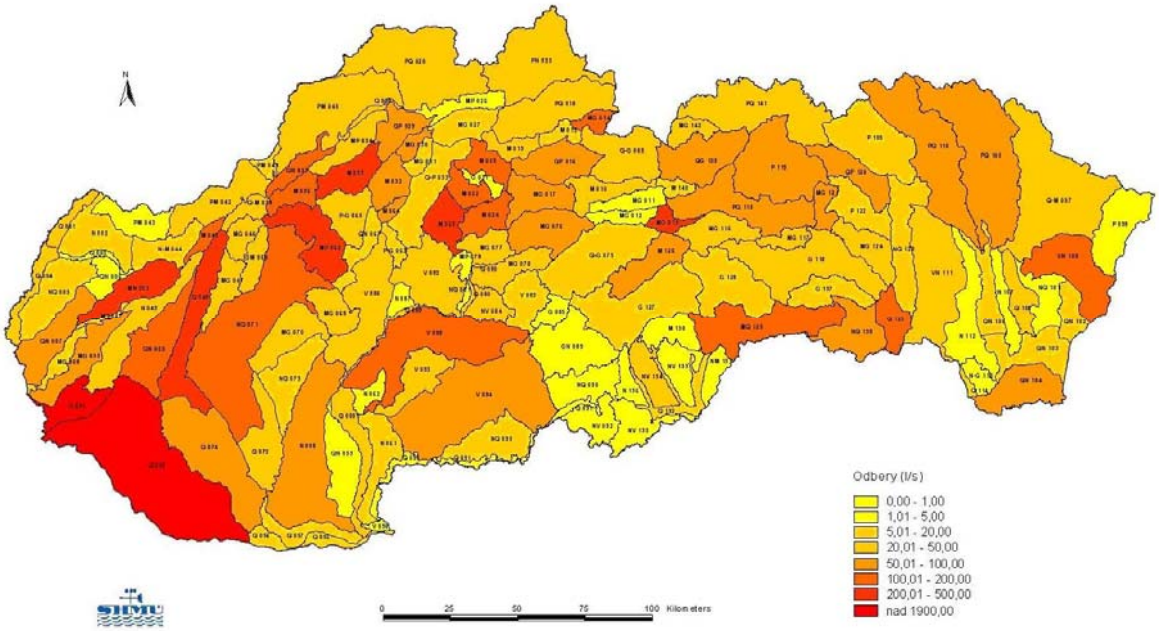
Indicators were monitored within this transitional period that are pursuant to the **SR Government Regulation No. 296/2005 Coll. which introduces requirements on the quality and qualitative goals for surface water, as well as the limit indicator values for wastewater and special water contamination.** General requirements for surface water quality (Annex 1) pursuant to the SR Government Resolution 296/2005 Coll. were fully complied with for the following physical-chemical indicators: total organic carbon, calcium, sulphates, magnesium, as well as micro pollutants that include tensides, cyanides, copper, nickel, chromium, and a various specific organic substances. Indicators with most exceeded values included aluminium and selenium with 100 % occurrence of excessive values. Other frequently exceeded values included AOX and chlorophorm. Values for faecal streptococci, thermo-tolerant and coliform bacteria as part of the microbiological indicators were frequently exceeded. Tetra chloromethane and 1,1,2- Trichloroethylene were not assessed since the set threshold was higher than the limit in NV No. 296/2005 Coll. Despite this, 14 sampling sites showed 1,1,2-Trichloroethylene values higher than the set threshold, therefore exceeding the NV limit 296/2005 Coll. Cis 1,2 – dichloroethene was assessed as complying with the provision of NV 296/2005 Coll. in case that there are only values detected below the set threshold which is 0,1 higher than the value under NV 296/2005 Coll. When the detected values were beyond the set threshold, the indicator was regarded as non-compliant with NV 296/2005 Coll.

Ground water

- **Water resources**

In 2007, based on the hydro-geological assessment and surveys in Slovakia, there were **76 830 l.s^{-1} available groundwater resources**. In comparison with the previous year 2006, there was observed a slight increase of the efficient groundwater volume by 82 l.s^{-1}, i.e. by 0.11 %. In the long-term evaluation, the increase of the efficient volume in comparison with 1990 makes 2,055 l.s^{-1}, i.e. 2.7 %.

Efficient groundwater volumes in the hydrogeological regions in 2006 ($l.s^{-1}$)



Source: SHMI

On the basis of assessment of water management balance expressed by the balance status (proportion of abstractable volumes/abstractions), which is the indicator that shows the rate of wate sources abstraction, we see that in **2007, out of total number of 141 hydro-geological regions in SR, 122 regions show good balance status, 19 regions show acceptable status.** Tensed, critical and emergency balancing state did not occur in any region.

- **Groundwater levels**

In 2007, highest recorded annual values in ground water levels and spring yields come from the period of January through March. In the catchments of Hornád, the autumn non-typical precipitation figures impacted the raising ground water levels with maximum annual recorded ground water values in the course of October. Minimal ground water levels and spring yields were recorded mainly during the winter season in November and December, and during September through October for the springs alone minimal yields persisted until February as well as in September through October.

- **Gabčíkovo interest area**

In 2007, precipitation figures at Žitný ostrov were slightly above the long-term annual average figures. At Bratislava and Veľký Meder, these exceeded also average annual figures for the period of the Gabčíkovo Hydro-electric plant operation. The highest monthly totals were shown at all stations in September, which together with annual maximum Danube levels caused also increased ground water levels. Lowest monthly rainfall totals detected in the whole Žitný ostrov were in April.

♦ **Groundwater abstraction**

In 2007 there was being **extracted 11.366 l.s^{-1} of ground water in average** by the users (which are subjects to reporting obligation) in Slovakia that was 14.8 % of the documented efficient volume. During the year 2007 the groundwater extractions slightly decreased by 299.2 l.s^{-1} which means 2.6 % in comparison with year 2006.

Groundwater extraction in 2006 according to the purpose of use

Year	Public water supplies	Food-processing industry	Industry excl. Food-processing	Agricult. and Livestock	Vegetable prod. Irrigation	Social purposes	Others	Total
2004	9 431.53	322.04	901.65	320.51	65.17	327.02	832.93	12 200.85
2005	9 159.87	288.25	856.75	308.82	95.07	279.72	878.98	11 867.46
2006	8 836.13	295.62	852.34	275.80	94.96	340.15	970.20	11 665.20
2007	8 441.59	383.87	891.32	267.84	146.25	333.44	901.65	11 365.96

Source: SHMI

♦ **Groundwater quality**

Pursuant to the WFD requirements, the older system of dividing Slovakia into significant water management areas was abandoned. Since 2007, classification has been based on delineation of groundwater formations. Monitoring of ground water chemical situation has been divided into:

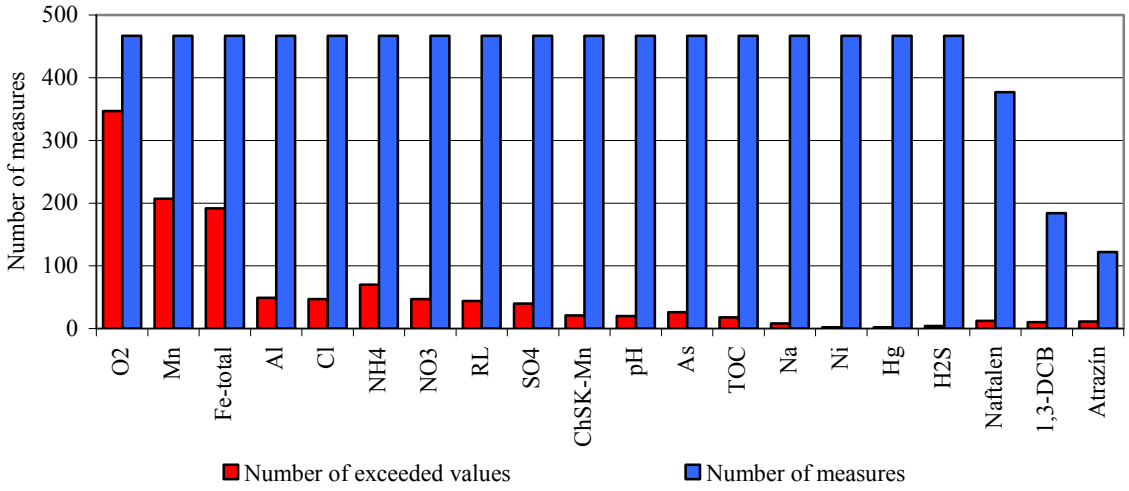
- basic monitoring,
- operation monitoring.

In 2007, ground water quality was monitored at 130 basic monitoring facilities. Ground water samples were taken 1-time in the Autumn for a selected group of indicators.

The results of the analyses were evaluated according to the SR Government Resolution No. 354/2006 Coll. about the requirements for the drinking water and the drinking water quality control, by comparing the measured and limit values for all analyzed indicators.

Adverse **oxidation-reduction** conditions dominate at ground water **basic monitoring** facilities, apparently caused by most frequent occurrences of exceeded acceptable concentrations of total Fe (31 times), Mn (31 times), and NH_4^+ (8 times). Besides these indicators, there has been an untypical event of exceeded concentrations in the group of **physical - chemical indicators,** specifically in the case of the Cl^-, SO_4^{2-}, and NO_3^- anions. Most frequently recorded excessive concentrations in **trace elements** included Al (25 times), As (4 times), Pb (2 times), and Sb (1 time). Contamination by **specific organic substances** shows only local character and the majority of specific organic substances was recorded below the detection limit.

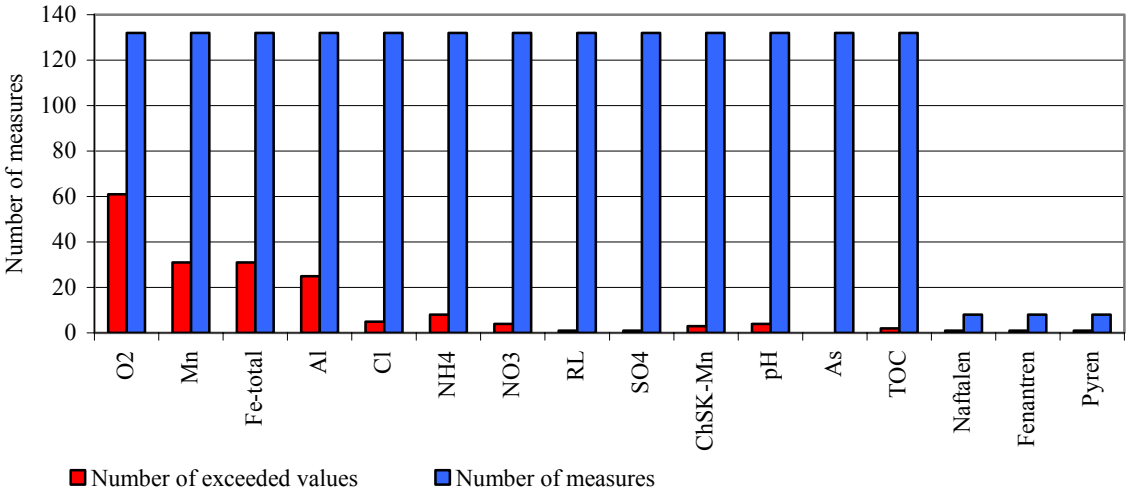
Occurrence of exceeded indicators at basic monitoring facilities pursuant to the SR Government Directive 354/2006 Coll. in 2007



Source: SHMI

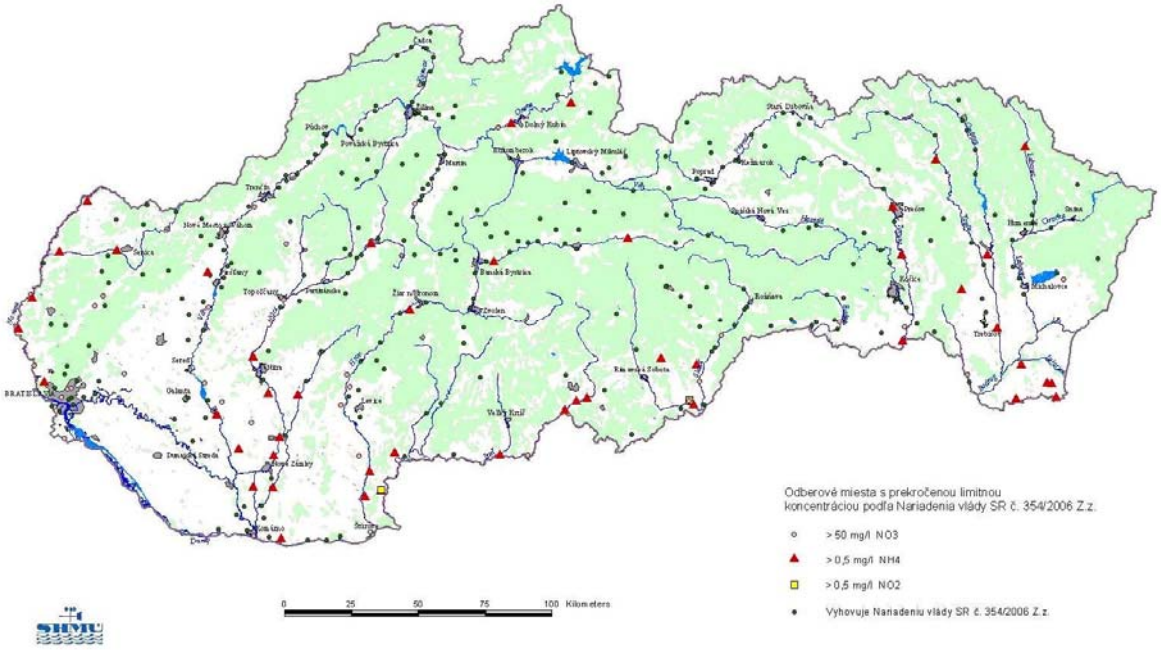
Ground water at **operation monitoring** is relatively low in oxygen, with the exception of the Žitný ostrov area. This is also apparent from the fact that the recommended percentage value for oxygen water saturation was reached only in 26 % of the samples. Most frequently exceeded indicators include Mn and total Fe, which suggests persisting adverse **oxidation-reduction situations.** Exceeded Cl^- and SO_4^{2-} limit values also indicate the impact of anthropogenic pollution on ground water quality. Character of land use (agricultural exploitation) is reflected into increased contents of oxidized and reduced nitrogen forms in ground water, with ammonia ions NH_4^+ (70 times) and NO_3^- (47 times) being the most prevalent. In 2007, the acceptable value set by legislation was exceeded in 5 **trace elements** (Al, As, Sb, Ni, and Hg) at operation monitoring facilities. Most frequently recorded increased contents include Al (49 times) and As (26 times). Presence of **specific organic substances** in ground water indicates impact by human activities. In 2007, operation monitoring facilities detected a wider range of specific organic substances. Most cases involved exceeded limit values in case of indicators from the group of poly-aromatic hydrocarbons (phenanthrene, fluoranthene, benzo(a)pyrene, pyrene) and the group of volatile aromatic hydrocarbons (1,3 dichlorobenzene, 1,4-dichlorobenzene, and 1,2-dichlorobenzene). Limit values for pesticides and volatile aliphatic hydrocarbons were exceeded only sporadically.

Occurrence of exceeded indicators at operation monitoring facilities pursuant to the SR Government Directive 354/2006 Coll. in 2007



Source: SHMI

Groundwater quality in Slovakia in 2007 – concentration NH_4, NO_2, NO_3



Source: SHMI

Waste Water

In 2007 there was discharged 634 419 thousands m^3 of the **waste water** into the Slovak watercourses, which meant the decrease by 99 686 thousands.m^3 (13.6 %) in comparison with year 2006 and 474 119 thousand.m^3 (42.8 %) less in comparison with year 1997.

Reduction in waste water load remained also for the selected indicators of contamination, most markedly seen in chemical oxygen balance by dichromate, by 4 650 tons/year, compared to 2006. For the other indicators, the reduction was less dramatic: insoluble substances (IS) by 1 795 tons/year, biochemical oxygen demand by 2 505 tons/year and indicator ENP_{uv} increase by 14 tons/year.

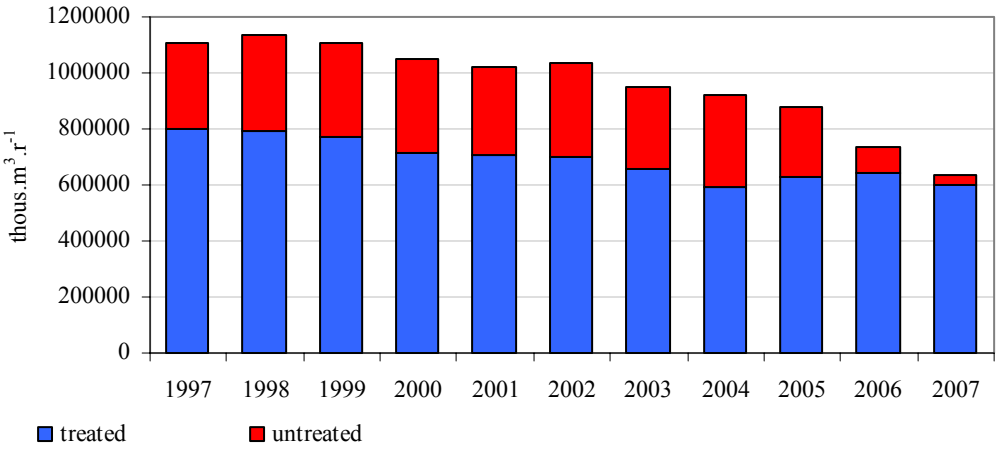
Percentage of discharged treated waste water to **total volumes of waste water** discharged into watercourses in 2007 was 94.05 %.

Load of the balanced contamination sources discharged into surface watercourses in the period of years 1997-2007

Discharged waste water	Volume (thous.$m^3.y^{-1}$)	IS ($t.y^{-1}$)	BOD_5 ($t.y^{-1}$)	COD_{Cr} ($t.y^{-1}$)	ENP_{uv} ($t.y^{-1}$)
1997	1 108 538	37 006	22 601	68 871	565
2004	919 869	21 389	13 702	45 162	57
2005	881 946	12 670	10 661	37 312	55
2006	733 594	11 200	9 026	31 563	44
2007	634 419	9 405	6 521	26 913	58

Source: SHMI

Trend in discharging of the treated and untreated waste waters into watercourses in the period of 1997-2007



Source: SHMI

Proportion of waste water treatment in specific parameters of Directive 91/271//EEC

Category	< 2000 EO	2001 – 10 000 EO	10 001 – 15 000 EO	15 001 – 150 000 EO	> 150 001 EO	Average
COD_{Cr}	78.2 %	91.5 %	90.0 %	90.4 %	66.7 %	**85.37 %**
BOD_5	64.1 %	78.0 %	80.0 %	76.9 %	66.7 %	**72.20 %**
IS	73.1 %	91.5 %	80.0 %	88.5 %	66.7 %	**82.44 %**
N_{total}	-	-	20.0 %	19.2 %	33.3 %	**20.59 %**
P_{total}	-	-	10.0 %	23.1 %	50.0 %	**23.53 %**

Source: WRI

Mentioned values show that the level of treatment in the smallest agglomerations that are not so demanding in terms of the depth of purification is relatively poor, and the ratio of acceptable waste water treatment plants to all plants is little below three quarters. Medium and large size waste water treatment plants remove organic contamination with good efficiency; however, they stay behind in their capacity to remove nutrients. In fact, the largest waste water treatment plants show several cases of overload, when they are not able to remove all received contaminants. This, in turn, is reflected in a lower proportion of acceptable parameters of basic organic contamination.

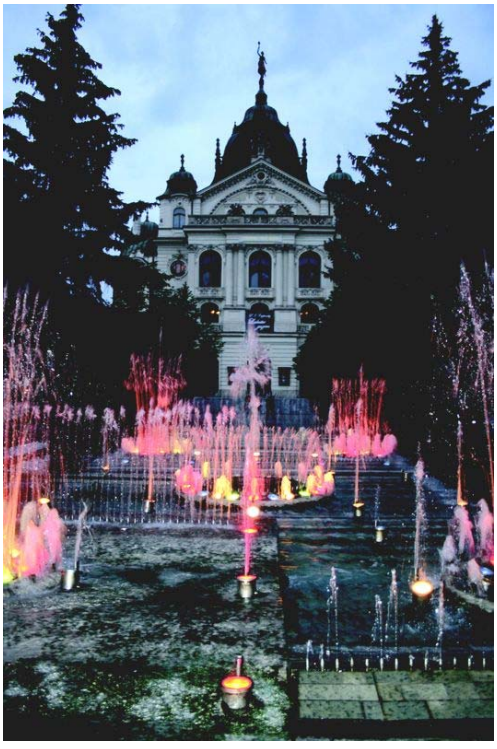
Public water supply, sewerage systems and waste water treatment plants

- **Public water supplies**

Number of inhabitants supplied with drinking water from the public water supply in 2006, reached the number of 4 679 thousand, which represented 86.6 % of supplied inhabitants. There were in the SR 2 353 individual municipalities that were supplied with public water supply, and their portion on total SR municipalities was 81.4 %.

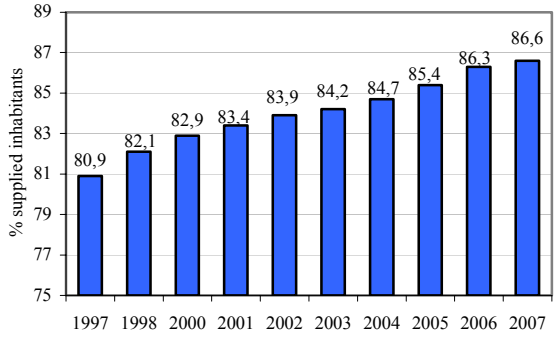
In 2007, there was a marked increase in the percentage of supplied municipalities in the regions of Banská Bystrica (78.5 %), Prešov (62.9 %), and Košice (71.6 %). On the other hand, regions with number of municipalities with public water supplies unchanged since 2006 included Bratislava, Trenčín, Žilina, with percentage from 93 % to 99 %.

Henceforth there persisted the long-term decrease in the drinking water demand. **The volume of the produced drinking water** reached in year 2007 the value of 322 mil. m^3 of the drinking water, which is the decrease in comparison with year 2006 by 12 mil. m^3. From the ground water resources there were produced 271 mil. m^3 (84 %) and from the surface water resources 51 mil. m^3 (16 %) of the drinking water. **Water losses** in the pipe system represented in year 2007 27.1 % from the total water produced in the water management facilities. **Specific water consumption in households** in year 2007 was 107.34 $l.inh^{-1}.day^{-1}$.



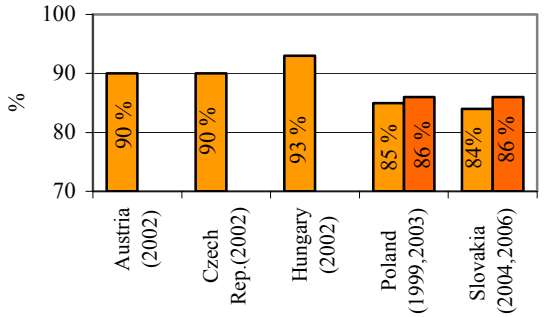
Also other countries showed a decreasing trend in the annual water consumption from public water supplies per capita. Czech Republic and Slovakia are approximately at the same level in terms of water consumption, while Poland shows the least consumption – only 57 $m^3.inhab^{-1}.year$, Hungary shows the best characteristics with having as much as 93 % of its inhabitants supplied with drinking water from public water supplies.

Drinking water supplying of the inhabitants from the public water supplying in the SR



Source: SO SR

Comparison of the drinking water supplying of the inhabitants from the public water supplying in selected countries



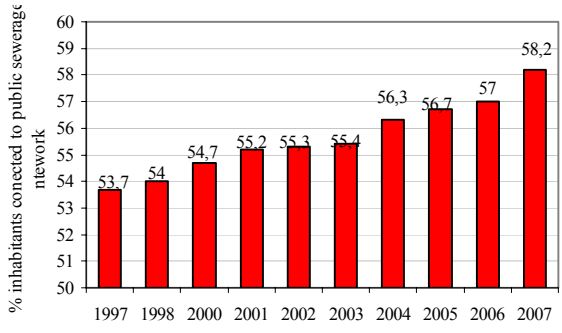
Source: OECD, SO SR

♦ **Sewerage system**

Development of public sewerage systems lags behind that of public water supplies. **Number of inhabitants** living in households **connected to public sewerage systems** in 2007 grew by 45 thousand and reached the number of 3 146 thous. inhabitants, which is 58.2 % of all inhabitants. Of the number of 2 891 of stand-alone municipalities in 2007, 688 of them had public sewerage systems in place (i.e. 23.8 % of all Slovak municipalities), while 568 municipalities (i.e. 19.6 % of all Slovak municipalities) had their wastewater sent directly off to the wastewater treatment plant. Adverse situation remains also in individual regions of Nitra, Trnava, and Prešov, these regions stay behind the national average.

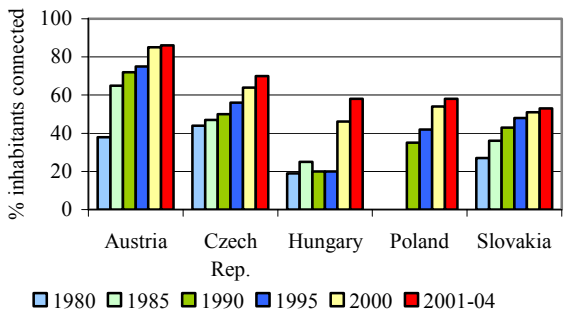
Greatest level of connectedness of the public to the public sewerage system from among the V4 countries reached Austria (86 %), and the Czech Republic (70 %), Poland, Hungary, and Slovakia show approximately the same level of connectedness, 56 % on average.

Connecting of the inhabitants to the public sewerage network in the SR (%)



Source: SO SR

Comparison of the connecting of the inhabitants to the public sewerage network in the selected countries (%)



Source: OECD

♦ **Waste water treatment plants**

In 2007, 46 waste water treatment plants were added into the Administration of water supplies and water sewerage systems (VaK) scheme, reaching the number of 500. Greatest share on these had mechanical-biological WWTPs (84.2 %). Increase in WWTP's capacity was still on the rise, reaching the value of 2 233.6 $m^3.day^{-1}$ in 2007.

In 2007, watercourses with public sewerage system (administered by municipalities and water management companies) received 414 mil.m^3 of discharged waste water, which was by 45 mil.m^3 less than in the previous year, and the volume of treated waste water discharged into the public sewerage system reached 405 mil.m^3.

Volume of the discharged wastewater by the public sewerage system (in administration of VaK and in administration of the municipalities) in 2007

Water discharged by the public sewerage and WWTP	Sewage	Industrial and other	Precipitation	Separate	Administration of the municipalities	Total
	(thous.$m^3.year^{-1}$)					
Treated	114 607	104 829	45 363	129 798	11 185	405 782
Untreated	2 020	916	1 404	2 609	1 376	8 325
Total	**116 627**	**105 745**	**46 767**	**132 407**	**12 561**	**414 107**

Source: WRI

In 2007, there were 55 305 tons of the sludge dry matter produced in municipal WWTPs. Of this, 42 315 tons (76.5 %) were used for soil processes, 9 400 tons (17.0 %) were temporarily stored, and 3 590 tons were landfilled (6.5 %). In 2007, there was direct application of sludge into the agricultural soil. 37 220 tons of sludge dry matter was used for compost production, while 5 095 tons of sludge were used for soil processes (reclamation of landfills, areas, etc.)

Sludge produced in the waste water treatment plant

Year	Amount of the sludge (tons of dry residue)							
	Total	Used			Disposed			
		Applied into the agricultural soil	Applied into the forest soil	Composted and used in other way	Incine-rated	Land filled		In other way
						Total	Suitable for the further use	
2003	54 340	16 640	605	22 085	0	8 110	7 610	6 900
2004	53 085	12 067	0	30 437	0	4 723	3 470	5 858
2005	56 360	5 870	0	33 250	0	8 530	6 960	8 710
2006	54 780	0	0	39 405	0	9 245	8 905	6 130
2007	55 305	0	0	42 315	0	3 590	583	9 400

Source: WRI

Drinking water

♦ **Drinking water quality monitoring and assessment**

As from June 1, 2006, new **SR Government Resolution No. 354/2006 Coll**. came into effect, which sets forth criteria for water for human consumption and control thereof, and which has lead to

minor changes to drinking water quality criteria and assessment criteria (e.g. saprophytic molds were left out of the range of microbiological and biological indicators).

In 2007, radiological indicators were determined in accordance with the SR Government Resolution No. 354/2006 Coll.

Water quality was assessed on the basis of the number or proportion of individual limits shown to have exceeded the pertinent sanitary norms. In 2007, were analysed at operation laboratories of water management companies 8 962 samples. The samples were abstracted at sites located within distribution networks and 240 909 analyses were carried out to monitor individual drinking water quality indicators. Share of drinking water analyses that complied with the sanitary limits in 2007 reached 99.32 % (in 2006 it was 99.44 %). Percentage of samples that meet drinking water quality demands for all indicators reached 89.78 % (in 2006 it was 91.18 %). These samples did not include the active chlorine indicator, as this test was done separately, in relation to the microbiological quality of drinking water.

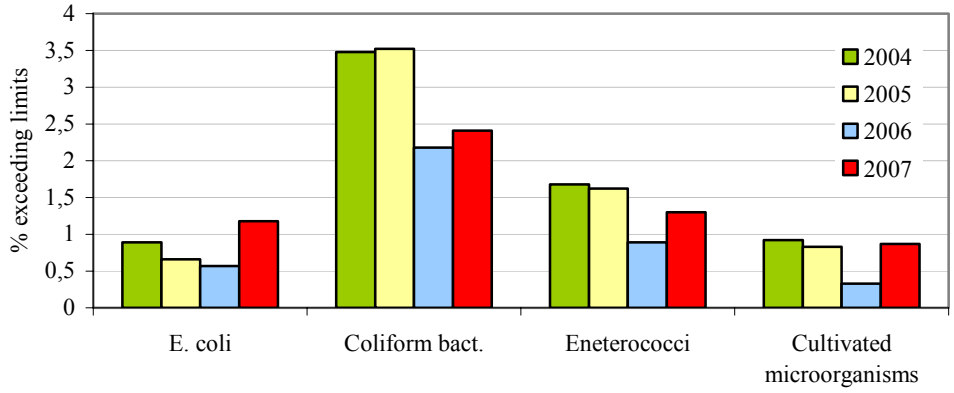
Exceeding limits in drinking water samples in accordance with the Regulation MoH SR No. 151/2004 Coll. on demands on drinking water and drinking water control

Year	2005	2006	2007
Share of drinking water samples that do not meet the NMH and MHRR limit.	2.10 %	1.32 %	2.03 %
Share of drinking water quality indicators analyses that do not meet NMH and MHRR	0.55 %	0.32 %	2.46 %
Share of drinking water samples that do not meet the MH, NMH, MHRR and IH limit.	19.29 %	17.84 %	-
Share of drinking water indicator analyses that do not meet the MH, NMH, MHRR, and IH limits, pursuant to STN 75 711.	1.15 %	1.05 %	-

Source: WRI

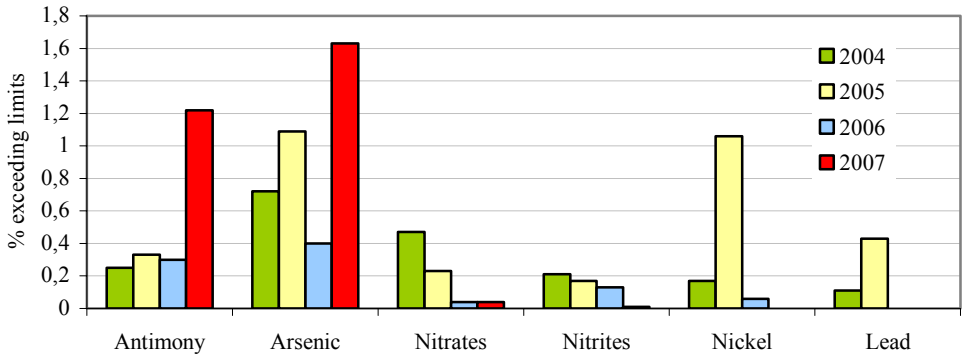
IH – indicative values, MH - threshold values, NMH - maximum threshold values, MHRR – threshold values of the reference risk

Results of monitoring the microbiological and biological indicators of drinking water within Slovakia's distribution networks



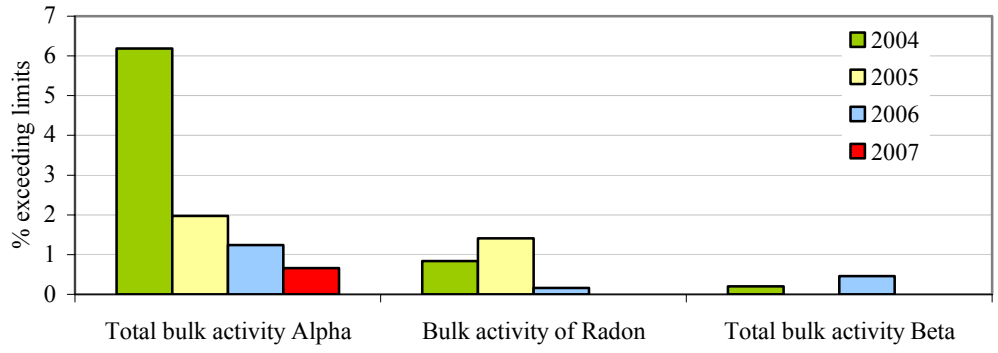
Source: WRI

Results of physical and chemical drinking water indicators monitoring within Slovakia's distribution networks - inorganic indicators



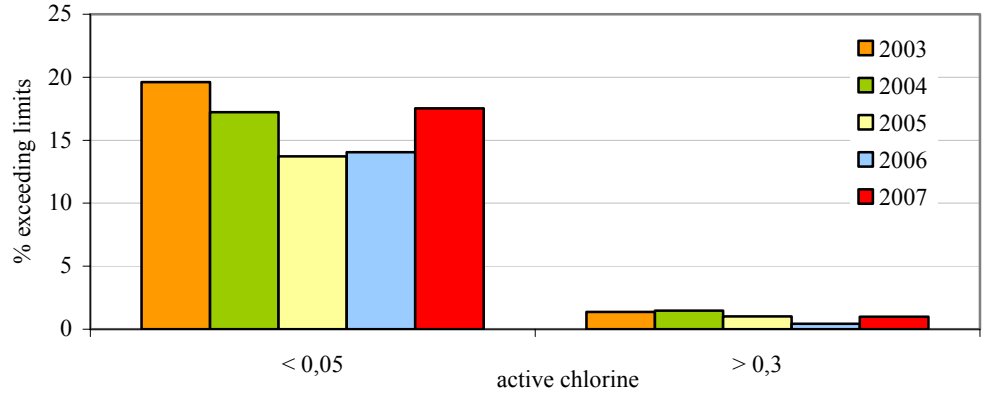
Source: WRI

Results of monitoring for the presence of radiological indicators in drinking water within Slovakia's distribution networks



Source: WRI

Results of monitoring for the presence of disinfection agents and their by-products in drinking water within Slovakia's distribution networks



Source: WRI

Quality of recreational water in 2007

Slovak government established a competency to monitor water designated for recreational use through its **Act 126/2006 Coll. on public health and on amendments of some laws, as well as through the SR Government Resolution 252/2006 Coll. on details regarding the operation of swimming areas, water suitable for swimming, and its control.** The commissioned, competent authorities include PHI SR (Public Health Institute of the Slovak Republic), and regional PHI in SR, along with operators of individual sites, that are to follow the frequency and methods in line with the Directive 76/160/EEC. Since September 2007, this issue has been addressed by a new **Act 355/2007 Coll. on protection, promotion and development of public health and on amendment to other laws.**

Out of 72 natural sites in Slovakia, there are 38 sites with declared water suitable for recreation use with regular monitoring. 21 of these have organized recreation operation with issued permits to operate, with the operator being responsible for quality of the operation and water quality. Sporadic recreational water quality controls were also carried out at sites with so-called non-organized recreation operation, always in the beginning and during the season as scheduled.

Over the season, 380 water samples were extracted in Slovakia and 4 621 tests were done on chemical, physical, microbiological, and biological water quality indicators. 166 analyses exceeded the national limit values. Most frequent cause for insufficient water quality included changes in transparency, in dissolved oxygen, colour, while the limit values for microbiological indicators – coliform bacteria and enterococci were exceeded in less degree. In comparison with the previous years, the occurrence of blue-green algae over the monitored time period was generally lower, in most cases below the limit values.

The SR report on the quality of water for recreational use in 2006 was developed on the basis of article 13 of Resolution 76/160/EEC on quality of water suitable for recrational use. For 2007, the report included 38 swimming areas, 76.3 % of which complied with more stringent water quality criteria. 86.8 % of swimming areas complied with the minimum standards, while 7.9 % did not. Swimming was prohibited in 5.3 %.

The purpose of this law is to establish the principles ***of protection and rational exploitation of mineral resources,*** *especially by carrying out geological researches, openings, preparation and breaking of mineral deposits, enrichment and refining of minerals, performed in relation with their extraction, as well as providing for security of operations and environment protections during these operations.*

§ 1 of the Act on Protection and Exploitation of the Mineral Resources No. 44/1988 Coll. (Mining Act) as subsequently amended

• ROCKS

Geological environmental factors

Partial Monitoring System - Geological Factors (PMS - GF) as part of environmental monitoring in Slovakia, is focused mainly on so-called geological hazards or harmful natural or anthropogenic geological processes that threaten the natural environment and eventually the humans.

From 1.1.2006 data are monitored:

01: Landslides and other slope deformation

02: Tectonic and seismic activity of the territory

03: Anthropogenic sediments of environmental loads sediments

04: Influence of mineral exploitation upon environment

05: Monitoring of the volume activity of Radon in the geological environment

06: Stability of massifs underlying historic objects

07: Monitoring of stream sediments

08: Volume unstable soils

Summary of the major outcomes from the monitoring activities in 2007:

In 2007, monitoring of three basic types of **slope movements** was carried out – slides, creep, and signs of activated falling movements. Measurements were for in 15 selected sites.

For **tectonic movements** in 2007, movements to the surface of the territory and along faults were monitored. Macro-seismic activity was thoroughly assessed in the territory of northern Slovakia and the adjacent part of Poland. Seismic activity of the Slovak territory was assessed. Operation of the Slovak spatial observing service was launched, taking advantage of global navigation satellite system

equipment. The service carries out monitoring at 21 geodetic points. On of these points is in Gánovce and is part of the European monitoring system. In 2007, movements along faults were monitored at these 7 sites: Košický Klečenov, Branisko, Demänovská cave of Freedom, Ipeľ, Vyhne, Banská Hodruša, Cave pod Spišskou. Greatest movements were recorded at the Košický Klečenov site, while other sites showed lower speeds of movements or their stabilization. More attention should be given to the Branisko site where the ongoing movements still threaten the tunnel insulation. In 2007, reports from seismic stations supplied for interpretation more than 5 721 tele-seismic, regional, or local seismic phenomena. 62 earthquakes were localised with the epicentre in the focal area of the Slovak Republic. Macro-seismic monitoring in Slovakia did not detect any earthquake in 2007. On March 2, 2007, there was an accident reported at the Nováky site in Slovakia, which was detected by most National seismic station network sites in Slovakia, some local seismic nuclear power plant stations, as well as several stations in the surrounding countries.

In 2007, the following limits for **anthropogenic sediments** were exceeded at the following monitoring stations: chloride limits (Myjava, Nové Mesto nad Váhom, Šulekovo), cyanides and crude oil products (Prakovce, Devínska Nová Ves, Šaľa), as well as contents of As, Cu, Sb, Pb, Zn, Ni, Ba (Halňa), Fe, and ammonia ions (Šulekovo).

Attention within the process of **environmental impact assessment of extraction activities** was directed toward the area of ore deposits of Rudňany, Slovinky, Smolník, Novoveská Huta, Rožňava, and Banská Štiavnica, together with magnesite and talc deposits in Jelšava – Lubeník – Hnúšťa and Košice – Bankov. Monitored areas of brown coal extraction include the area of Handlová – Cígeľ brown coal territory. Works were focused on introducing more precision and frequency to supplement measurements and to find out needs for adjustments to monitoring facilities. Works also dealt with assessment of hydro-geological, geochemical, and engineering-geological aspects.

Monitoring of the **volume activity of radon** in geological layers in 2007 continued at 14 sites distributed all over the whole Slovak territory. Monitoring of soil radon in 2007 were carried out at six sites that showed middle to high radon risk (Bratislava - Vajnory, Banská Bystrica - Podlavice, Košice-KVP, Novoveská Huta, Teplička, and Hnilec). Greatest average annual reduction in radon activity was detected at the Novoveská Huta site – almost by one third for major radon risk assessment parameters. Only the Hnilec site in the extreme radon risk group showed increased values of volume radon activity in soil. In the area of tectonically damaged site of Grajnár, the measurements of radon volume activity were conducted in soil air. Sampling and radon measurement in water was carried out at three springs of the Small Carpathian mountains, on the outskirts of Bratislava - Mária spring, Zbojníčka spring, and Himligárka spring, at Bacúch – spring of Božena Němcová, and at Sivá Brada near Spišské Podhradie – spring of St. Ondrej, spring Oravice near the OZ-1 bore hole, and in Zemplín – the Ladmovce bore hole

- preliv. Middle values in Radon concentration for all monitored springs in 2007 are higher than in the previous years. Variations to volume Radon activity at monitored ground water springs are of seasonal character.

In 2007, **monitoring of stability of rock massifs** below historic objects concentrated on the following sites: Spišský, Strečniansky, Oravský, Uhrovský and Lietavský castles, and castle Devín.

Within **stream sediments monitoring** exceeding the C category was detected (exceeding of this limit suggests impact of demolition activities) at Nitra - Chalmová (Hg), Štiavnica - river mouth (Pb), and Hornád - Kolinovce (Hg) sites. Snow solutions of most acidic character (with pH values around 4.4) were detected at the following sites: Starý Hrozenkov, Branisko, Donovaly, and Ľupčianska valley. As for the trace elements content, most prevalent in snow solutions in winter season are aluminium, nickel, and zinc.

Volume activity is shown either by reduced soil volume, known as sagging, or increased volume, known as swelling. In 2007, third phase of registration of impaired objects in the Východoslovenská lowland was carried out. Of total number of 950 registered objects in 71 municipalities, 16 most impaired objects were selected in 9 municipalities.

Geothermal energy

Regional **geothermal survey** was conducted in line with the approved Strategy of geothermal energy use in Slovakia by the end of 2007, which involved the following territories: Liptovská basin, Popradská basin, skorušinská plane, sites in Galanta, structures in Ďurkov, Žiarska basin, Hornonitrianská basin, Topoľčany záliv, and the Humenský ridge. At present, hydrogeothermal assessment of the Rimavská basin is underway.

Register of geological mapping

Registers of geological mapping (as of December 31, 2007)

Registers of	Accumulation in 2007	Total number
Surveyed territories	47	514
Surveyed territories drafts	97	517
Landslides	11	11 406
Wells	3 048	738 205
Hydro-geological wells	333	23 314
Landfills	4	8 454
Map drawing and purpose mapping	81	9 698
Geophysical mapping	178	4 628
Abandoned mining works	7	16 576

Source: SGI DS

Abandoned mining works

Pursuant to **Act No. 44/1988 Coll. on protection and exploitation of mineral deposits (Mining Act),** as amended, MoE SR also ensures searching for abandoned mining works. The State Geological Institute of Dionýz Štúr in Bratislava was commissioned to maintain the Register.

Abandoned mining works as of December 31, 2007

Type of abandoned mine	Number
Mining shaft	4873
Pit (hole)	517
Chute	65
Cut, excavation	88
Pingo	3 987
Pingo field	109
Pingo draw	128
Dump	6 125
Old randing	205
Sink mark	293
Placer	20
Tailings dump	10
Other	155
Total	**16 576**

Source: SGI DS

Survey territories

Under the geology legislation and pursuant to the GS SR status - the GEOFOND department keeps the register of survey areas for selected geological activities. In 2007, there were 47 survey areas and 85 registered proposals to designate a survey area. As of December 31, 2007, there were 132 recognised areas.

Overview of deposits in Slovakia

Energy deposits (state to the date 31st December 2007)

Source: SGI DS

Raw material	Number of deposits included into balance	Number of free balance deposits	Number of deposits for mining	Unit	Balance deposits free	Geological deposits
Anthracite	1	1	0	thous. t	2 008	8 006
Bitumen sediments	1	1	0	thous. t	9 780	10 797
Brown coal	11	6	4	thous. t	141 601	464 718
Flammable natural gas – gasoline gas	8	6	1	thous. t	201	398
Lignite	8	3	1	thous. t	112 221	619 790
Non-resinous gases	1	0	0	mil. m^3	0	6 380
Underground stores of natural gas	8	0	1	mil. m^3	0	1 790
Crude oil non-paraffinic	3	3	0	thous. t	1 632	3 422
Crude oil - semi-paraffinic	8	4	4	thous. t	140	6 413
Uranium ores	2	1	0	thous. t	1 396	5 272
Natural gas	39	22	14	mil. m^3	8 744	26 591
Total	**90**	**46**	**25**		**277 716**	**1 153 577**

Ore deposits (state to the date 31st December 2007)

Type of ore	Number of deposits included into balance	Number of free balance deposits	Number of deposits for mining in 2005	Unit	Balance deposits free	Geological deposits
Sb ores	9	1	0	thous. t	85	3 276
Complex Fe ores	7	2	0	thous. t	5 751	57 762
Cu ores	10	0	0	thous. t	0	43 916
Hg ores	1	0	0	thous. t	0	2 426
Poly-metallic ores	4	1	0	thous. t	1 623	23 671
Wolfram ores	1	0	0	thous. t	0	2 846
Gold and silver ores	11	4	1	thous. t	26 450	31 930
Fe ores	2	2	1	thous. t	15 049	19 316
Total	**45**	**10**	**2**		**49 848**	**185 143**

Source: SGI DS

Non-metallics deposits (state to the date 31st December 2007)

Source: SGI DS

Raw material	Number of deposits included into balance	Number of free balance deposits	Number of deposits for mining	Unit	Balance deposits free	Geological deposits
Anhydride	7	6	2	thous. t	806 380	1 250 410
Asbestos and aspestos rock	4	1	0	thous. t	1 808	26 905
Baryte	6	2	2	thous. t	9 233	12 683
Bentonite	23	17	8	thous. t	29 182	42 462
Cast basalt	5	5	3	thous. t	22 837	40 012
Decorative rock	23	20	3	thous. m3	22 196	27 754
Diatomite	3	2	0	thous. t	6 556	8 436
Dolomite	20	20	9	thous. t	609 303	635 770
Precious stones	1	1	0	ct	1 205 168	2 515 866
Graphite	1	0	0	thous. t	0	294
Halloysite	1	0	0	thous. t	0	2 249
Rock salt	4	4	1	thous. t	839 218	1 350 200
Kaolin	14	13	3	thous. t	54 554	59 836
Ceramic clays	38	35	4	thous. t	117 897	192 780
Quartz	7	7	0	thous. t	310	327
Quartzite	15	13	1	thous. t	18 351	26 950
Magnesite	11	6	3	thous. t	750 396	1 164 338
Talc	6	3	0	thous. t	93 709	242 273
Mineralized I - Br waters	2	1	0	thous. m3	3 658	3 658
Pearl stone	5	5	1	thous. t	30 244	30 564
Pyrite	3	0	0	thous. t	0	18 717
Gypsum	6	5	3	thous. t	62 733	93 493
Sialitic raw material	5	5	2	thous. t	109 456	122 819
Glass sands	4	4	2	thous. t	411 424	590 150
Mica	1	1	0	thous. t	14 073	14 073
Building rock	133	128	81	thous. m3	643 071	760 272
Gravel sands and sands	28	26	16	thous. m3	177 914	197 840
Brick clay	42	37	12	thous. m3	111 385	135 579
Techn. usable miner. crystals	3	1	0	thous. t	253	2 103
Limestone – unspecified	30	27	12	thous. t	1 971 214	2 314 973
High-content limestone	10	10	4	thous. t	3 196 102	3 360 024
Zeolite	8	7	2	thous. t	166 097	168 349
Foundry sands	6	6	2	thous. t	106 102	111 326
Refractory clays	14	14	1	thous. t	293 951	508 987
Feldspars	9	6	0	thous. t	3 105	5 487
Total	7	7	0	thous. t	17 658	18 896
	505	**445**	**177**		**11 905 538**	**16 056 855**

Classification of mineral deposits by state of extraction (state to the date 31st December 2007)

Extraction symbol	Characteristics	Number of deposits
1	*Deposits with developed extraction activity* include exclusive mineral deposits sufficiently open and technically apt for extraction of industrial deposit.	**212**
2	*Deposits with fading extraction activity* include extraction mineral deposits where extraction activity will cease in a near future (within 10 years)	**36**
3	*Deposits before completion* include exclusive mineral deposits with documented deposits that give basis to one of the construction phases (starting with the projection phase)	**40**
4	*Deposits with ceased extraction* include exclusive mineral deposits with definitely or temporarily stopped extraction activity.	**99**
5	*Non-extracted deposits* include documented exclusive mineral deposits soon **to be** constructed and extracted.	**60**
6	*Non-extracted deposits* include documented exclusive mineral deposits **with no plans** for their extraction.	**181**
7	*Surveyed deposits* include deposits of exclusive and non-exclusive minerals with various degree of mapping.	**12**

Source: SGI DS

Non-limited mineral deposits (as of December 31, 2007)

Raw material	Number of listed deposit sites	Number of sites with extraction activities
Shale	2	0
Floating sand	1	0
Tailings, waste	7	4
Clays	1	0
Building stone	153	42
Ballast and sand	201	86
Brick raw material	57	1
Tuff	2	0
Dried sludge – brucit	1	1
Total	**425**	**134**

Source: SGI DS

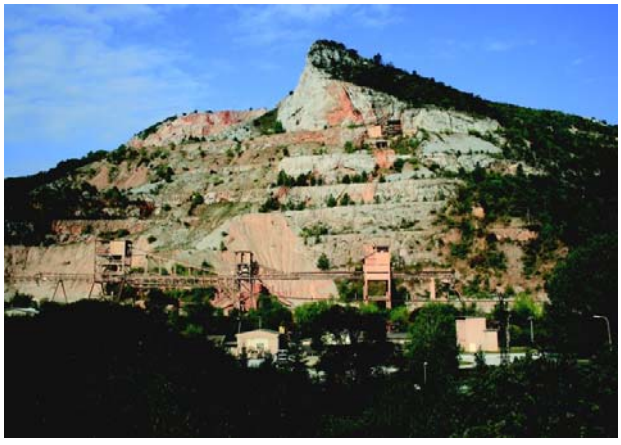
♦ Ground water volumes

Ground waters deposits in the SR (state to the date December 31, 2007)

Category	A	B	C	Total
Efficient deposits of the ground waters (l.s-1)	-	96.06	2 841.10	2 937.16
Efficient amounts of the ground waters (l.s-1)	-	-	9 851.76	9 851.76

Source: SGI DS

Legend:
C calculated on the basis of assessment of the existing hydrogeological mapping
B calculated on the basis of hydrogeological mapping with long-term extraction test
A calculated on the basis of hydrogeological mapping with semi-operational test



The terms sustainable exploitation of the arable land and farming the farmland mean exploitation and protection of the properties and functions of the soil by the means and to the extent, which would keep its biological diversity, fertility, restoration ability and potential to perform all functions.

§ 2 letter e/ of the Act on Protection and Use of Farmland No. 220/2004 Coll., including the change of Act on Integrated Pollution Prevention and Control No. 245/2003 Coll., and on change and amendment of some laws

• SOIL

Land use

♦ **Land Use on the basis of the Land Register's data**

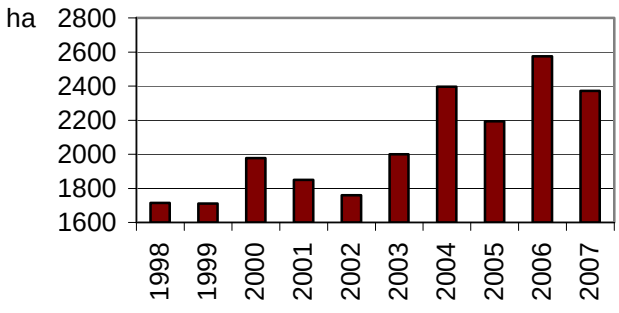
Land Use categories (state to the date 31st December 2007)

Land category	Area (ha)	% of total area
Agricultural land	2 428 899	49.53
Forest land	2 007 142	40.93
Water areas	93 656	1.91
Build-up land	227 931	4.65
Other land	145 945	2.98
Total area	4 903 573	100.00

Source: GCCA SR

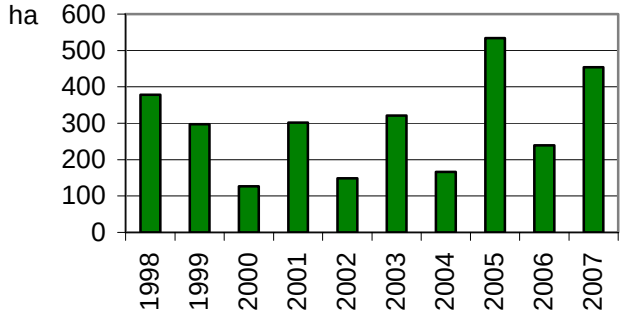
Anthropogenic pressure to use soil for purposes other than its primary production and environmental functions brings about its gradual decrease. In the years 1999-2007, **losses of agricultural soil to construction** grew on the year-year basis, mainly for public, house, and industrial construction purposes (1 398 ha in 2007).

Trend in agricultural soil loss including the losses of arable soil to forestland, non-agricultural and non-forested soil in the SR



Source: GCCA SR

Trend in forestland loss to agricultural soil, non-agricultural and non-forested soil in the SR



Source: GCCA SR

Soil properties

Information on state and trend in agricultural soil properties and their degradation may be obtained from the Partial Monitoring System - Soil (PMS-S) carried out by the Soil Science and Conservation Research Institute (SSCRI) and from the Agrochemical soil testing (AST) carried out by Central Controlling and Testing Institute in Agriculture (CCTIA). Information on state and trend in forest soil properties may be obtained from the Partial Monitoring System – Forests (PMS-F) carried out by the National Forest Centre – Forest Research Institute.

♦ Chemical properties of soil

Soil reaction

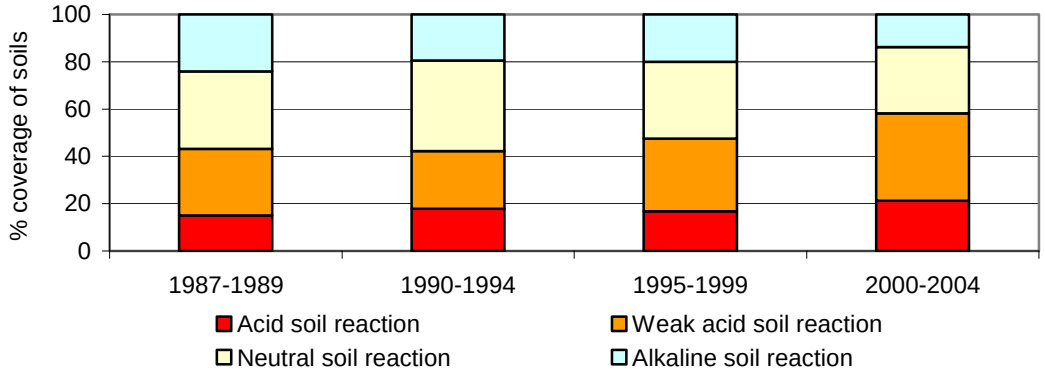
Trend in soil reaction (pH/H_2O) in the A-horizon of agricultural soil in Slovakia, based on the comparison of outcomes from three PMS-S cycles

Main soil unit	1993-1997	1997-2002	2002-2007
Mollic Fluvisols AL	7.29	7.24	7.03
Fluvisols AL	7.13	6.95	6.84
Chernozems AL	7.28	7.31	7.22
Haplic Luvisols AL	6.71	6.85	6.90
Planosols AL	6.66	6.70	6.47
Planosols PG	6.31	6.24	6.13
Rendzic Leptosols AL	7.27	7.25	7.54
Rendzic Leptosols PG	7.17	7.18	6.57
Regosols AL	6.68	6.54	6.95
Cambisols AL	6.56	6.42	6.18
Cambisols PG	5.61	5.56	5.29
Solonchaks and Solonetz PG	8.29	7.88	8.45
Podzols PG	4.21	3.93	3.88

AL – Arable Land, PG – Permanent Grassland Source: SSCRI

Outcomes from agrochemical soil testing for the VIII. (1987-1989) through XI. (2000-2004) cycle show an **increase in the proportion of agricultural soil with acid** (+6.2 %) and **weak acid** (+8.8 %) **soil reaction.** On the other hand, a reduction was seen in the proportion agricultural soil with neutral (-4.7 %) and alkaline (-10.3 %) soil reaction.

Trend in agricultural soil reaction in the SR (in KCl) based on the outcomes from Agrochemical soil testing



Source: CCTIA

Most Slovak forestland is mildly to strongly acidic.

Trend in exchange soil reaction (pH/$CaCl_2$) in forest soil in the SR based on comparison of the PMS-F results

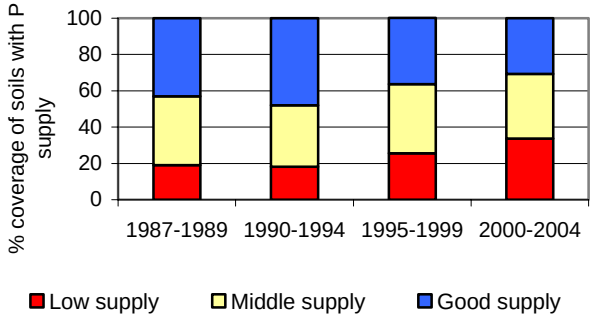
Depth	1988	1993	1998	2006
Upper humic horison	-	4.8	4.7	4.7
0-10 cm	4.2	4.1	4.1	4.1
10-20 cm	-	3.9	4.0	4.0

Source: NFC - FRI

Available nutrients

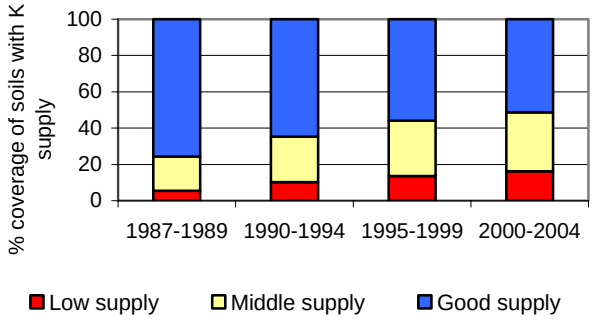
During the period VIII. (1987-1989) through XI. (2000-2004) of Agrochemical soil testing there was an **increase in low supply of all three available nutrients (phosphorus, potassium, and magnesium).** In phosphorus, it was by 14.6 %, by 10.7 % in potassium, and by 5.3 % in magnesium. However; during this period, good supply of all three available nutrients were reduced (by 12.4 % in phosphorus, by 24.2 % in potassium, and by 12 % in magnesium), which, in terms of plant nutrition, is a negative tendency.

Trend in phosphorus content in agricultural soil in the SR based on outcomes of Agrochemical soil testing



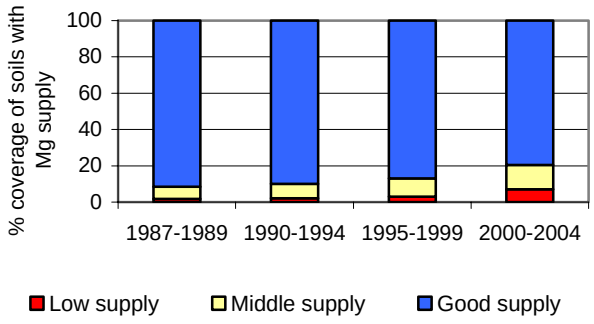
Source: CCTIA

Trend in potassium content in agricultural soil in the SR based on outcomes of Agrochemical soil testing



Source: CCTIA

Trend in magnesium content in agricultural soil in the SR based on outcomes of Agrochemical soil testing



Source: CCTIA

Humus

Trend in humus content in the A-horizon of agricultural soil in the SR, based on the comparison of outcomes from three PMS-S cycles (%)

Main soil unit	1993 - 1997	1997 - 2002	2002 - 2007
Chernozems AL	2.74	2.17	3.12
Mollic Fluvisols AL	3.62	3.10	3.72
Fluvisols AL	2.71	2.24	3.03
Haplic Luvisols AL	2.07	1.72	2.59
Planosols and Luvisols AL	2.05	1.69	2.38
Planosols and Luvisols PG	3.79	3.45	5.12
Cambisols AL	3.05	2.45	3.45
Cambisols PG	5.52	4.14	6.55
Regosols AL	2.07	1.60	2.07
Rendzic Leptosols AL	3.74	2.76	3.14
Rendzic Leptosols PG	5.94	4.32	6.61
Andosols PG	10.91	12.48	16.55
Podzols PG	18.79	20.17	24.79

AL – Arable Land, PG – Permanent Grassland Source: SSCRI

Note: Error in humus setting is app. 10%, i.e. 0.3 % of humus, for this reason, differences lower than 0.3 % may be attributed to analytical setting. In case of permanent grasslands differences between years may be caused by high heterogeneity of humus values between individual sites in the land, especially in case of lands above the upper forest border, and they are not statistically significant.

Changes to values in forest soil humus content in individual extraction cycles are shown in Table.

Trend in humus content in forest soil in the SR based on comparison of the PMS-F results

pth	% of humus		
	1993	1998	2006
Upper humic horizon	51.8	55.3	61.7
0-10 cm	9.55	9.79	8.60
10-20 cm	5.55	6.04	5.27

Source: NFC - FRI

♦ Physical properties of soil

The table shows changes to values of total porosity in the A-horizon of agricultural land during three PMS-S cycles.

Trend in overall porosity in the A-horizon of agricultural soils in the SR, based on the comparison of outcomes from three PMS-S cycles

Main soil unit	Volume %								
	Light soils			Medium heavy soils			Heavy soils		
	1993-97	1997-02	2002-07	1993-97	1997-02	2002-07	1993-97	1997-02	2002-07
Chernozems	-	-	-	51.8	47.3	49.6	45.0	50.7	46.7
Mollic Fluvisols	54.0	46.8	42.3	46.4	49.5	51.4	53.5	48.8	47.3
Fluvisols	45.8	50.3	48.4	47.8	48.4	52.2	47.5	50.8	52.6
Haplic Luvisols	-	-	-	49.8	47.3	48.7	50.5	46.3	51.5
Planosols and Luvisols	-	-	-	46.0	46.8	49.6	50.8	47.6	52.0
Cambisols	32.7	45.5	45.5	40.2	48.3	52.5	51.9	51.6	51.8

Source: SSCRI

Soil degradation

Serious soil degradation includes contamination with heavy metals and organic pollutants, acidification, as well as alkalinization and soil salinization. Recently, soil degradation through desertification grows in significance.

Soil contamination by hazardous substances

Results from the III. cycle of PMS-S with samples extracted in 2002 showed that the contents of the majority of hazardous substances in selected agricultural land of Slovakia are below the limit, especially being the case of arsenic, chromium, copper, nickel, and zinc. In case of cadmium, excessive limit values were recorded only in soils situated in higher altitudes, podzols, andosols, which might relate to remote transfer of emissions (Kobza and coll., 2002).

Hazardous substances (mg.kg^{-1}) in A horizon of selected agricultural soil of the SR (the third PMS-S cycle)

Main soil unit	Hazardous substances in 2 mol.dm^{-3} HNO_3						
	As*	Cd	Cr	Cu	Ni	Pb	Zn
Podzols and Rankers	3.55	0.48	2.24	4.52	0.85	63.61	12.94
Andosols	1.42	0.51	3.32	11.00	1.01	49.72	33.44
Regosols	0.65	0.17	3.31	8.38	1.84	5.31	9.34
Solonchaks and Solonetz	1.03	0.20	4.24	5.84	4.33	11.71	9.49
Cambisols	1.89	0.25	3.08	10.20	3.07	18.88	11.92
Rendzic leptosols	0.69	0.38	3.50	9.10	5.15	20.40	21.55
Mollic Fluvisols	1.45	0.22	3.55	13.05	5.95	16.10	15.55
Planosols and Luvisols	1.73	0.18	2.76	6.99	2.76	5.53	9.88
Planosols	1.70	0.22	2.59	5.59	1.67	16.09	9.16
Haplic Luvisols	1.13	0.14	2.94	10.16	4.8	11.55	9.73
Chernozems	1.11	0.15	2.49	11.49	7.11	11.86	8.92
Fluvisols and Gleyic Fluvisols	3.51	0.25	3.88	15.87	7.47	17.16	20.23
Fluvisols, Gleyic Fluvisols and Gley	2.42	0.63	5.76	16.27	6.35	57.45	41.7

*in 2M HCl

Source: SSCRI

Contents of contaminants in soil in selected cadastre areas are monitored under the Spatial Soil Contamination Survey (PPKP). Within the SSCS 2005, 861 soil samples from 71 agricultural companies were analysed for heavy metal contents. The analysed 861 soil samples represent the area of 3 6345.8 ha in the number of 861 hunts. The mentioned control area showed 1 436.0 ha over the limit, which are 42 hunts.

Overview of controlled areas, number of plots, parameters in SSCS 2005 – sampling year 2004

Name of district	Controlled plots		Parameter	Limit exceeding plots		Limit exceeding parameters
	ha	number		ha	number	
Malacky	1429.0	43	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Pezinok	33.0	6	Pb, Cd, Cr,Ni, Hg, As, Zn	-	-	-
Senec	1 634.0	33	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Galanta	1 191.0	13	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Hlohovec	720.0	15	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Piešťany	153.0	11	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Senica	681.0	19	Pb, Cd, Cr,Ni, Hg, As	56.0	2	Cd, Pb
Bánovce nad Bebravou	1 657.0	53	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Ilava	282.0	8	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Nové Mesto nad Váhom	392.0	13	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Prievidza	760.5	20	Pb, Cd, Cr,Ni, Hg, As, Zn	145.0	5	As
Trenčín	202.0	13	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Komárno	808.0	16	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Levice	613.0	15	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Nitra	1 180.0	17	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Nové Zámky	594.0	14	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Zlaté Moravce	1307.0	20	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Čadca	312.0	17	Pb, Cd, Cr,Ni, Hg, As	12.0	1	Cd
Dolný Kubín	206.2	14	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Liptovský Mikuláš	1 244.0	36	Pb, Cd, Cr,Ni, Hg, As	199.0	6	As, Cd, Cr,
Martin	852.0	38	Pb, Cd, Cr,Ni, Hg, As	51.0	2	Cd-
Ružomberok	306.0	17	Pb, Cd, Cr,Ni, Hg, As	47.0	2	Cd, Ni
Tvrdošín	598.0	21	Pb, Cd, Cr,Ni, Hg, As	93.0	5	Cd
Banská Bystrica	43.0	4	Pb, Cd, Cr,Ni, Hg, As	12.0	2	Cd, Pb
Brezno	99.0	5	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Detva	457.0	18	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Krupina	1 026.8	29	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Lučenec	1 572.7	41	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Revúca	101.1	3	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Rimavská Sobota	704.3	18	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Veľký Krtíš	262.2	9	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Zvolen	417.0	19	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Bardejov	541.0	10	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Humenné	138.0	5	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Levoča	597.0	15	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Medzilaborce	448.0	10	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Poprad	134.0	5	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Prešov	1 679.0	36	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Stará Ľubovňa	489.0	7	Pb, Cd, Cr,Ni, Hg, As	255.0	3	Cd
Stropkov	303.0	12	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Svidník	459.0	13	Pb, Cd, Cr,Ni, Hg, As	41.0	1	Cd
Vranov nad Topľou	855.0	14	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Košice-okolie	3 501.0	35	Pb, Cd, Cr,Ni, Hg, As	130.0	1	Hg
Michalovce	1 677.0	24	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Rožňava	717.0	17	Pb, Cd, Cr,Ni, Hg, As	165.0	7	Hg
Sobrance	2 217.0	24	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Spišská Nová Ves	230.0	5	Pb, Cd, Cr,Ni, Hg, As	230.0	5	Hg
Trebišov	523.0	11	Pb, Cd, Cr,Ni, Hg, As	-	-	-
Total	**36 345.8**	**861**		**1 436.0**	**42**	

Source: CCTIA

In case of forest soil, the most significant effect of their anthropogenic contamination involves accumulation of contaminants in upper humic horizon.

Content of risk elements in upper humic horizon of forest soil determined in aqua regia

Risk element		1993	1998	2006
Lead	Mean	61.8	38.4	30.5
	Maximum	300.4	234.8	180.5
Zinc	Mean	131.6	104.2	83.3
	Maximum	401.0	357.2	258.4
Copper	Mean	24.4	20.9	15.3
	Maximum	299.0	240.3	140.7
Cadmium	Mean	1.13	1.01	0.64
	Maximum	2.99	2.51	1.56

Source: NFC - FRI

Average content of polycyclic aromatic hydrocarbons (PAH) in agricultural soils of the SR in the I. monitoring cycle was around 200 $\mu g.kg^{-1}$, which represents **reference values.** Values beyond 1000 $\mu g.kg^{-1}$ were only of local character (Žiar nad Hronom, Strážske, Danube and Morava river flats).

In the III. monitoring cycle covering 274 agricultural hunts with the size of 15 802 ha, **no excessive limit pollutants (PAU, PCB, chlorinated hydrocarbons) were found in the monitored hunts.**

♦ Physical degradation

Erosion and soil compaction belong among the major phenomena of physical degradation in Slovakia.

Soil erosion

Water erosion is prevalent in Slovakia.

Agricultural land endangered by erosion in the SR

Erosion categories	Water erosion		Wind erosion	
	Land area in ha	% from Agricultural Land	Land area in ha	% from Agricultural Land
No erosion or slightly	1 378 697	56.7	2 277 268	93.6
Medium	227 392	9.3	75 422	3.1
Strong	332 519	13.7	48 660	2.0
Extremely strong	494 371	20.3	31 629	1.3
Total	2 432 979	100	2 432 979	100

Source: SSCRI

Soil compaction

Based on the results of the PMS-S for the years 1993-2002, there was an improving tendency in physical soil properties. This also suggests less dramatic compaction of heavy and medium heavy arable soil types. In case of subsoil, greater proportion of compacted sites was found. Heavy soil types show higher rate of compaction over the whole soil profile.

Desertification

Methodologically, recent soil monitoring process has shown the solution in its initial phase. Slightly observable phenomena have so far been recorded mainly in the south of Slovakia, in some monitored sites.

Application of the sewage sludge and bottom sediments into the soil

Aplying the sewage sludge from waste water treatment plant to agricultural soil and forestland follows the provisions of the SR National Council **Act 188/2003 Coll. on application of sewage sludge and river bed sediments to soil**, **and on amendment to Act 223/2001 Coll. on waste and amendments to certain laws as amended.**

In 2006, the overall sludge production in the SR was 55 305 tons of dry matter. Of this volume, 42 315 tons (76.5 %) were used in soil processes, 9 400 tones were temporarily stored (17.0 %), and 3 590 tons (6.5 %) were landfilled. In 2007, there was **no direct application of waste water treatment sludge into agricultural soil**. 37 220 tons of sludge dry matter was used for compost production, while 5 095 tons of sludge dry matter were used for soil processes (reclamation of landfills, areas, etc.).

*Everybody, while performing an activity, which could endanger, harm or destroy **plants or animals,** or their biotopes, are obliged proceed so that there is no pointless death loss or damage and destruction.*

§ 4 par. 1 of the Act No. 543/2002 Coll. on Nature and Landscape Protection as subsequently amended

• FLORA AND FAUNA

Flora

♦ Endangerment of plant taxons

State of endangered individual plant taxons has been elaborated pursuant to the relevant red lists. Complete *Red list of plants and animals of Slovakia* (In: Ochrana prírody /Nature protection/ vol. 20) was created in 2001.

State of endangerment of plant taxons in 2007

Group	Total number of taxons		Endangered (IUCN cat.)						Ed
	World (global estimation)	Slovakia	EX	CR	EN	VU	LR	DD	
Cyanophytes and Algae	50 000	3 008	-	7	80	196	-	-	-
Lower fungi	80 000	1 295	-	-	-	-	-	-	-
Higher fungi	20 000	2 469	5	7	39	49	87	90	-
Lichens	20 000	1 585	88	140	48	169	114	14	-
Bryophytes	20 000	909	26	95	104	112	85	74	2
Vascular plants	250 000	3 352	77	266	320	430	285	50	220

Source: SNC SR

Legend:
Ed – endemic species

IUCN categories of endangerment:
EX – extinct
CR – critically endangered
EN – endangered
VU – vulnerable
LR – less endangered
DD – data deficient

The basic **reason** of plants endangerment is especially **the destruction of the sites. The most endangered habitats** in Slovakia include: inland salt marshes and salt meadows, Carpathian travertine salt lakes, inland Pannonic sand dunes, alpine and sub-alpine grassland, alpine snow beds, xeric grassland and scrub vegetation on calcareous substrate with species of the *Orchideacae* family, active raised bogs, transition

mires and quaking bogs, Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae,* alkaline fens, petrifying springs with tufa formation.

Comparison of the vascular plant endangerment* in selected countries

	Slovakia	Austria	Hungary	Poland	Czech Rep.
Vascular plants (%)	30.3	33.4	19.8	11.2	42.5

Source: OECD

* Among "endangered" taxons are those taxons classified under categories: CR, EN, and VU under IUCN.
Czech Rep.: Data include extinct species.

♦ **Protection of plant taxons**

Protection of plant taxons is in the presence regulated by the **Resolution of MoE SR No. 24/2003 Coll.** to the *Act on Nature and Landscape Protection No. 543/2002 Coll.* as amended by Resolution 638/2007 Coll. Number of the **state protected taxons** is now **1 418** (vascular plants – 1 285; bryophytes – 47; higher fungi – 70; lichens – 17). There are **823 taxons** occurring in Slovakia (vascular plants – 713, bryophytes – 23, higher fungi – 70, lichens – 17).

Wild-growing plant taxons in Slovakia protected by international conventions and EU regulations (2007)

	Cyanophytes and Algae	Fungi	Lichens	Bryophytes	Vascular plants
In attachment II of **Habitats Directive**	-	-	-	9	40
In attachment IV of **Habitats Directive**	-	-	-	-	42
In attachment I and II of **CITES**	-	-	-	-	110
In attachment I of **Bern Convention**	-	-	-	8	34

Source: SNC SR

There were processed and realized **rescue programmes** for the following species of vascular plants:

Rescue programmes (RP)	Vascular plants species
Processed in 2007	There wasn´t processed RP in 2007.
Realized in 2007	There were realized RP for the following species in 2007: *Orchis coriophora subsp. coriophora, Ophrys holubyana, Drosera anglica, Rhynchosphora alba, Scheuchzeria palustris, Lycopodiella inundata, Pulsatilla zimmermannii, Pulsatilla pratensis subsp. flavescens, Orchis palustris, Orchis elegans, Anacamptis pyramidalis, Carex chordorhiza, Carex pulicaris, Glaux maritima*

Source: SNC SR

Actual problem endangering the diversity of plant species in last years has been becoming **invasive species**. In 2007, **elimination** of invasive plant species was carried out at 50 sites in protected areas of the size of almost 50 ha. This activity followed up on the measures implemented also in the previous years. 14 species

of introduced and invasive plant species were thus eliminated. Outside the protected areas, eliminated were 7 species of invasive plants at 73 sites of the size of 76 ha.

There was observed approximately **175 allochtonous species** of plants in Slovakia, whereof in the presence about **20** species behaves as invasive ones. **The most spread** invasive plant species in our country are *Fallopia japonica, Helianthus tuberosus, Heracleum mantegazzianum, Impatiens parviflora, Solidago canadensis, Fallopia sachalinensis, Impatiens glandulifera, Solidago gigantea, Aster novi-belgii, Aster lanceolatus, Robinia pseudoacacia, Ailanthus altissima, Rudbeckia laciniata.*

Fauna

- **Endangerment of animal species**

State of endangered individual animal taxons has been elaborated pursuant to the relevant red lists.

State of endangerment of the particular invertebrate taxons in 2007

Taxons	Number of taxons		Categories of endangerment (IUCN)							Endangerment total	Endang. %
Group	World	SR	EX	CR	EN	VU	LR	DD	NE		
Mollusca	128 000	277	2	26	22	33	45	8	135	136*	49.1
Aranea	30 000	934	16	73	90	101	97	45	-	422	45.2
Ephemers	2 000	132	-	8	17	16	-	-	-	41	31.1
Odonata	5 667	75	4	-	14	11	13	5	-	47	62.7
Orthoptera	15 000	118	-	6	7	10	20	10	-	53	44.9
Heteroptera	30 000	801	-	14	7	6	4	-	-	31	3.9
Coleoptera	350 000	6 498	2	15	128	490	81	2	-	718	11.1
Hymenoptera	250 000	5 779	-	23	59	203	16	-	-	301	5.2
Lepidoptera	100 000	3 500	6	21	15	41	17	11	-	111	3.2
Diptera	150 000	5 975	-	5	10	71	19	93	-	198	3.3

Source: SNC SR

* without the category of NE

State of endangerment of the particular vertebrate taxons in 2007

Taxons	Number of taxons		Categories of endangerment (IUCN)							Total	%
Group	World [4]	SR	EX	CR	EN	VU	LR	DD	NE		
Lampreys		4	-	4	-	-	-	-	-	4	100.0
Pisces	25 000	79	6	7	8	1	22	2	-	45[1]	57.0
Amphibians	4 950	18	-	-	3	5	10	-	-	18	100.0
Reptiles	7 970	12	-	1	-	4	6	-	-	11	91.6
Birds[2]	9 946	219	2	7	23	19	47	4	19	121	55.3 (35.5[3])
Mammals	4 763	90	2	2	6	12	27	15	4	68	75.6

Source: SNC SR

[1] taxon has two forms listed under two different categories (EX, CR)
[2] only nesting birds – of total number of 341 birds of Slovakia, only the all 219 species of nesting birds were assessed
[3] % of total number of birds 341
[4] Source: UNEP – GBO

IUCN Categories:
EX - extinct taxon
CR - critically endangered taxon
EN - endangered taxon
VU - vulnerable taxon
LR - lower risk taxon
DD - data deficient taxon
NE - non evaluated taxon

Comparison of vertebrates endangerment[1)] in selected countries (%)

	Slovakia	Austria	Hungary	Poland	Czech Rep.	EU*
Invertebrates	5.3	-	> 0.9	5.6	0.3	13.9
Pisces	24.1	41.7	32.1	14.5	29.2	38.1
Amphibians	44.4	100.0	100.0	-	90.0	46.7
Reptiles	38.5	75.0	100.0	33.3	100.0	85.7
Birds	14.4	26.0	18.8	14.5	55.9	100.0
Mammals	22.2	22.0	71.1	15.7	33.3	82.4

Source: OECD

[1)] "endangered" taxons include species under categories: CR, EN, and VU under IUCN
* proportion of globally endangered species according to IUCN, included in the European instruments (EU directives, Bern convention)

Austria) only autochthonous species; invertebrates: insecta, decapoda, mysidacea and mollusca.
Czech Rep.) data refer to autochthonous species and EX including.
Hungary) "Endangered" reptiles and amphibians refer to the protected and highly protected species.

♦ Protection of animal species

Protection of animal species is regulated by the **Resolution of MoE SR No. 24/2003 Coll.**, which implements the *Act on nature and landscape protection No. 543/2002 Coll.* as amended by **Resolution 638/2007 Coll.** The number of **animal taxons under state protection** is now **813 taxons** on the level of species and subspecies and to **12 taxons** on the level of genus.

Animal wildlife in Slovakia protected by international conventions and EU regulations (2007)

	Invertebrates	Pisces	Amphibians	Reptiles	Birds	Mammals
In annex II of **Habitats Directive**	53	23	5	1	-	22
In annex IV of **Habitats Directive**	50	1	10	9	-	46
In annex I of **Birds Directive**	-	-	-	-	74	-
In annexes I and II **of CITES**	2	5	-	-	61	5
In annexes II and III of **Bern Convention**	26	36	11	8	120	26
In annexes II and III of **Bonn Convention**	-	3	-	-	54	-
In annex of **AEWA***	-	-	-	-	122	-

* AEWA – African-Eurasian Migratory Water Bird Agreement
Source: SNC SR

Rescue programmes in 2007 were realized for the following taxons: *Marmota marmota*, *Aquila chrysaetos*, *Aquila pomarina*, *Falco cherrug*, *Falco peregrinus*, *Paranssius apollo* and *Umbra krameri*.

In **breeding** and **rehabilitation stations** operated by the nature and landscape protection organizations (including ZOO Bratislava and ZOO Bojnice) there were **adopted** in 2007 altogether **426** injured individuals or otherwise disabled animals. Back to wild nature there were **released** altogether **191** individuals and there was spent more than 260 thous. SKK.

There was provided **the guarding** of 146 nests of 10 bird of prey species (*Aquila chrysaetos, A. pomarina, A. heliaca, Haliaeetus albicilla, Falco peregrinus, F. vespertinus, Circus aeruginosus, C. pygargus, Pernis apivorus, Milvus milvus*) - information only for the organization organs of SNC SR. There were successfully **brought up 138 nestlings**, which is in average 1 brought up nestlings per nest and there were spent about 215 thous. SKK.

In term of in situ animal preservation in 2007 there were organized **transfers and restitutions** of protected and endangered animals into proper nature biotopes by nature and landscape protection organizations. There were these animals – *Spermophillus citellus, Amphibia, Umbra krameri, Parnassius apollo, Pholidoptera Friwaldskyi* and there was spent altogether 79.1 thous. SKK.

Within the **improvement of nesting and living conditions** of animals, there were realized more than 447 actions, while there was invested more than 550 thous. SKK.

In concern of preventing the collisions of **migrating Amphibians** with the car transport, in 2007, transfers of amphibians were carried out and foil barriers were installed in total length of 18,5 km within the protected areas, as well as in open nature. More than 50 thous. of amphibians were transferred, with app. 50 thous. SKK invested.

- **Game stock and hunting and fishing**

To 31st March 2007, the **spring stock numbers** of the ungulate game species, without Fallow deer species, were higher in comparison to the previous year. Hunting for the rare animal species is strictly regulated.

Spring stock of game and game hunting as of March 31 (pieces)

Species	2004		2005		2006		2007	
	stock	hunting	stock	hunting	stock	hunting	stock	hunting*
Deer	38 264	13 118	39 738	14 030	41 105	12 888	41 287	15 185[1)]
Fallow deer	7 475	2 011	8 425	2 529	8 010	2 208	8 125	2 890[1)]
Roe deer	84 547	20 269	85 124	20 659	87 324	17 313	89 439	22 723[1)]
Wild boar	27 415	23 727	27 116	22 551	27 175	17 820	27 124	25 758[1)]
Brown hare	201 316	31 842	199 226	36 511	208 946	17 560	202 724	39 892[1)]
Grey partridge	18 622	832	17 293	484	15 579	10	13 285	535[1)]
Pheasant	180 105	116 050	181 374	143 373	187 139	110 113	182 287	160 126[1)]
Chamois	522	7	625	12	665	8	645	10[1)]
Bear	1 419	34	1 483	35	1 577	16	1 739	25
Wolf	1 158	86	1 165	74	1 219	91	1 322	123
Otter	315	0	343	0	380	0	480	0

* Actual hunting in numbers, excluding other kills. Source: SO SR

Amount of the fish **caught** in the fish ponds, water dams and water flows for economic and sport purposes achieved **2 871 t** in 2007. The waters were **stocked** by **65 995 735 pieces of setting**.

Fishing for the economic and sport purposes in 2007 (t)

Fish species	2003		2004		2005		2006		2007	
	total	of this SFA*	total	of this SFA*	total	of this SFA*	total	of this SFA*	total	of this SFA*
Fish total Of these:	**2 528**	1 631	**2 783**	1 565	**2 652**	1 663	**2 979**	1 697	**2 871**	1 659
Carp	1 186	1 040	1 360	988	1 281	1 092	1 597	1 169	1 430	1 146
Trouts	743	50	878	52	800	49	837	49	939	54
Crucians	101	71	80	75	76	71	117	71	8	66
White amur	36	34	28	28	33	24	39	33	45	40
Bighead carps	10	4	8	5	12	6	12	4	8	4
Sheat fish	36	35	36	35	37	35	34	33	40	39
Maskalonge	59	56	66	60	74	67	62	60	58	55
Sand-eel	78	78	78	76	83	82	65	64	68	60
Grayling	12	12	9	8	13	7	8	7	12	6
Huchen	1	1	1	1	1	1	1	1	0,2	0,2
Breams	99	98	98	98	106	105	95	94	76	75
Torgoch	1	0	0	0	9	1	2	1	3	1
Chevins	27	27	21	21	16	16	16	16	17	17
Other fish species	139	125	120	117	111	107	94	95	168	96

*SFA – Slovak Fishing Association

Source: SO SR

*The aim of the **air quality** care is to sustain the air quality in places, where it is adequate, and to improve the air quality in other cases.*

§ 5 par. 1 of Act No. 478/2002 Coll. on Air Production, amending Act No. 401/1998 Coll. on Air Pollution Surcharges as subsequently amended (Air Act)

MAJOR CUMMULATIVE ENVIRONMENTAL PRESSURES

• CLIMATE CHANGES

In Slovakia, over the last 100 years, there has been recorded an increasing **trend in the average annual air temperature** by 1.1 °C, and reduction in annual precipitation balance by 5.6 % (south of the SR showed a reduction by more than 10 %, while the north and some sporadic northeast locations showed an increase up to 3 % over the whole century). Significant reduction in **relative air humidity** (up to 5 %) and **reduction in snowcap** almost in the whole of Slovakia were recorded. Characteristics of the potential and actual evaporation, soil humidity, global radiation and radiation balance also prove that the south of Slovakia is gradually drying up (potential evapo-transpiration rises and soil humidity decreases); however, no substantial changes were detected in solar radiation characteristics (with the exception of temporary reduction in the years 1965-1985).

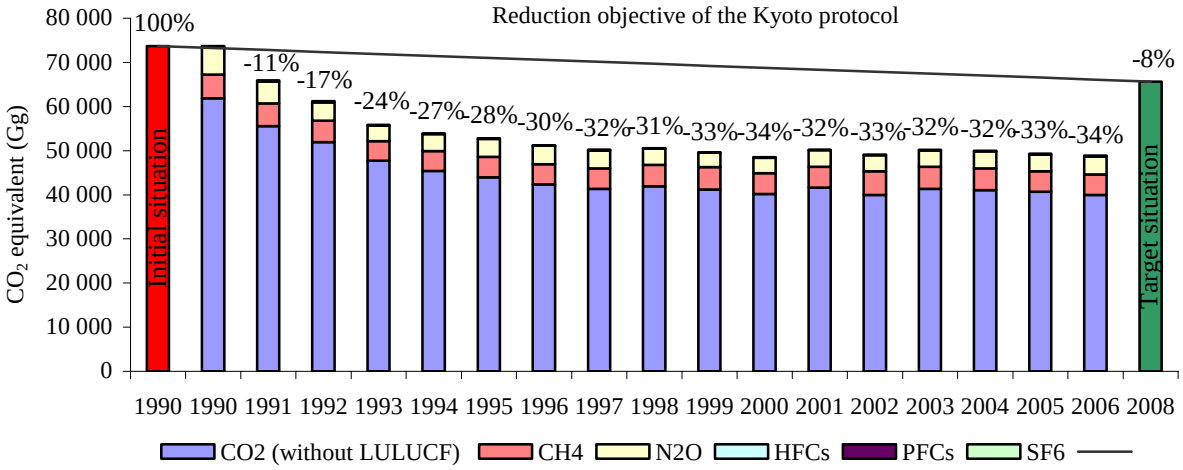
Special attention is given to characteristics of climate variability, especially **precipitation balances.** Over the last 7 years, there was a significant increase in the occurrence of extreme daily precipitation figures, which consequently produced a significant increase in local floods in various regions of Slovakia. On the other hand, mainly in the years 1989-2002, there was a more frequent occurrence of local or overall drought, which was caused mainly by long periods of relatively warm weather patterns. Especially harmful were droughts in the periods of 1990-1994, 2000, and 2002.

International obligations in the area of climate changes

At the UN Conference on Environment and Development (Rio de Janeiro, 1992) was adopted **framework Convention on Climate Change** – basic international legal instrument for protection of global climate. The convention became effective in the Slovak Republic on November 23, 1994. Slovakia accepted all obligations stemming from the Convention, including the obligation to decrease greenhouse gases emissions by the year 2000 to the level of 1990. Aggregated emissions of greenhouse gases in 2000 (47.448 Gg CO_2 equivalent) did not exceed the level of 1990 (73.679 Gg CO_2 equivalent).

Next internal goal that Slovakia set to achieve was to reach the „Toronto Objective" i.e. 20 % reduction in emissions by 2005, compared to 1988. At the conference of signatories to the UN Framework Convention on Climate Change in Kyoto, Japan, in December 1997, Slovakia bound itself to reduce the production of greenhouse gases by 8 % by 2008, compared to 1990, and to continue keep the same level until 2012. The Protocol became effective after its ratification by the Russian Federation, on February 16, 2005, which is the 90th day after its signing by at least 55 countries, including the countries listed in Annex 1, that contribute by at least 55 % to total CO_2 emissions for the year 1990 as listed in Annex B accompanying the article 25 of the Kyoto Protocol.

Assessment of anthropogenic emission of greenhouse gases under compliance with the Kyoto protocols outcomes



Source: SHMI

Balance of greenhouse gases emissions

On the basis of **greenhouse gases emissions** assessed under the IPCC methodology (Intergovernmental Panel of Climate Change) in 2006, total anthropogenic CO_2 emissions, without deducting detections in the LULUCF sector (Land use, land use change and forestry), reached the value of 39 984.02 Gg. Sink of carbon dioxide in forest ecosystems in 2006 was -3 028.72 Gg (appr. -2 388.50 Gg in 1990). Total CH_4 emissions in 2006 reached the value of 220.36 Gg (256.93 Gg in 1990), while total NO_2 emissions in the same year reached 13.03 Gg (19.91 Gg in 1990). Anthropogenic emissions of greenhouse gases reached their highest level in the late 80-ties, while in 2006 their levels dropped by 34 %, compared to the reference year of 1990.

Aggregated greenhouse gases emissions constitute total emissions of greenhouse gases expressed as the CO_2 equivalent, calculated through the GWP 100 (Global warming potential). In 2006, CO_2 emissions represent more than 83 %, CH_4 emissions are on the level over 9 %, while N_2O emissions contribute 8 %, and the share of the F-gases (HFC, PFC, and SF_6) is less than 1 %.

Share of individual industries on the production of greenhouse gases remains very similar to the year 1990. The area of agriculture shows the most significant difference, with the reduction in emissions

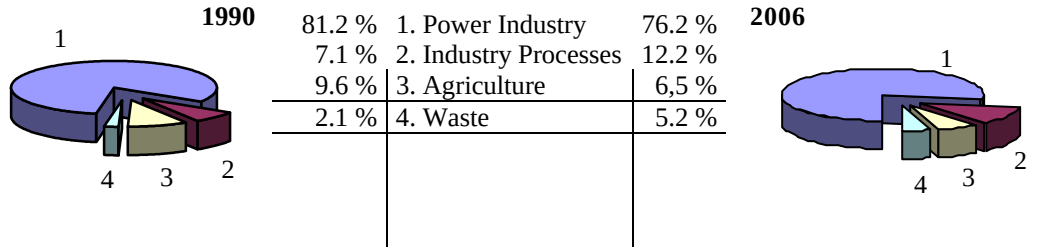
by 3.1 %, compared to 1990. This change was caused mainly by a reduced use of industrial fertilizers and reduced numbers of livestock. Industrial processes and waste noticed in 2006 accumulation share of greenhouses gases emissions.

Aggregated emissions of greenhouse gases (Tg) in CO_2 equivalents

Tg (CO_2 equivalent)	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Net CO_2	43.41	42.12	41.22	39.92	39.92	39.98	39.59	37.79	36.42	34.73	36.53	36.81	39.83	36.93
CO_2*	47.69	44.44	43.92	42.37	41.33	41.92	41.23	40.20	41.64	39.97	41.36	41.07	40.70	39.98
CH_4	4.47	4.45	4.64	4.58	4.63	4.86	5.07	4.68	4.73	5.33	4.96	4.93	4.63	4.63
N_2O	3.51	3.85	4.08	4.21	4.10	3.70	3.25	3.52	3.72	3.68	3.72	3.82	3.79	4.04
HFCs, PFCs, SF_6	0.16	0.14	0.15	0.08	0.11	0.08	0.09	0.10	0.11	0.13	0.17	0.19	0.21	0.25
Total (with CO_2)	51.54	50.57	50.10	48.83	48.76	48.64	48.03	46.11	44.99	43.89	45.39	45.77	48.48	45.87
Total*	**55.83**	**53.88**	**52.79**	**51.24**	**50.16**	**50.57**	**49.65**	**48.50**	**50.20**	**49.11**	**50.20**	**50.00**	**49.33**	**48.90**

Emission were assessed by 15.04.2008 Source: SHMI
The table shows calculated years 1990-2005
** Emissions without deducting the sinks in the sector of LULUCF (Land use-Land use change and forestry)*

Share of individual sources on greenhouse gases emissions



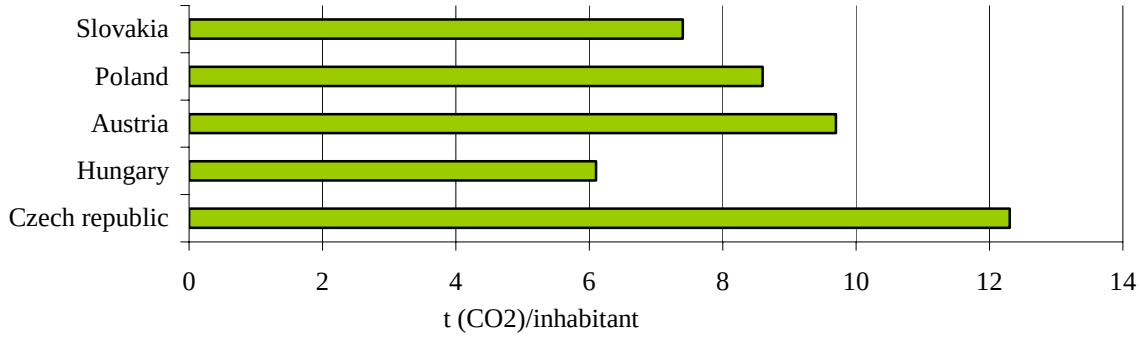
Emission were assessed by 15.04.2008 Source: SHMI

Aggregated emissions of greenhouse gases (Tg) by sectors in CO_2 equivalents

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Power Industry*	46.54	44.02	42.35	40.78	39.65	39.62	38.85	38.33	39.67	37.89	39.54	38.37	37.96	37.19
Industry Processes**	3.43	4.12	4.43	4.57	4.62	5.06	4.87	4.63	4.89	4.82	4.68	5.67	5.62	5.94
Using solvents	0,02	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.03	0.06	0.06	0.08	0.09	0.08
Agriculture	4,39	4.12	4.39	4.22	4.02	3.71	3.47	3.48	3.53	3.55	3.41	3.23	3.22	3.16
LULUCF	-4.27	-3.31	-2.68	-2.41	-1.39	-1.93	-1.62	-2.39	-5.21	-5.23	-4.81	-4.23	-0.85	-3.03
Waste	1.45	1.52	1.59	1.64	1.85	2.16	2.44	2.03	2.09	2.80	2.52	2.65	2.45	2.53

Emission were assessed by 15.04.2008 Source: SHMI
The table shows calculated years 1990-2005
** Including the traffic*
*** Including the F-gases*

Comparison in CO emissions in selected countries – in 2005



Source: Eurostat

*The limit value of air pollution is **the level of air pollution** defined in order to avert, prevent or diminish harmful impact on human health, which should be reached in particular time, and from that time on it shall not be exceeded.*

§2 letter e/ of the Act No 478/2002 Coll. on Air Protection

• ACIDIFICATION

Air Acidification

Slovakia is a signatory to the **UN Economic Commission Convention on Long-Range Trans-boundary Air Pollution** (which became effective for ČSFR in March 1984 and Slovakia being its successor since May 1993). This Convention became the basis for protocols which also spelled out obligations for the signatories to reduce individual anthropogenic emissions of pollutants contributing to global environmental problems. The following text shows how individual protocol's obligations in the area of acidification are met:

➢ ***Protocol on further reduction of sulfur emissions***

This protocol was signed in Oslo in 1994. Ratified by the Slovak Republic in January 1998 the protocol became effective in August 1998. Obligations of the Slovak Republic to reduce the SO_2 emissions as set forth in the Protocol (compared to the reference year of 1980) include:

Obligation to reduce SO_2 emission pursuant to Protocol on further reduction of sulfur emissions

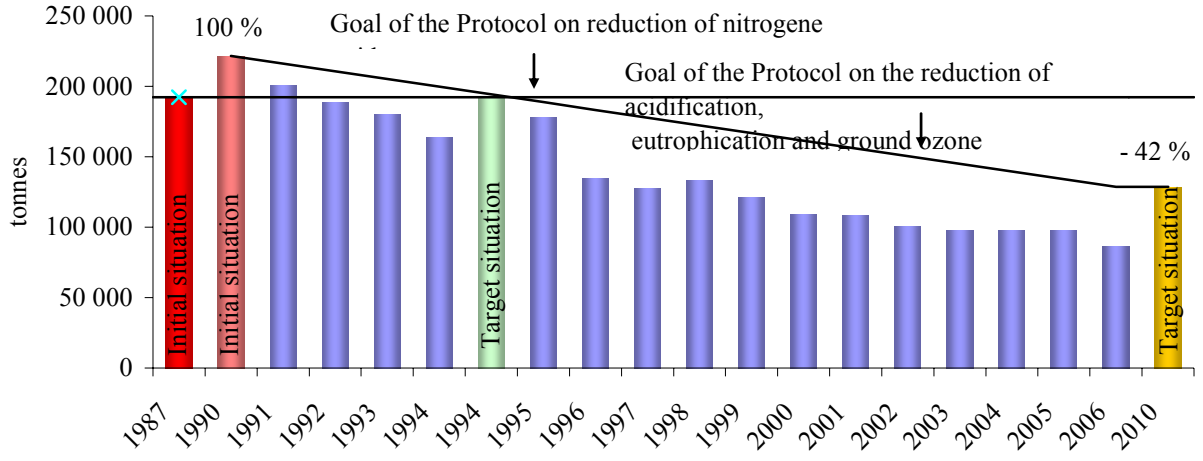
Year	1980 (initial year)	2000	2005	2010
SO_2 emission (thous. t)	843	337	295	240
SO_2 emission reduction (%)	100	60	65	72

Slovakia met one of its Protocol objectives to reduce the SO_2 emissions in 2000 by 60 % compared to the reference year of 1980. In 2000 sulfur dioxide emissions reached the level of 126.952 thousand tons, which is 85 % less than in the years 1980. In 2005 it was 89 thousand tons, which is 89 % less then in the year 1980.

➢ ***Protocol on the Reduction of Acidification, Eutrofication and Ground Ozone***

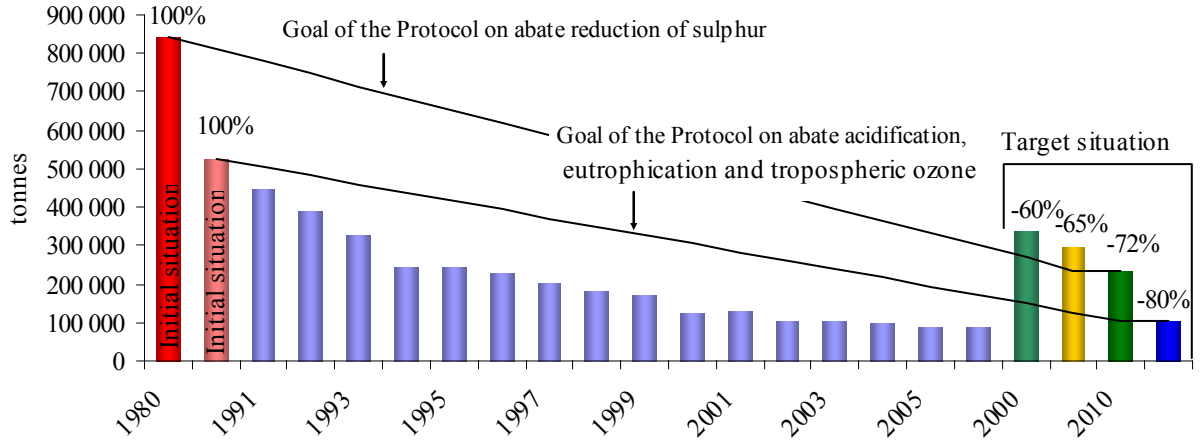
The protocol was signed in Göteborg in 1999. Slovakia signed the protocol in 1999 and ratified in 2005. Slovakia obliged itself to reduce the SO_2 emissions by 2010 by 80 %, the NO_2 emissions by 2010 by 42 %, the NH_3 emissions by 2010 by 37 % and the VOC emissions by 2010 by 6 % in comparison to the year 1990. Slovakia has the potential to fulfill this obligation.

Trend in NO_x emission with regard to following the outcomes of international agreements



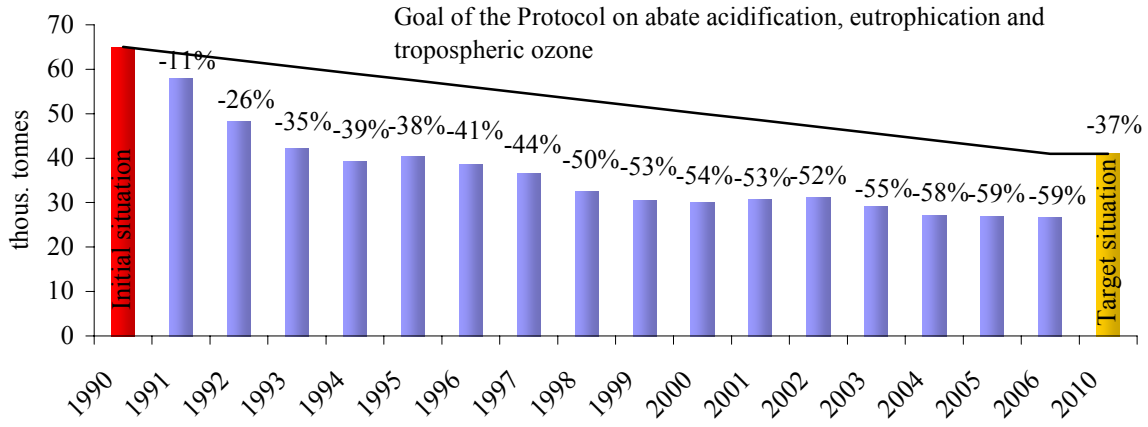
Source: SHMI

Trend in SO_2 emission with regards to following the outcomes of international agreements



Source: SHMI

Trend in NH_3 emission with regard to following the outcomes of international agreements



Source: SHMI

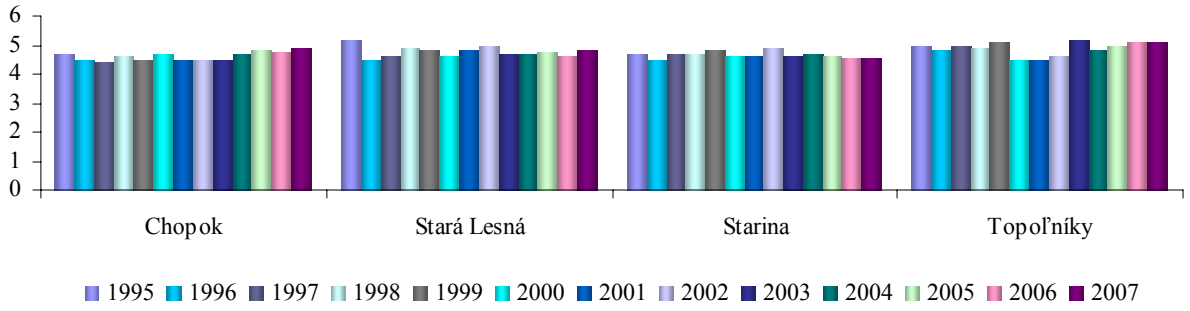
During the period of the years 1990-2006 in case of SO_2 and HN_3 the recorded reduction in emissions was obvious (with slight deviations in some years). Nitrogen oxides emissions showed a slight decrease only in 1995 and 1998 their increase was caused by increased natural gas consumption by retail consumers.

Acidity of atmospheric precipitations

Natural acidity of precipitation water in equilibrium with carbon dioxide has the pH of 5.65. Atmospheric precipitations are considered acidic if the bulk charge of the acidic anions is greater than the charge of cations and the pH value is below 5.65. Sulfates by approximately 60-70 % and nitrates by approximately 25-30 % contribute to the acidity of precipitation water.

In 2007, total **atmopheric precipitations** at regional stations were between 551 and 1 087 mm. Upper limit of the interval was occupied by the highest located station of Chopok, while the bottom limit was occupied by Topoľníky, with the lowest altitude. Acidity of atmospheric precipitations was dominant at Starina, copying the lower limit of the pH interval of 4.54 - 5.07. Time sequence and pH trend over a longer time period show a reduced acidity. pH values well correspond with the pH values by the EMEP maps.

Trend of pH precipitation



Source: SHMI

Concentrations of dominant sulfates in precipitation water showed the interval of 0.49 - 0.54 $mg.l^{-1}$. Interestingly, sulphate concentrations at three highest located stations are equal in annual average, they are only slightly lower at Topoľníky. The overall reduction in sulfate concentrations over a long period corresponds to the reduction of SO_2 emissions since 1980. Values for wet deposition of sulphates were ranging between 0.27 to 0.59 $g.S.m^{-2}.r^{-1}$. So far, no critical loads have been set in Slovakia for wet deposition. In USA and Canada, wet deposition value of 0.7 g $S.m^{-2}$ per year for sulphates is considered the critical load for forests.

Nitrates that show less influence on the acidity of precipitations than sulfates showed the concentration interval of 0.28 - 0.38 mg $N.l^{-1}$. Ammonia ions also belong to the major ions, with their concentration interval representing 0.32 - 0.58 $mg.l^{-1}$.

Wet deposition of sulphates ($g.S.m^{-2}.r^{-1}$) - 2007

Station	Wet deposition of sulphates $g.S.m^{-2}.r^{-1}$
Chopok	0.59
Stará Lesná	0.43
Starina	0.40
Topoľníky	0.27

Source: SHMI

Lead concentrations in atmospheric precipitations were between 0.92 µg/l (Topoľníky) and 1.99 µg/l (Starina). All stations showed lower Pb values, compared to 2006. The greatest difference was recorded at Chopok.

Cadmium concentrations were ranging between 0.04 µg/l (Topoľníky) and 0.09 µg/l (Stará Lesná). Compared to 2006, Cadmium values were lower at all stations.

With the exception of Chopok and Statá Lesná, **Zinc** values at the other stations were higher, when compared to 2006.

Arsenic showed greatest reduction at Chopok, compared to the other stations. With the exception of Starina, **nickel** and **chromium** values at the other stations were lower, compared to 2006.

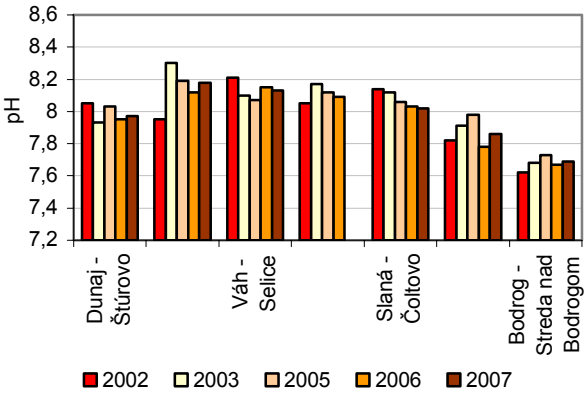
Copper content decreaseed most at Chopok, less in the other station, and at Starina there was higher concentration than in the previous year.

Lead and **cadmium** in precipitations represent metals of the highest quality. It has not been possible to assess them in a more complex way due to the short time span, just like the other mentioned metals monitored since 2002.

Acidification of surface water

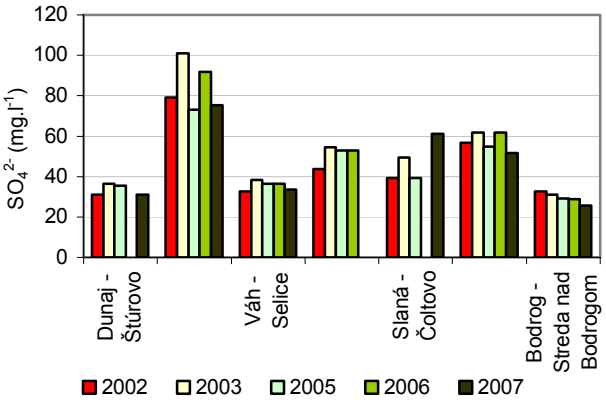
In general, considering the diversity of the rock aquifer, soil types, hydrological and climate conditions, general assessment of acidification renders itself difficult. Surface water acidification fluctuates depending on the season, especially in running water. Surface stream and lake water is most acidic in spring. In total we can say that the trend in the pH values sulfate concentrations and alkalinity of surface water show variable and fluctuating characteristics. Currently thanks to valid legal standards for releasing acidification mixtures the content of atmospheric and precipitation sulfates and nitrates dropped, meanwhile reducing the risk of acidification of surface and groundwater.

Trend in pH in selected Slovak watercourses (annual average values)



Source: SHMI

Trend in sulphates in selected Slovak watercourses (annual average values)



Source: SHMI

Acidification of soils

Acidification as a process of raising the soil's acidity represents one of the important processes of chemical degradation. Ability of the agro-ecosystem to cope with natural and anthropogenic acidification is defined by the capacity and potential of the buffering function of the soil. This reflects a degree of soil resistance to acidification.

Partial Monitoring System - Soil, provides information on the state and development of acidification of agricultural soil. Monitoring of acidification of forestland is part of the whole-European forest monitoring programme.

Outcomes from the Partial Monitoring System - Soil (PMS-S) showed that during 1993 through 1997 there were statistically negligible changes and stabilisation processes in soil acidification. On the contrary, outcomes from the third monitoring cycle with the extraction year of 2002 showed significantly greater acidification tendencies, especially in case of mollic fluvisols, cambisols, podsols, rankers, and lithomorphic soils.

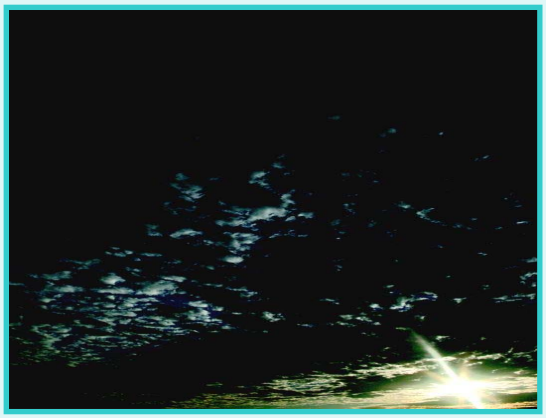
Content of active aluminium was in negative correlation with soil reaction values. The chart shows its content growing significantly with reduction in soil reaction.

Shown pH values dependent on active aluminium in selected SR soils for the A horizon within the basic partial monitoring system (PMS-P) in third monitoring cycle (active Al determined in soils with pH in KCl of < 6.0)

Soil representative	pH in KCl	Al in mg.kg^{-1}	Al^{3+}/Ca^{2+}
		x	
Cambisols on vulcanite - PG	4.86	45.79	5.40
Cambisols on acidic substrates and AL shale	5.50	4.38	0.50
Cambisols on acidic substrates and PG shale	4.40	80.64	1.87
Cambisols and planosols on AL flysch	5.53	42.24	0.63
Cambisols and planosols on PG flysch	4.67	107.51	1.41
Mollic fluvisols on non-carb. fluvial AL sediments	4.85	4.22	0.12
Fluvisols on non-carb. fluvial AL sediments	5.66	85.83	2.46
Pseudogley on polyg. AL loess soils	5.78	8.16	1.22
Pseudogley on polyg. PG loess soils	5.52	11.78	0.15
Luvisols on AL loess	6.12	5.14	0.44
Podsols, rankers, and litosols var. silicate PG	3.16	661.35	58.81

AL – arable land, PG – permanent grassland, x – arithmetic average

Source: SSCRI



*The mass media regularly and free of charge inform the public about the **situation of the ozone layer of the Earth** and about the values of the ultra-violet radiation falling on the area of Slovak Republic.*

§ 13 par.1 of the Act No. 76/1998 Coll. on Protection of the Ozone Layer of the Earth ... as amended by the Act No. 408/2000 Coll. and the Act No. 553/2001 Coll.

• OZONE LAYER DEPLETION

International liabilities concerning ozone layer protection

Due to the urgency of this global problem, the international community adopted at its UN platform a number of steps to eliminate the ozone layer depletion. First international forum with the first-ever mentioning of the ozone layer took place in Vienna in 1985, with the **Vienna Convention on the Ozone Layer Protection** signed there. In 1987, this document was closely followed by adopting the first enforcing protocol to the **Montreal Protocol on Ozone-depleting Substances**. Since that year, signatories to the Montreal Protocol met five times (in London (1990), in Copenhagen (1992), in Vienna (1995), in Montreal (1997) and in Beijing (1999)), to limit or, if necessary, totally eliminate the production and consumption of substances that deplete the ozone layer.

Slovakia made effective the **Montreal Annex** to the Montreal Protocol on February 1, 2000. This document prohibits Slovakia to import and export all controlled substances, including methyl bromide, from and to non-signatory countries, as well as sets forth the obligation to introduce a licensing system for import and export of controlled substances. In 2002, Act 408/2000 Coll. was adopted, which amends Act 76/1998 Coll. on the Earth's ozone layer protection and on amendment to Act 455/1991 Coll. on small business (Small Business Act) as amended, which transposed the decisive majority of responsibilities stipulated under the European Parliament and Commission Directive 2 037/2000 EC and banned the production of brom-chloro-methane, creating conditions for ratification of the **Beijing Annex** of the Montreal Protocol. (for Slovakia effective as from August 20, 2002).

Consumption of controlled substances

Slovakia does not produce any ozone-depleting substances. All such consumed substances come from the export. These imported substances are used mainly in cooling agents and detection gases, solvents, and cleaning chemicals.

Consumption of substances under control in SR during 1995-2007 (tons)

Group of substances	1986/89	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
AI - freons	1 710.5	379.2	1.21[1)]	2.05[1)]	1.71[1)]	1.69[1)]	2.07	4.1	0.996	0.81	0.533	0.758	0.29	0.43
A II - halons	8.1	0	0	0	0	0	0	0	-	-	-	-	-	-
BI* - freons	0.1	0	0	0	0	0	0	0	-	-	-	-	-	-
B II* - CCl4	91	0.6	0	0.16[1)]	0.07	0.08	0.022	0.03	0.01	0.009	0.047	0.258	0.045	0
BIII* - 1,1,1 trichloroethane	200.1	69.4	0	0.11[1)]	0	0	0	0	-	-	-	-	-	-
C I*	49.7	37.2	61.00	59.90	90.48	44.92	64.73	66.8	71.5	52.91	38.64	48.76	43.94	41.32
C II - HBFC22B1	-	-	14.30	0	0	0	0	0	-	-	-	-	-	-
E** - CH_3Br	10.0	-	9.60	5.60	10.20	0	0	0.48	0.48	0.48	0.48	0	-	0
Total	2 019.5	449.2	86.10	61.81	102.50	46.69	66.82	71.4	72.986	54.21	39.7	49.78	44.28	41.75

[#] Initial usage ∗ Initial year 1989 ∗∗ Initial year 1991 Source: MoE SR

[1)] Usage of substances in groups A I, B II a B III between 1996-2001 represents import of these substances for their analytical and laboratory use in accordance with the general exception from the Montreal Protocol

Note 1: Besides the indicated substances, another 250 tons of recycled tetrachloromethane and 20 tons of regenerated freon CFC 12 *were imported in 1996, which (with reference to applicable methodology) are not counted in the consumption figures. The data from previous years on usage of substances in groups C I, C II and E are not available.*

Note 2: *Besides the indicated substances, another 40 tons of used Freon CFC 12 were imported in 1997, which (with reference to applicable methodology) are not counted in the consumption figures, and 2.16 tons of methyl bromide for Slovakofarma, which was used as base material for pharmaceutical production and with reference to applicable methodology also are not counted in the consumption figures.*

Note 3: *Besides the indicated substances, 8.975 tons of used coolant R 12 were imported in 1998, which belongs to group A1. With reference to applicable methodology of the Montreal Protocol it is not are not counted in the consumption figures.*

Note 4: *Besides the indicated substances, another 1.8 tons of used Freon CFC 12 were imported in 1999, which (with reference to applicable methodology) are not counted in the consumption figures, and 1.04 tons of methyl bromide for Slovakofarma, which were used as base material for pharmaceutical production and with reference to applicable methodology also are not counted in the consumption figures.*

Note 5*: In 2001, 0.48 tons of methyl bromide were imported for Slovakofarma, which were used as base material for pharmaceutical production and with reference to applicable methodology are not counted in the consumption figures.*

Note 6*: In 2002, 0.48 tonnes CH_3Br were imported for Slovakofarma, which were used as base material for pharmaceutical product (Septonex) and with reference to applicable methodology are not counted in the consumption figures.*

Usage of substances under control in 2006 (tons)

Usage	Group of substances							
	AI	A II	BI	B II	BIII	C I	C II	E
Coolant	-	-	-	-	-	41.32	-	-
Fire extinguishers	-	-	-	-	-	-	-	-
Isolating gases	-	-	-	-	-	-	-	-
Detection gases, diluents, detergents	0.43	-	-	0.00	-	-	-	-
Aerosols	-	-	-	-	-	-	-	-
Swelling agents	-	-	-	-	-	-	-	-
Sterilizers, sterile mixtures	-	-	-	-	-	-	-	-

Source: MoE SR

Total atmospheric ozone and ultraviolet radiation

The average annual value of total atmospheric ozone in 2007 was 357.7 Dobson units (D.U.), which is 3.7 % below the long-term average from measurements in Hradec Králové in 1962-1990. Values from these measurements have been used also for our territory as the long-term normal value.

Average monthly deviations within 2007

Month	1	2	3	4	5	6	7	8	9	10	11	12	Year
Average (DU)	329	353	377	358	350	335	316	307	308	291	296	311	325.7
Deviation (%)	-4	-5	-1	-7	-6	-6	-7	-5	2	1	2	0	-3.7

Source: SHMI

With respect to the recent scientific knowledge, the long-range goal concerning the ozone is to achieve ***the level of ozone concentration in air,*** *at which the direct harmful effects on human health or on the environment will be unlikely; this goal should be achieved, if possible, with the long range prospective, so that effective protection of human health and environment is provided for.*

§ 5 par.4 of the Act No. 478/2002 Coll. on Air Protection

• TROPOSPHERIC OZONE

Average concentrations of tropospheric ozone in the Slovak territory were growing during the years 1973-1990 by app. 1 $\mu g.m^{-3}$ per year. After 1990, in line with all Central European monitoring outcomes, no significant trend in average concentrations was recorded. Maximal concentrations were decreasing over the last decade. However, ground ozone values are more than two-times higher than they were in the beginning of this century. The exceptional year of 2003 showed extraordinary hot patterns with increased concentrations recorded at all stations. Ground ozone concentrations in the Slovak territory in 2006 were only slightly below the record-breaking values in 2003. Average annual concentrations of ground ozone in Slovakia in contaminated urban and industrial locations in 2007 were within the interval of 44-91 $\mu g.m^{-3}$. Greatest average annual ground ozone concentrations in 2007 were recorded at the Chopok station (91 $\mu g.m^{-3}$).

Target value of ground ozone concentration in terms of public health protection is set by the MoE SR Resolution No. 705/2002 Coll. on air quality quoting Resolution 351/2007 Coll. at 120 $\mu g.m^{-3}$ (max. daily 8-hour average). This value must not be exceeded on more than 25 days in of the year, for three consecutive years. For the period of 2005-2007, this target value has been exceeded at all stations, with the exception of Prievidza. Concentrations exceeding the public alarm threshold (240 $\mu g.m^{-3}$) were in 2007 were recorded at Bratislava (Mamateyova) station. Six stations recorded figures that exceeded the information threshold (180 $\mu g.m^{-3}$) - most (17 times) at Bratislava (Mamateyova).

Number of days with exceeded target value for protection of public health – 2005, 2006, 2007, average for 2005-2007

Station	2005	2006	2007	Averaged in 2005-2007
Bratislava, Jeséniova	52	[a] 50	31	44
Bratislava, Mamateyova	42	34	37	38
Gánovce, Meteo. st.	[a] 29	39	25	31
Humenné, Nám. slobody	41	[a] 35	31	36
Chopok, EMEP	77	[b] 53	66	65
Jelšava, Jesenského	13	31	50	31
Kojšovská hoľa	59	63	74	66
Košice, Ďumbierska	33	[b] 0*	20	26
Prievidza, J. Hollého	[a] 12	18	21	17
Stará Lesná, AÚ SAV, EMEP	30	[a] 44	36	37
Starina, water basin, EMEP	39	[b] 27	18	28
Topoľníky, Aszód, EMEP	47	41	46	45
Žilina, Obežná	19	30*	40	30

[a] *75-90%,* [b] *50-75%,* [c] *less than 50% of valid measurements* Source: SHMI

Target value for the **AOT 40 vegetation protection exposition index** is 18 000 µg.m^{-3}.h (MoE SR Resolution No. 705/2002 Coll. on air quality quoting Resolution 351/2007 Coll.). Average values for the years 2003-2007 were exceeded at all reference urban and rural stations, with the exception of Prešov, Prievidza, Ružomberok, Stará Lesná, and Veľká Ida.

Values for the AOT 40 for vegetation protection - the year 2007 and for the averaged period of 2003-2007 (target AOT value for the year 2010 is 18 000 µg.m^{-3}.h for 5 years on average)

Station	Averaged in 2003-2007	2007
Bratislava, Jeséniova	25 322	20 654
Bratislava, Mamateyova	20 775	22 900
Humenné, Nám. slobody	22 150	21 608
Jelšava, Jesenského	21 440	25 987
Košice, Ďumbierska	*19 963	18 397
Prievidza, J. Hollého	15 580	17 466
Žilina, Obežná	19 252	21 891
Gánovce, Meteo.st.	22 360	19 028
Chopok, EMEP	30 777	26 477
Kojšovská hoľa	26 506	29 146
Stará Lesná, AÚ SAV, EMEP	18 880	20 505
Starina, water basin, EMEP	19 531	19 320
Topoľníky, Aszód, EMEP	25 863	26 102

** data from the year 2006 or 2007 were not incuded in calculating the average, since the station did not measure in the summer - did not measure during the monitored period*

Source: SHMI

The reference AOT 40 value for the protection of forests for annual reporting to EC is 20 000 µg.m^{-3}.h, and is valid for urban, rural and rural reference stations. These stations show values that are exceeded every year, at some stations during the photochemical active years, the values are exceeded more than two times as much.

Eutrophication *is enrichment of water by nutrients, especially compounds of nitrogen and phosphorus, causing an increase in growing cyanobacteria, algae and higher herbal species, which can result in undesirable deterioration of ecological stability and quality of this water.*

§ 2 letters ac/ of the Act on Water No. 364/2004 Coll., amending the Act No. 372/1990 Coll. on Offences as subsequently amended (Water Act)

• EUTROPHICATION

Eutrophication means enriching the water with nutrients, mainly nitrogen and phosphorus compounds, which causes an increased growth of algae and higher plant forms. This may bring about an undesirable deterioration in the biological equilibrium and quality of such water. Indicators for the surface water eutrophication include $N\text{-}NH_4$, $N\text{-}NO_3$, $N\text{-}NO_2$, $N_{org.}$, $N_{tot.}$, $P_{tot.}$, with phosphorus as the limiting element being most critical in Slovakian watercourses.

General requirements for the surface water quality are set forth in the Government Ordinance SR No. 296/2005 Coll. which introduces requirements on the quality and qualitative goals of surface water, as well as the limit indicator values for wastewater and special water contamination. Annex 1 of this Ordinance defines the recommended values for total nitrogen (9.0 $mg.l^{-1}$), total phosphorus (0.4 $mg.l^{-1}$), and chlorophyl „a“ (50.0 $\mu g.l^{-1}$). In 2007 total nitrogen and phosphorus concentrations in surface water in selected water courses did not exceed the limit values defined by the Government Ordinance.

In this sense, the most problematic watercourses include Morava, Nitra, and Ipeľ. Nutrient concentrations are generally higher toward the mouth of the river. Assessing the whole **C - nutrients** group and comparing it with previous time period, there have not been major changes and surface water quality that meets group II. and III. criteria.

Nature and Landscape Protection *is the limitation interferences, which can threaten, harm or destroy living conditions and forms, natural heritage, scene, lower its ecological stability, as well as consequences elimination of such interferences. Nature protection is also taking care of ecosystems.*

§ 2 par. 1 of the Act No. 543/2002 Coll. on Nature and Landscape Protection

NATURE AND LANDSCAPE PROTECTION

• NATURAL HERITAGE AND ITS PROTECTION

Protected areas

♦ **Protected areas network**

Pursuant to the **Act No. 543/2002 Coll. on nature and landscape protection**, the system of complex nature and landscape protection is carried out under 5 protection levels and in the following protected areas (PA) categories:

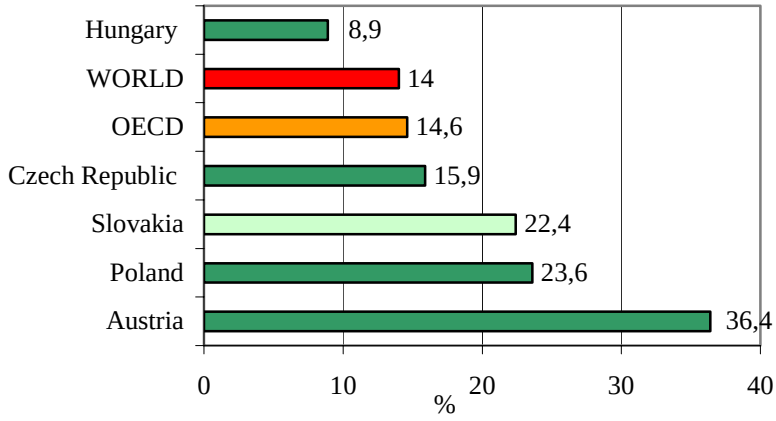
1st level of protection - territory of the SR not included in any of the higher levels of protection
2nd level of protection - protected landscape area (PLA),
- protected landscape fragment (PLF),
- zone D of protected area,
- protective zone of the PA with 3rd level of protection.
3rd level of protection - national park (NP),
- protected site (PS),
- protected landscape fragment,
- zone C of the protected area,
- protective zone of the PA with 4th level of protection.
4th level of protection - protected site,
- nature reserve (NR), national nature reserve (NNR),
- nature monument (NM), national nature monument (NNM),
- protected landscape fragment,
- zone B of the protected area,
- protective zone of the PA with 5th level of protection.
5th level of protection - protected site,
- nature reserve, national nature reserve,
- nature monument, national nature monument,
- protected landscape fragment,
- zone A of the protected area,

- *cave and cave protective zone,*
- *natural waterfall and protective zone of the natural waterfall,*
- *special protection area (SPA)*

In 2007, 3 new protected areas were **declared** (1 PS, 1 PLF, and 1 NR – effective as from 2008), 2 new protected trees, and 2 protected cave protection zones (1 NM and 1 NNM), **updated** were 3 protected areas (2 NR and 1 NNR including 1 NR also with zoning), **cancelled** were 4 protected areas (3 PS and 1 NM) and 11 protected trees. In 2007, **protection degree** was decreased from 5 to 4 for 2 protected areas (2 NR) by regional environmental legislation.

Of the protected areas declared in 2006, 1 PS, 1 updated NNR, and 2 cancelled areas (1 NM and 1 PS) became effective in 2007. Also, resolutions from 2006 on declaring 3 and cancelling 2 protected trees came in effect. Also, resolution on tourist code for NP Slovenský kras became effective.

Proportion of PA on total size for selected countries (2004)



Source: OECD

Protected areas in the Slovak Republic (state to 31st December 2007)

Category	Number	Designated size of protected area (ha)	Designated size of protective zone (ha)	% of SR territory
Protected landscape areas	14	522 582	-	10.66
National parks	9	317 890	270 128	6.48+5.51
NP + PLA together	**23 1 110 600 ha**	**840 472**	**270 128**	**22.65**
Protected sites	170	5 247	2 420	0.16
Nature reserves	384	12 855	244	0.27
Private nature reserves	1	3	-	0.00
National nature reserves	219	84 156	2 401	1.77
Nature monuments	230	1 606	259	0.04
National nature monuments	60	59	1 507	0.03
Total SSPA*	**1 054 110 757 ha**	**103 926**	**6 831**	**2.26**

* SSPA – small-size protected areas

Source: SNC SR

In total, **in the territory of PLA** there are **242 small-size** protected areas (SSPA) with total size (together with protective zones) of 12 106 ha (this represents 2.3 % **of total PLA territory**), while **in the territory of NP and their protective zones** (PZ) there are **266** SSPA with total size (including PZ) of 73 584 ha (**12.5 %** of the NP area and their PZs). **Outside PLA, NP, and NP PZ**, which means **the open**

landscape, there are **556** small-size protection areas with the size (together with PZ) of 25 070 ha (**22.6 %** of total SSPA and SSPA PZ) and 0.67 % of the open landscape area.

Further, there are **19** declared **special protection areas** with total size of **357 667 ha** (part of them overlaps with other protected areas) and **10 caves** (NNM or NM) with declared protection zone of total size of **1 534.4927 ha**.

♦ Endangerment and degradation of the protected areas

The condition of protected areas ranked into the 3th - 5th level of protection and protected trees is evaluated in 3 endangerment categories. Of the total number of 1 064 small-size protected areas in the 3th - 5th level of protection, there were **degraded** 34 territories of area of 325 ha (this area presents 0.3 % of total area of SSPA), 437 **endangered** (18.4 % of area) and in the **optimal condition** there were 593 territories (81.3 % of area).

Endangerment and degradation of SSPA

Category	Condition to 31st December 2007		Optimal		Endangered		Degraded	
	number	area (ha)	number	area (ha)	number	area (ha)	number	area (ha)
PLF	1	3	1	3	0	0	0	0
PS	170	7 668	50	3 824	103	3 786	17	58
NR	384	13 099	211	8 762	162	4 096	11	240
NNR	219	86 558	161	74 996	58	11 562	0	0
NM	230	1 866	119	908	105	931	6	26
NNM	60	1 566	51	1 530	9	36	0	0
Total	**1 064**	**110 760**	**593**	**90 024**	**437**	**20 412**	**34**	**325**

Note: In the area of SSPA there are included areas of SSPA protective zones Source: SNC SR

♦ Care of the protected areas

Professional nature protection organisations carried out **regulatory intervention** in the field of practical care of the specially protected nature and landscape parts, with total cost of over 2.7 mil. SKK, with more impacts into this territory (mowing, tree cutting, elimination of younglings, protective treatment of rare tree types, liquidation of invasive plant species and other).

During the year 2007 State Nature Conservancy of the SR (SNC SR) elaborated 7 818 **nature and landscape impact proposals**. The biggest rate was created by the building and regional planning activities (26.3 %), department of tree species protection (19.5 %) and species protection of the plants and animals (11.9 %). Viewpoints relating to forestry created 9.9 %, inorganic nature 4.8 %, territorial protection 4.5 %, agriculture 4.4 %, water management 3.1 % and EIA 2.9 % of all viewpoints.

In 2007 there were **75 education paths (EP) and 43 education localities (EL)** put in operation. Within the organisation units of State Nature Conservancy of the SR, in 2007 maintenance of 45 EP were realized, including the reconstruction of 13 EP and 8 new were opened. **11 information centres of nature protection** and the **Nature Protection School** in Varín were administered.

Review of Biosphere Reserves and Ramsar-wetlands in selected countries

		Slovakia	Czech Rep.	Poland	Hungary	Austria
Biosphere Reserves (BR)	Number	4	6	9	5	6
Ramsar-wetlands	Number	14	12	13	26	19
	area (km^2)	404	547	1 258	2 064	1 223

Source: SNC SR, UNESCO-MaB, www.ramsar.org, 2007

CR) BR: one common with Poland.
Slovakia) BR: one common with Poland and one with Ukraine.
Poland) BR: one common with Czech Republic and with Slovakia and one with Slovakia and Ukraine.

♦ **NATURA 2000 in Slovakia**

- **Sites of Community Importance (SCI)** are proposed for **44 plant**, **96 animal species** and **66 types of biotopes**.

Into the **proposed list** of the SCI there were listed **382 territories** with the area of **573 690 ha**. The territories cover **11.7 % of the SR area**, lapping with present network of protected areas is **86 %**. From the total area of the SCI, there is 86 % on forest land, 10 % is on agricultural land, 2 % is created by water areas and 2 % are other areas.

National list of SCI was published *on the basis of the MoE SR Edict* of July 14, 2004, which publishes the national list of the sites of Community importance. These territories are presently under the so-called preliminary protection, which means the proposed protection level.

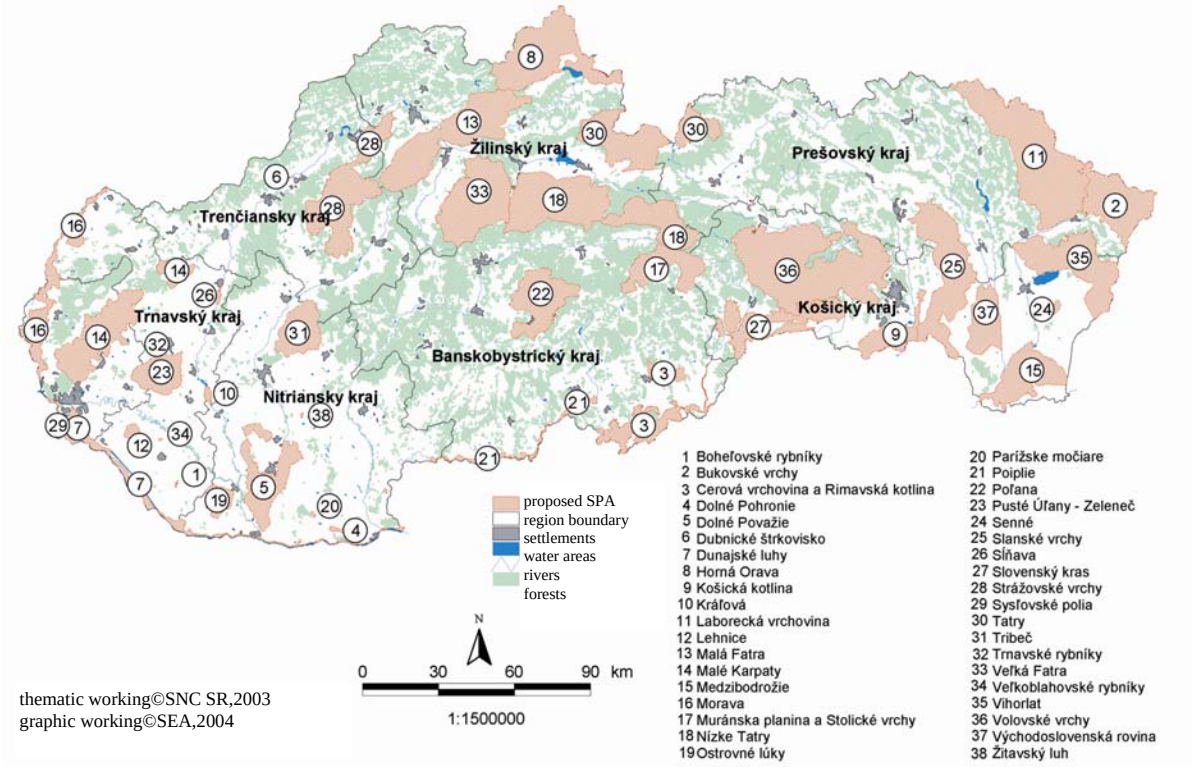
– in 2005, there were negotiations with the European Commission, subsequently Slovakia currently undergoes a revision of the national list of those biotopes and species that were considered insufficiently documented. On this basis the SNC SR drafted a proposal to amend the National SCI Register for missing or under-represented biotopes and species. To the 382 previously proposed Sites of Community Importance were to be added other 304 areas. There are 52 “supplements” (11 864 ha), the other 252 added SCIs only increased the original area by 51 142 ha,
– government proposal for SCI within the Panonian bio-geographical region was adopted by the European Commission in its Decision K(2007)5404 of November 13, 2007 and Decision K(2008)271 of January 25, 2008, adopting a list of Sites of Community Importance in the Alpine bio-geographical region,
– **in 2007** the EU member courtiers, following the Biotope Directive, developed a report on the state of biotopes and species of community importance in terms of their protection. Report on the state of **66 biotopes, 50 plants** and **150 animals** of community importance was prepared by SNC SR in cooperation with the scientific community. Slovak Republic officially sent the Report on 31.10.2007. Of the total number of biotopes and species of community importance, local regions show **19 % in good, 34 % in inadequate, 18 % in bad,** and **29 % in unknown conditions**.

- Special Protection Areas (SPA) - national list of pSPA includes **38 SPA** with total area of **1 236 545 ha** and covers **25.2 % of the SR area** and lapping of pSPA with the existing network of protected areas in the SR presents 55.15 %.

The Slovak Government approved the SPA national list on July 9, 2003. In 2004 began the process of creating resolutions and care programmes for individual special protection areas. As of the end of 2006, there **were declared 5 SPAs** by a single resolution: **Horná Orava, Malé Karpaty, Lehnice, Sysľovské polia and Dolné Považie**.

State Nature Conservancy of Slovak Republic made draft resolutions for the remaining SPAs and sent them to the SR Ministry of Environment. Over the course of the year 2007, these resolutions were discussed within internal comment proceedings and commented by different Ministries. Individual SPAs conducted an on-going monitoring of birds, focused on determining the occurrence and number of species in individual SPAs.

Approved proposal of the special protection areas



Source: SNC SR

Agricultural and forestland in the NATURA 2000 territories

NATURA 2000	Number	Area (ha)	Agricultural land area (ha)	Share of agricultural land (%)	Forest land area (ha)	Share of forest land (%)
SPA	38	1 236 545	365 102	29.5	655 622	53.0
SCI	382	573 690	54 657	9.5	497 295	86.7

Source: SNC SR

Comparison of the pSCI and pSPA areas in Slovakia with selected countries of EU (2007)

Country	SPA			SCI		
	number	area (km²)	% of country area	number	area (km²)	% of country area
Austria	98	9 744	11.6	168	8 889	10.6
Czech rep.	38	6 936	8.8	858	7 251	9.2
Hungary	55	13 519	14.5	467	13 929	15.0
Poland	124	50 407	16.1	362	28 490	9.1
Slovakia	38	12 236	25.1	382	5 739	11.8
EU-25*	**4 850**	**501 286**	**10.3**	**21 574**	**648 441**	**13.2**

Source: SNC SR

* only terrestrial NATURA 2000 sites

Protected trees

The network of protected trees in 2007 was created by 470 protected trees and their groups including alleys (protected objects). Physically it is represented by 1 289 solitary trees of 67 taxons, including 32 domestic and 35 alien taxons.

There were 290 in the **optimal** state (62 %), 141 were **endangered** (30 %) and 39 **degraded** (8 %) of the protected trees and their groups.

Protected minerals and fossils

Protection of minerals and fossils is regulated by § 32 and § 38 **of Act No. 543/2002 Coll.** on nature and landscape protection and **Decree of MoE SR No. 213/2000 Coll.** on protected minerals and protected fossils and on their social evaluation, which stated the list of protected minerals and protected fossils and their social value.

The list of **protected minerals** includes:

- 12 typological minerals, first time scientifically documented from the Slovak territory,
- 61 significant minerals or rare occurrence in Slovak sites, and having European significance, or minerals with specific morphological shape or trend,
- meteorites found in Slovakia's territory.

The list of **protected fossils** includes:

- 655 typological fossils that represent an irreplaceable, unique material of extinct plants and animals that served to describe the specific taxonomic group for the first time,
- selected groups of fossils with rare occurrence that thanks to their characteristics and degree of preservation are unique testimonies of the evolution of organisms in the Slovak geological past.

The samples of protected minerals and protected fossils are deposit especially in the collections of state nature scientific museums.

Protection of monuments and historic sites *is the summary of activities and measures aimed at the identification, research, documentation, conservation, renovation, restoration, regeneration, use and presentation of cultural heritage monuments and historic sites.*

§ 2 par. 7 of the Act No. 49/2002 Coll. on the Protection of Monuments and Historic Sites

• MONUMENT FUND AND ITS PROTECTION

Monuments and historic sites

Trend in the structure of immovable national cultural monuments (NCM) by types

Categorization of immovable NCM*	Number of cultural monuments							
	2000	2001	2002	2003	2004	2005	2006	2007
Architectural monuments	7 515	7 549	7 612	7 650	7 709	7 738	7 799	7 802
Archaeological monuments	340	342	343	351	354	360	368	369
Historical monuments	1 397	1 398	1 410	1 373	1 405	1 386	1 382	1380
Historical gardens and parks	333	335	337	339	339	340	341	344
Folk architecture monuments	1 821	1 821	1 812	1 784	1 837	1 833	1 823	1 821
Technical monuments	451	458	462	451	449	454	484	496
Art work monuments	818	819	943	947	977	1 005	1 015	1 007
Total	**12 675**	**12 722**	**12 919**	**12 895**	**13 070**	**13 116**	**13 212**	**13 228**

* Presented is the number of monument buildings, which comprise the immovable NCM. Source: MB SR

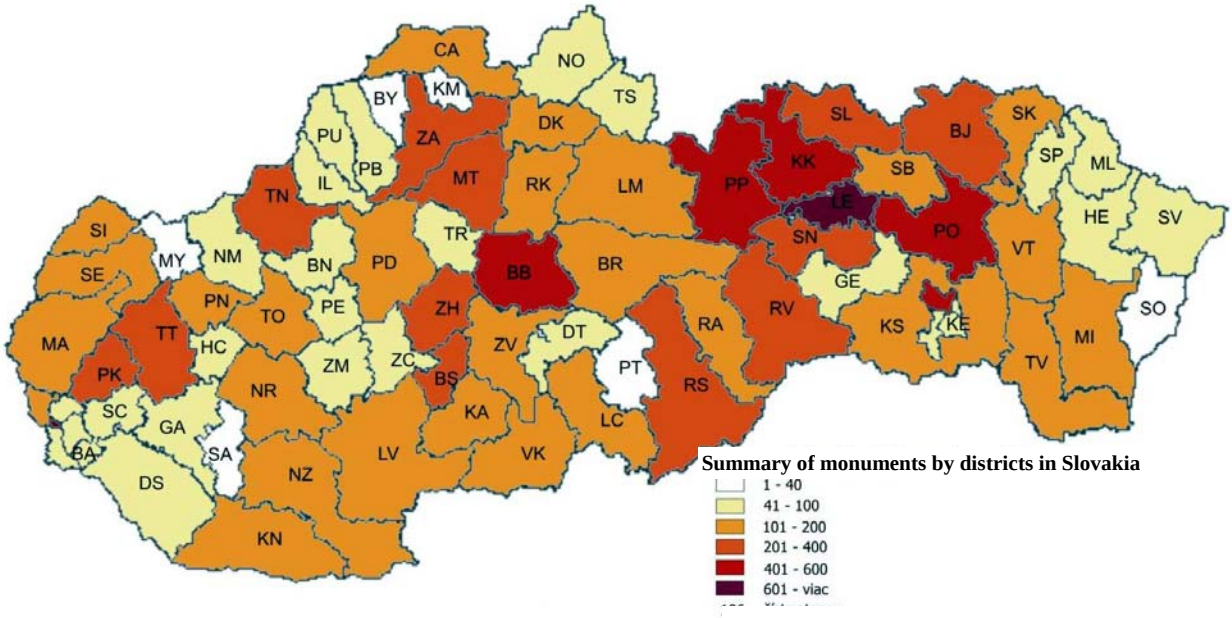
To 31st December 2007, there were 9 539 **immovable national cultural monuments** in Slovakia consisting of **13 228 monument buildings** and **14 459 movable national cultural monuments** (98 % of it has sacral character), which consist of **30 629** cultural articles.

Literary sources point to the past existence of 300 **castles** in Slovakia. Presently, the 9 539 immovable national culture monuments include 109 **castles** and 437 **mansions.**

Monument objects within the NCM in 2007 register:

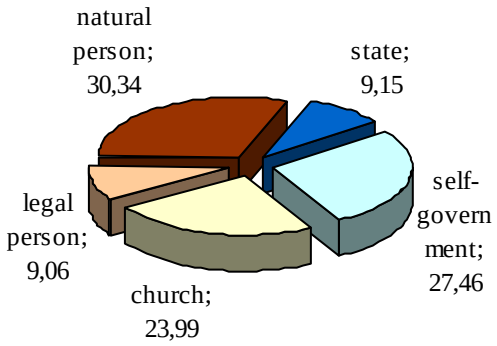
- 536 mansions and family households
- 109 castles
- 82 monasteries
- 1565 churches
- 1 290 people's government houses
- 2 432 manor houses
- 198 palaces and villas
- 616 road sculptures and crosses
- 553 commemorative wall tablets and commemorative sites

Summary of monuments by districts in Slovakia



As of 2007, there were 67 **unused** cultural monuments in Slovakia (according to the MB SR catalogue).

Ownership form of cultural monuments in 2007

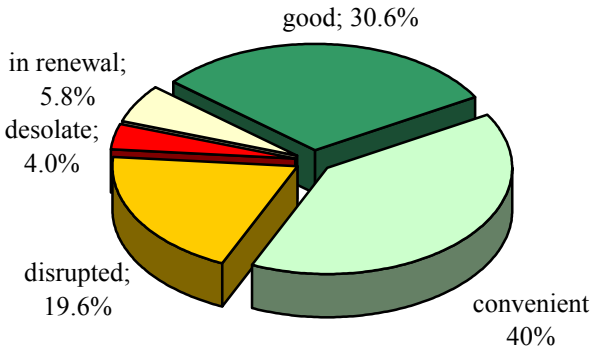


Source: MB SR

In terms of the **construction and technical state,** the year 2007 followed the trend in development since 1993. There is a gradual decrease in the percentage of the "good" state, from 34 % in 1993 went down to 30.6 % in 2007. On the other hand, the percentage of endangered monuments that are disrupted or desolate is also decreasing (from 27 % in 1993 to 23.6 % in 2007). This means that the **state of the majority of monuments moved under the category of convenient,** from 33 % to 40 %.

When added to the monuments in good state, it is 70.6 % of monument fund that is in satisfactory state.

Construction-technical state of immovable NCM in 2007



Source: MB SR

Preservation of monuments in SR is provided by **Act No. 49/2002 Coll. on the protection of monuments and historic sites**.

Besides the preservation of the historical monuments – the objects as solitaires, the monument fund **is also area preserved** in the monument areas: monument reserves and monument zones.

Historical settlement structures in the Slovak republic (2007)

Historical settlement structures (HSS)	Total number of HSS
Town reserves	18
Folk architecture reserves	10
Historical preserved parks	340
Monument zones	85

Source: MB SR

Town reserves

Historical settlement structures		
Town reserves	**Proclamation**	**Number of CM**
1. Banská Bystrica	18.5.1955	200
2. Banská Štiavnica	11.6.1950	191
3. Bardejov	11.6.1950	131
4. Bratislava	5.10.1954	264
5. Kežmarok	11.6.1950	256
6. Košice	2.2.1983	500
7. Kremnica	11.6.1950	116
8. Levoča	11.6.1950	339
9. Nitra	21.1.1981	23
10. Podolínec	11.6.1991	63
11. Prešov	11.6.1950	257
12. Spišská Kapitula	11.6.1950	24
13. Poprad - Sp. Sobota	11.6.1950	89
14. Svätý Jur	23.5.1990	26
15. Štiavnické Bane	15.8.1995	20
16. Trenčín	11.9.1987	112
17. Trnava	11.9.1987	139
18. Žilina	11.9.1987	58

Source: MB SR

Folk architecture reserves

Historical settlement structures		
Folk architecture reserves	**Proclamation**	**Number of CM**
1. Brhlovce	14. 9. 1983	25
2. Čičmany	26. 1. 1977	36
3. Osturňa	3. 10. 1981	135
4. Plavecký Peter	23. 5. 1990	28
5. Podbiel	14. 9. 1977	56
6. Sebechleby	21. 1. 1981	89
7. Špania Dolina	10. 1. 1979	83
8. Veľké Leváre	21. 1. 1981	25
9. Vlkolínec	26. 1. 1977	73
10. Ždiar	14. 9. 1977	183

Source: MB SR

Restoration of cultural monuments

In 2007, there was 109 674 thous. SKK in contributions by the MoC SR to the restoration of national cultural monuments in the SR within **389 projects.** The funds came from the **programme "Let us renovate our house".** It is a complex development programme that supports renewal of national cultural monuments.

Contributions of MoC SR for the restoration of national cultural monuments from the programme "Let us renovate our house"

	2003	2004	2005	2006	2007
Number of projects	160	920	323	513	389
Total funding (thousands SKK)	24 000	118 380	94 648	116 335 000	109 674 000

Source: MB SR

The ministry on its own initiative, on initiative of the The Monuments board or on initiative of any individual or any corporation, can propose a cultural monument or monument areas for ***inscription in the World Heritage List*** *on conditions specified in the international agreement (Convention concerning the Protection of World Cultural and Natural Heritage)*

§ 21 par. 1 of the Act No. 49/2002 Coll. on the Protection of Monuments and Historic Sites

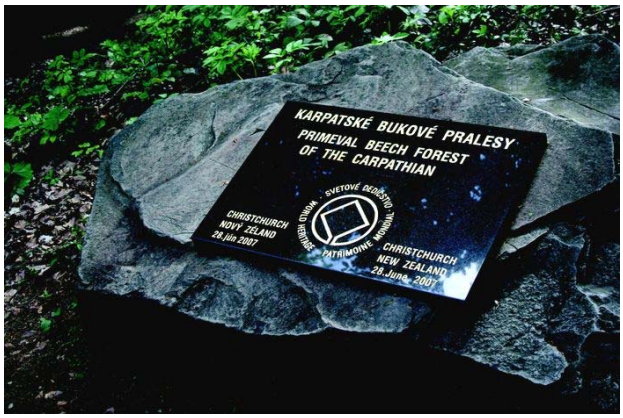
• SLOVAK CONTRIBUTION TO THE WORLD HERITAGE

Sites enlisted under the World Heritage List

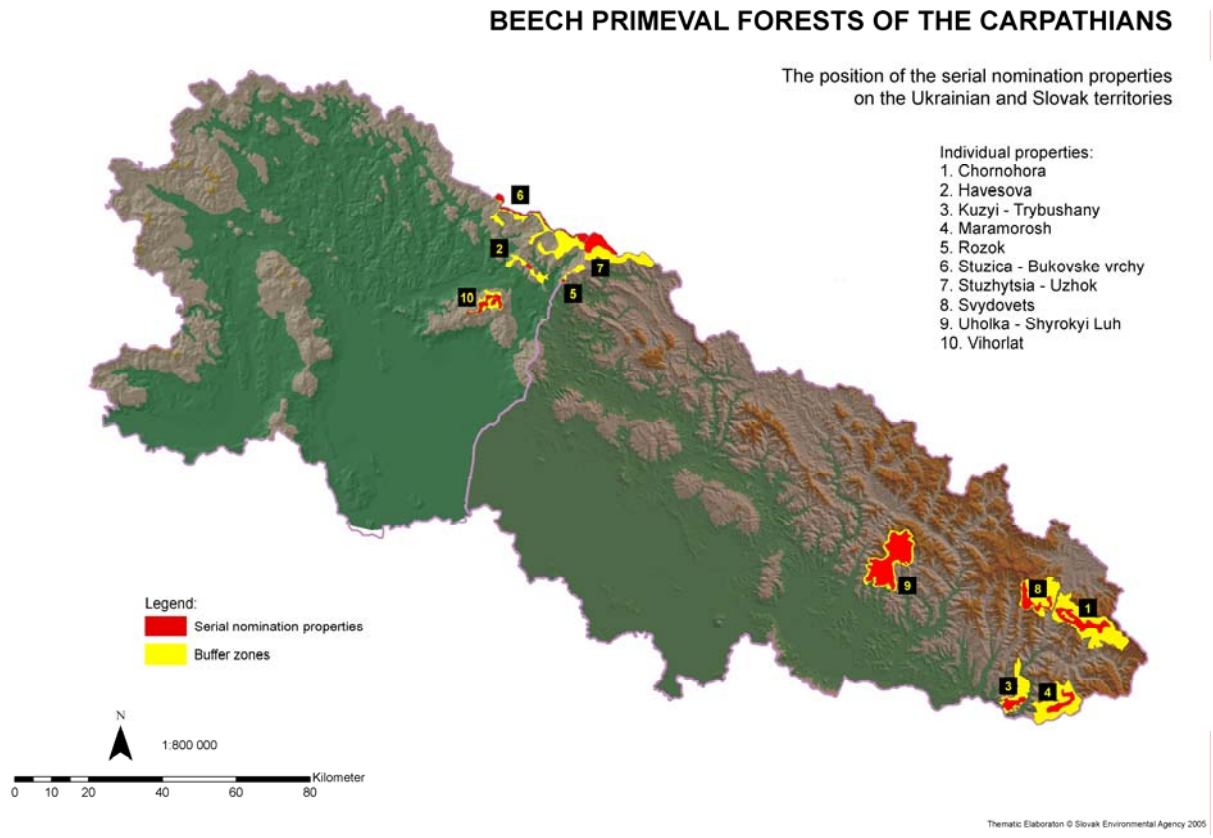
In 2007, the **World Heritage List** contained **878** sites (including 679 cultural, 174 natural, and 25 mixed) from **145** signatory countries to the *Convention concerning the protection of World culture and natural heritage*.

On June 28, 2007 the World heritage committee in Christchurch (New Zealand) put a new Slovak site on the World Heritage List – **Beech primeval forests of the Carpathians** (bilateral project together with Ukraine). In Slovakia, we register more than 70 primeval forest reservations, of which four (**Havešová, Rožok, Stužica, and Vihorlat**) were added into world nature heritage. The site comprises the **core zone** (29 278.9 ha including 5 766.4 ha in SR) and the **buffer zone** (48 692.7 ha / 13 818.4 ha in SR).

This is a globally significant nature gene pool of the beech tree that represents the most significant tree type of the northern mild European zone, as well as a unique nature laboratory of global significance. Beech primeval forests of the Carpathians as part of the World nature heritage will now begin to remind the whole humanity of the still existing possibility of returning to the equilibrium.



Location of sites of the trans-boundary series of Carpathian beech primeval forests



On July 7, 2008 in Quebec, another Slovak site was added on the World heritage list – **„Wooden churches in the Slovak part of the Carpathian arch"**. These represent a group of nine wooden objects – eight churches and one (detached) bell tower – of three confessions, dating back to the 16-18th centuries: *Roman-catholic churches in* ***Hertvanovo*** *and* ***Tvrdošín,*** *Lutheran articular churches in* ***Kežmarok, Leštiny*** *and* ***Hronsek*** *(church and bell tower), and churches of the eastern office in* ***Bodružal, Ladomírová*** *and* ***Ruská Bystrá.*** Original wood architecture in the Carpathian arch is considered by the World heritage committee an „important example of rich local tradition of religious culture, where the Latin (western) and the Byzantine (eastern) cultures meet. Meanwhile, it represents a symbiosis of folk and professional architecture and reflects the context of the time of its creation.

In Slovakia, **seven sites** were put on the World Heritage List **as of 2007/2008**.

Under cultural heritage:

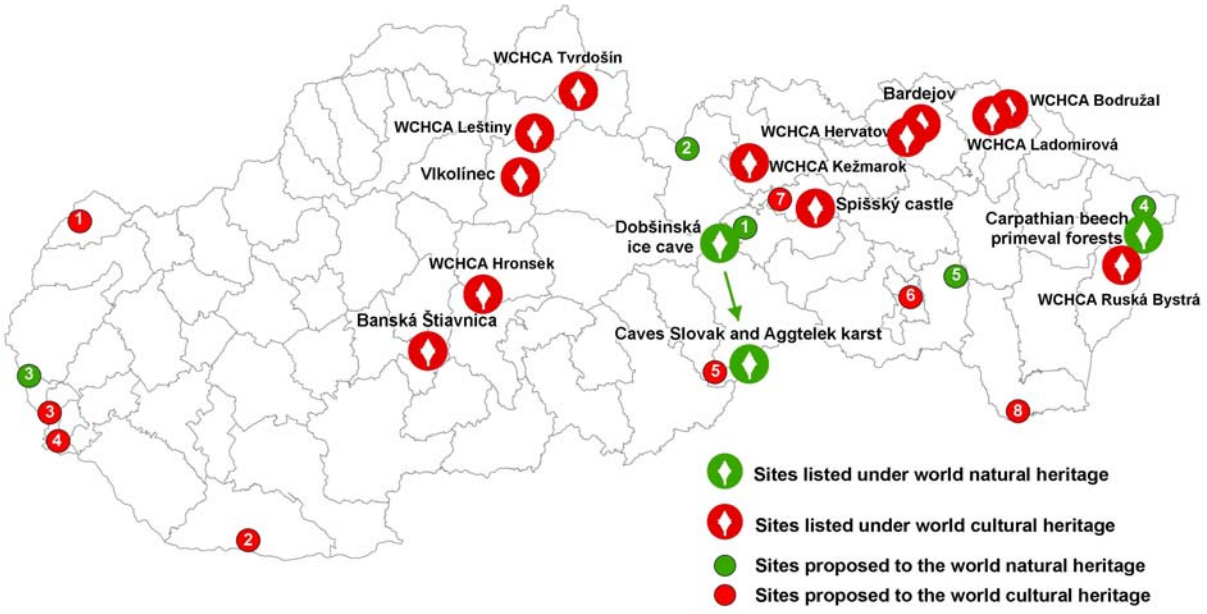
- **Vlkolínec** Folk Architecture Reserve, local district of Ružomberok (Cartagena, 1993),
- **Spišský castle** and cultural monuments in its surroundings in protective zone of NCM - Spišská Kapitula, Spišské Podhradie, Church of the Holy Ghost in Žehra (Cartagena, 1993),
- **Banská Štiavnica** with neighbouring technical monuments (Banská Štiavnica, Hodruša–Hámre, Štiavnické Mines, Banská Belá, Voznica, Vyhne, Banský Studenec, Počúvadlo, Kopanica, Kysihýbel, Antol, Ilija; especially 23 water dams - tajchas) (Cartagena, 1993),

- Historical Town Reserve of **Bardejov** also with the protective zone**,** including the Jewish suburb (Cairns, 2000),
- **Wooden churches** of the Slovak part of the Carpathian arch (wooden churches - Hervatov, Tvrdošín, Leštiny, Kežmarok, Hronsek, Bodružal, Ladomírová, Ruská Bystrá) (Quebec, 2008).

Under natural heritage:

- **Caves of the Slovak and Aggtelek karts** (Berlín, 1995), to which was added **Dobšinská ice cave** in 2000, including Stratenská cave and Psie diery cave as a one cave system in Duča hill (Cairns, 2000),
- **Beech primeval forests of the Carpathians** (Christchurch, 2007) together with Ukraine.

World cultural and natural heritage in the SR



Source: SEA

Comparison of the number of World Heritage sites (WH) with the surrounding countries to 2007

Country	Number of WH sites (cultural/natural)
Slovakia	6 (4/2)
Czech Republic	12 (12/0)
Poland	13 (12/1)
Hungary	8 (7/1)
Austria	8 (8/0)

Source: UNESCO

Sites proposed to be placed on the World Heritage List

The **proposed sites** to be placed **on the list for nomination to the world heritage** to 2007 include:

Under cultural heritage

1. **Great Moravian settlements:** Slavic fortification complex in Mikulčice and the St. Margaret Church in Kopčany,
2. **Komárno – fortification against the Turks** (together with Hungary),
3. **Monument to Chatam Sófer** in Bratislava,
4. **Limes Romanus – Roman monuments on the middle Danube** (together with Austria, Hungary, in Slovakia only Iža and Rusovce),
5. **Gemer and Abov churches with medieval wall paintings** (planned project with Hungary),
6. **Historic Centre of Košice** (lens-shaped square),
7. **Monuments and landscape of Spiš** (the area around Spišský castle and the surrounding world heritage monuments – with added historical centre of Levoča and the work of the Master Paul),
8. **Tokay vineyard area** (Černov, Veľká Tàňa, Malá Tàňa, Slovenské Nové Mesto, Černochov, Bara, Viničky; inclusion into the Tokay vineyard area in Hungary).

Under nature heritage

1. **Original meadow pastures** in Slovakia,
2. **Nature reserves of the Tatras** (together with Poland),
3. **Nature and cultural landscape in the sub-Danubian region** (anticipated common proposal with the Czech Republic),
4. **Mycoflora of the Bukovské hills**,
5. **Geyser in Herľany**.

Spatial planning *systematically and comprehensively solves the spatial arrangement and functional use of the territory, sets it principles, proposes the material and time coordination of activities influencing the environment, ecological stability, cultural and historical values of the territory, regional development and landscape formation in line with the principles of sustainable development.*

§ 1 of the Act No. 50/1976 Coll. on Spatial Planning and Building Order (Building Act) as subsequently amended

• SPATIAL DISTRIBUTION AND FUNCTIONAL USE OF TERRITORY

Settlement and demographic trend

Since 2003, there has been a rising trend in reproduction potential, birthrate is increasing, number of abortions have dropped, and the number of immigrants has also increased. **Total increament** compared to the previus year was 7 361 inhabitants, mainly due to immigration. As of December 31, 2007, population count in the Slovak Republic reached the number of **5 400 998**. There was **natural increment** in population count, which builds on the positive trend from 2004 that was preceded by a three-year reduction. (2001-2003).

Basic data about the migration of population in the SR (2007)

Territory	Live births	Dead	Natural increment (loss)	Migration increment (loss)	Total increment (loss)	Number of inhabitants (to 31st December 2007)
Bratislavský region	6 325	5 771	554	3 543	4 097	606 753
Trnavský region	4 904	5 635	-731	2 807	2 076	555 075
Trenčiansky region	5 214	6 074	-860	844	-16	599 847
Nitriansky region	6 067	8 059	-1 992	1 445	-547	707 305
Žilinský region	7 021	6 666	355	17	372	695 326
Banskobystrický region	6 323	7 230	-907	-187	-1 094	655 762
Prešovský region	9 489	6 884	2 605	-1 149	1 456	800 483
Košický region	9 081	7 537	1 544	-527	1 017	773 086
Slovak Republic	**54 424**	**53 856**	**568**	**6 793**	**7 361**	**5 400 998**

Source: SO SR

Demographic trend of the 90-ties and the beginning of this century in Slovakia reflects changes that occur in the economic, social, and political transformation of the society.

Structure of the settlement in the SR (to 31st December 2007)

Territory	Area (km²)	Number of inhabitants per km²	Number of independent municipalities	Average number of inhabitants per municipalities	Urbanization level (%)	
					Urban area	Rural area
Bratislavský region	2 053.2	297.5	73	8 311.7	83.19	16.81
Trnavský region	4 146.7	134.4	251	2 211.5	48.98	51.02
Trenčiansky region	4 502.2	133.2	276	2 173.4	56.99	43.01
Nitriansky region	6 343.8	111.4	354	1 998.0	46.99	53.01
Žilinský region	6 808.7	102.2	315	2 207.4	50.50	49.50
Banskobystrický region	9 454.7	69.2	516	1 270.9	53.55	46.45
Prešovský region	8 973.7	89.4	666	1 201.9	49.49	50.51
Košický region	6 752.5	114.6	440	1 757.0	55.97	44.03
Slovak Republic	**49 035.4**	**110.1**	**2 891**	**1 868.2**	**55.21**	**44.79**

Source: SO SR

Index trend in the SR area structure

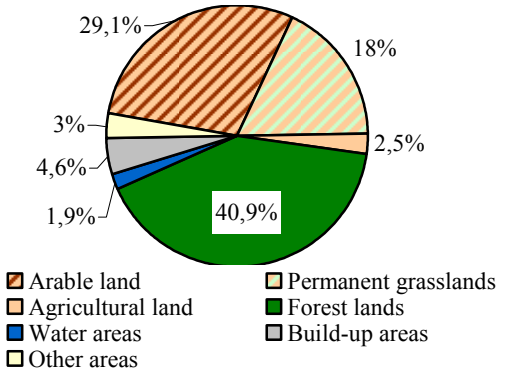
SR is the balanced mosaic composed from the urbanized settlements environment, agricultural and forest countryside, which plays also the production and restoration function for small and larger settlements in Slovakia. Within transformation of the national economy there continually comes to **natural shift of land** between agricultural and forest land and other land categories.

Overall land categories to 31st December 2007 (ha)

Region	Arable land	Hop-field	Vineyard	Gardens	Orchards	Permanent grasslands	Agricul. land	Forest lands	Water areas	Built-up areas	Other areas	Total area
BA	74 750	-	4 618	4 551	982	9 904	94 805	75 245	5 777	15 679	13 809	205 315
TT	263 002	129	4 293	8 210	2 461	14 712	292 808	65 266	14 713	27 517	14 365	414 669
TN	98 119	365	68	8 117	2 600	76 783	186 053	220 582	6 334	23 241	14 007	450 216
NR	407 196	36	12 133	14 201	5 054	30 479	469 098	96 229	15 704	37 777	15 577	634 384
ZA	62 896	-	-	6 123	404	176 315	245 738	379 932	12 799	25 094	17 308	680 872
BB	166 576	-	3 304	11 128	1 849	235 342	418 199	462 607	7 892	33 129	23 640	945 467
PR	149 217	-	23	10 829	2 116	111 268	384 453	440 624	14 138	31 365	26 820	897 401
KE	204 139	-	2 804	13 560	2 124	115 118	337 745	266 657	16 299	34 128	20 418	675 248
Total	**1 425 896**	**530**	**27 243**	**76 720**	**17 590**	**880 920**	**2 428 899**	**2 007 142**	**93 656**	**227 931**	**145 945**	**4 903 573**

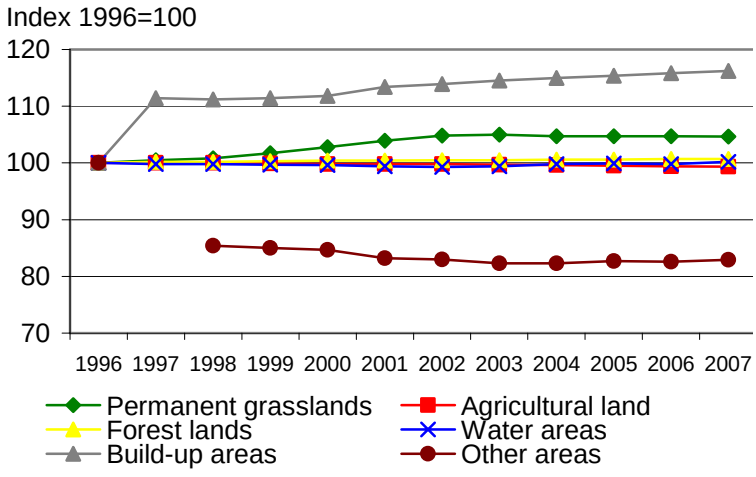
Source: IGCC SR

Areas structure in the SR (2007)



Source: IGCC SR

Index trend in areas structure of SR



Source: IGCC SR

Green in the residential areas

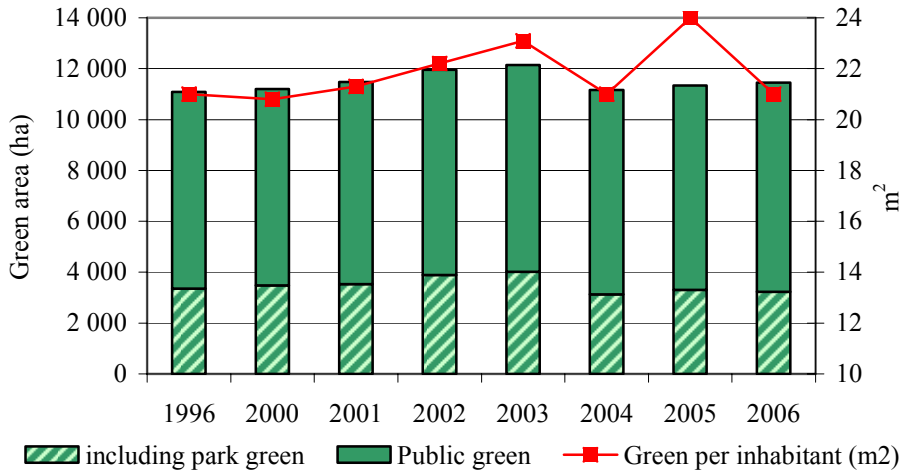
As of **2006,** areas of municipal green in the SR reached **11 449 ha,** including 3 228 ha of park green areas. Its share per one inhabitant was **21 m^2**.

Area of municipal green of the SR by regions (2006)

Region	Public green (ha)		including park green (ha)		Green per inhabitant (m^2)	
	towns and villages	including towns	towns and villages	including towns	towns and villages	including towns
BA	1 153	921	335	239	19	18
TT	1 329	702	389	137	24	26
TN	1 149	887	333	194	21	26
NR	1 952	967	606	190	28	29
ZA	1 199	743	242	114	17	21
BB	1 569	977	468	304	24	28
PR	1 350	861	376	202	17	22
KE	1 649	1 047	479	209	21	24
Total	**11 449**	**7 105**	**3 228**	**1 589**	**21**	**24**

Source: SO SR

Trend of public green in SR



Source: SO SR

Spatial planning

Main document of spatial planning in the Slovak Republic is the Strategy of Spatial Development of Slovakia, which looks over the horizon of 15 to 20 years. **The Conception of Spatial Development of Slovakia 2001 (KURS 2001)** was approved by the SR Government. Ministry of construction and regional development of the SR that elaborates the strategy is also responsible for its periodical revisions.

KURS 2001 is a physical planning documentation of the national

importance. Objectives of physical planning strategy mentioned in the documentation form the basic framework and give direction for the Slovak spatial development within international and national domains. In their recommendations, the strategy fully follows the outcomes of the European spatial concepts – building on their objectives and creatively applying them for the Slovak conditions.

In 2006, Slovak Ministry of Construction and Regional Development oversaw the revision of the directive part of the Conception of Spatial Development of Slovakia 2001.

Since 2002, self-governing regions elaborate territorial plans **on the regional level.** Municipalities are responsible for activities related to spatial planning at the **local level.** Pursuant to the Building Act, any municipality with more than 2 000 inhabitrants must develop and approve the **municipal territorial plan.**

Subsidies from the Ministry budget to create physical-planning documentation of municipalities:

- year 2006 total 1 mil. SKK (7 municipalities)
- year 2007 total 1.9 mil. SKK (16 municipalities).

Summary of the number of physical-planning documentation (ÚPD) in Slovakia as of January 31, 2007

	Municipalities over 2001 inhabitants		Municipalities of 1001 to 2000 inhabitants		Municipalities of up to 1000 inhabitants	
Number of municipalities	14 %	412	19 %	562	67 %	1 948
Municipalities without ÚPD	4 %	18	33 %	188	71 %	1 381
Municipalities with ÚPD under preparation	28 %	114	-	-	-	-
Municipalities with approved ÚPD	68 %	280	67 %	374	29 %	567

Source: MoCRD SR

European Landscape Convention

European Landscape Convention (ELC) as the Council of Europe's Convention **focuses on landscape protection, management, landscape planning, and organisation of European cooperation in this area**.

It became effective on March 1, 2004. On December 31, 2006, other 26 Council of Europe member countries acceeded to it or ratified it, and 8 other member countries signed the Convention.

The Convention was signed in Slovakia on May 30, 2005, its ratification took place on August 9, 2005. **The Convention became effective in Slovakia on December 1, 2005**.

As of December 31, 2007, there were 35 countries acceding to the Convention, 29 countries ratified it, and 28 Council of Europe countries put it in effect.

MoE SR is the competent authority for coordination and management of obligations and cooperation with the affected ministries within the ELC in Slovakia, including the Ministry of Construction and Regional Development SR, Ministry of Culture SR, and Ministry of Agriculture SR. **SEA** (Slovak Environmental Agency) is the executive authority for the MoE SR.

In 2007, Slovakia **was meeting** the Programme of implementation of the European Landscape Convention. Programme of implementation of the ELC In Slovakia is structured into **four main pillars:**

- **Institutional support –** goal is to secure implementation and to prepare of legislation related to nature protection,
- **Promotion –** goal is to campaign, work with the public, cooperate with the media, and educate professional public and municipalities,
- **Cooperation –** goal is to secure cooperation on the national and international levels,
- **Professional support –** goal is to identify types of landscape, typical landscape character, major landscape elements, goal landscape quality, etc.

Assessment of implementation of the European Landscape Convention in 2007:

In 2007, within the implementation of the European Convention and its promotion, an informative brochure on the "*European Landscape Convention in Slovakia*" was published in both Slovak and English, as well as promotional posters that presented the values of the Slovak landscape. International conference called „*Landscape--Man--Culture*" was organized, focusing on its central topic of "Landscape protection is the thing of us all". The Conference is organized every year as part of the international environmental films festival – Envirofilm.

Village Renewal Program

Village Renewal Program (VRP), over ten years of its existence showed, that is one of the popular and successful instruments for rural development in developed European countries. Countries and regions that are part of the European working community for village renewal and rural development (with headquarters in Vienna) have been applying this instrument for more than 20 years. **Slovakia** has

been a member of this community through its Ministry of Environment since 1997, and has been implementing this Program since 1998.

Main objective of the VRP is to create organisational and economic conditions to foster activities and support urban and rural populations to improve their environment, preserve natural and cultural values of rural landscape, and to develop environment-friendly management of domestic resources. This is implemted by **SEA,** that receives applications from local governments and rural micro-regions to support their activities through its counselors and secretariat for VRP, organises a national contest called The Village of the Year, and officially represents the Resort before international organisations.

Beside the indirect support, the Program also provides for **financial form of government support** - this is a system of small subsidies, typically several tens of thousand SKK per municipality.

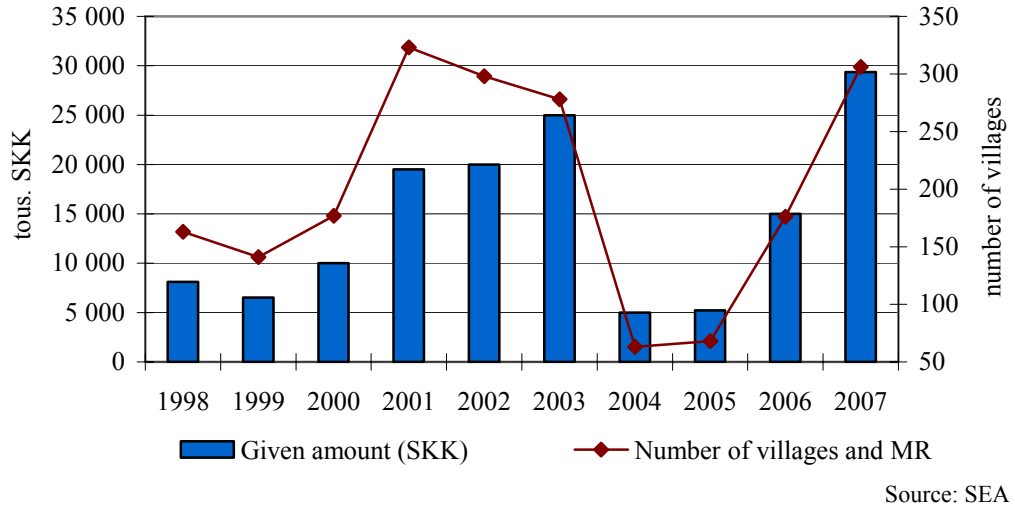
In 2007, the VRP support reached total volume of **29.37 mill. SKK**. Subsidy categories were adjusted to take into consideration the preferences of the Ministry of Environment.

Total overview of allocating the subsidies to VRP in 2007 (SKK)

1/ studies, project documentations and SD programmes *		2A/ small realizations		2B/ edification and advertising		Total of 1 - 2	
Number of villages and MR**	Given amount	Number of villages and MR	Given amount	Number of villages and MR	Given amount	Number of villages and MR	Given amount
107	10 435 000	179	16 486 000	20	2 449 000	**306**	**29 370 000**

* SD – sustainable development ** MR – micro-regions Source: SEA

Trend of allocating the subsidies to VRP



Source: SEA

Overview of allocating the subsidies to VRP

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	1998 - 2007
Total subsidies (thous. SKK)	8 100	6 500	10 000	19 500	20 000	25 000	4 996	5 230	14 990	29 370	**114 316**
Average allocation (SKK)	49 693	46 099	56 497	60 372	67 114	87 108	79 302	76 912	85 170	95 980	**67 585**

Number of applications	794	766	718	858	910	1 091	899	699	775	721	**7 510**
Number of allocations	163	141	177	319	298	278	63	68	176	306	**1 683**
% of satisfied application	20.5	18.4	24.7	37.2	32.7	25.5	7.0	9.7	22.7	42.4	**22.4**

Source: SEA

Every two years since 1990, *European Working Community for Rural Development and Village Renewal* (ARGE) organises a competition for the **"European Award for Village Renewal"**. For the first time ever, in 2002, Slovakia sent its representative – winner of the national competition called **„Village of the Year".** It was the Soblahov village from the district of Trenčín, while in 2004 it was the village of Hrušov from the district of Veľký Krtíš that had won the competition in 2003 and in 2006 it was the village of Vlachovo from the district of Rožňava that had won the competition in 2005.

There were 20 villages from the whole of Slovakia that registered for the competition **in 2007**. Thus, the villages took advantage of this great opportunity to present their achievements, beauties, and uniqueness of the Slovak village.

The village of **Liptovská Teplička** in the district of Poprad became the winner of the competition **"Village of the Year 2007"**. In 2008, this village will represent Slovakia in the competition for the European Award for Village Renewal.

*The territory cannot be burdened by human activities over the bearable limit of load. The admissible **level of environment pollution** is given by threshold limits, specified by special regulations; these limits shall be specified in accord with the stage of knowledge, so that neither health of people, nor other living organisms and other elements of environment are threatened.*

§ 11 of the Act No. 17/1992 Coll. on Environment

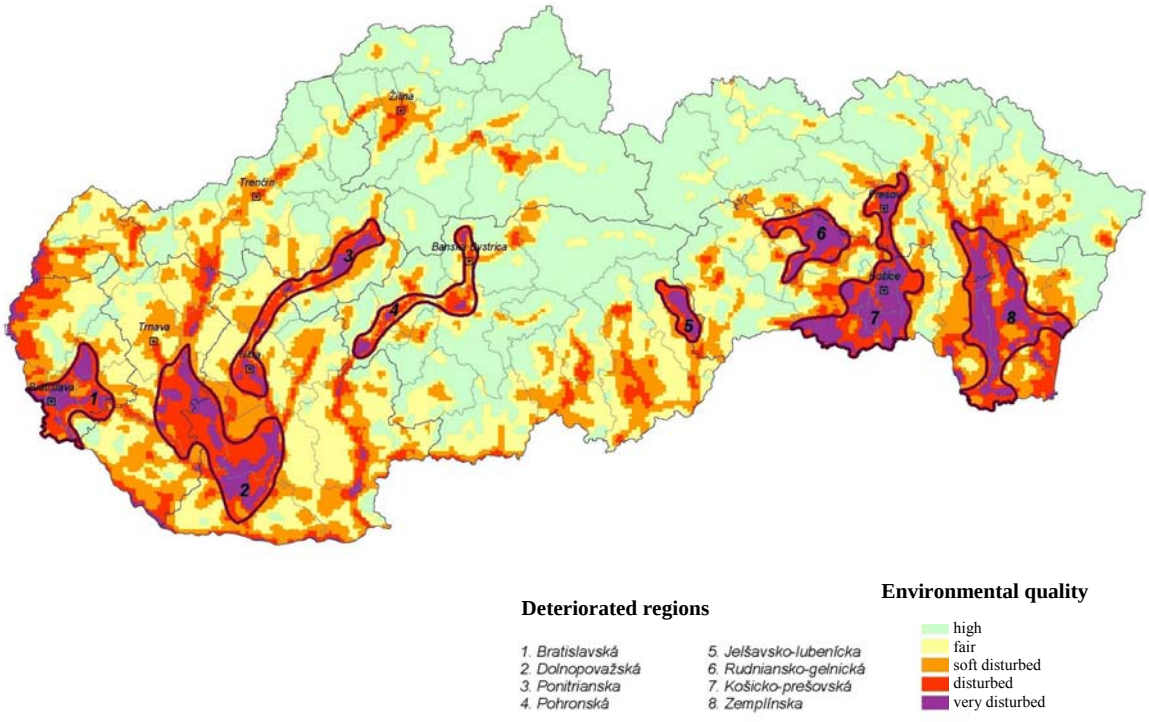
ENVIRONMENTAL REGIONALISATION

• ENVIRONMENTAL REGIONALISATION OF SLOVAKIA

Environmental regionalisation of Slovakia represents a cross-sectional source of information on the state of environment and reflects differentiated state of environment in different parts of the country. Regions show varying degree of individual environmental loads and also show different risk factors. These impacts, loads, or hazards show (along with a variety of natural conditions) mainly anthropogenic characteristics.

One of the final outputs is a map that evaluates the Slovak territory in 5 degrees of quality of environment, which is the basis for identification of areas with the greatest **environmental load.**

Quality of the environment and the loaded areas



Source: SEA

Differentiation of the SR territory by quality of environment

Quality of environment	Size (km)	% of SR size (49 034 km^2)
1 – high-quality environment	19 661	40.0
2 – suitable environment	12 580	25.7
3 – slightly damaged environment	9 055	18.5
4 – damaged environment	5 296	10.8
5 – heavily damaged environment	2 442	5.0

Source: SEA

Basic parameters of the loaded areas (LA)

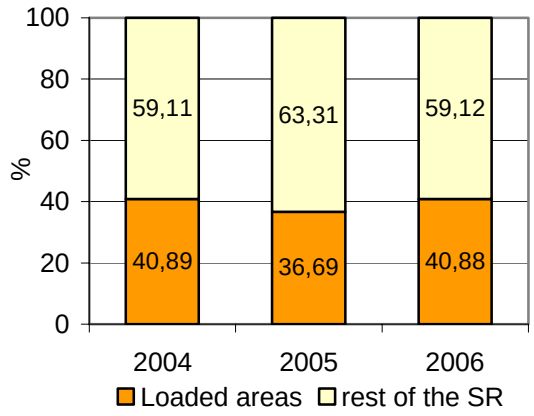
LA	Area* (km^2)	Number of inhabitants	Location of ZO in the region – proportion in %
Bratislavská	488	432 000	Bratislavský 93 %, Trnavský 7 %
Dolnopovažská	1 261	247 000	Nitriansky 66 %, Trnavský 34 %
Ponitrianska	450	272 000	Nitriansky 51 %, Trenčiansky 49 %
Pohronská	203	186 000	Banskobystrický 100 %
Jelšavsko-lubenícka	137	21 000	Banskobystrický 100 %
Rudniansko-gelnická	357	52 000	Košický 95 %, Prešovský 5 %
Košicko-prešovská	1 044	425 000	Košický 81 %, Prešovský 19 %
Zemplínska	1 040	173 000	Košický 83 %, Prešovský 17 %
Total	**4 980**	**1 808 000**	

** The territory includes areas in the 5th and 4th degrees of environmental quality.* Source: SEA

Loaded areas represent approximately 10 - 11 % of the SR territory. The charts show the fact that in the area of air pollution, water contamination, and waste generation that have significantly contributed to the state of environment in the territory; and most indicators show that the loaded areas bear 50 – 90 % of environmental load in Slovakia documented by individual indicators.

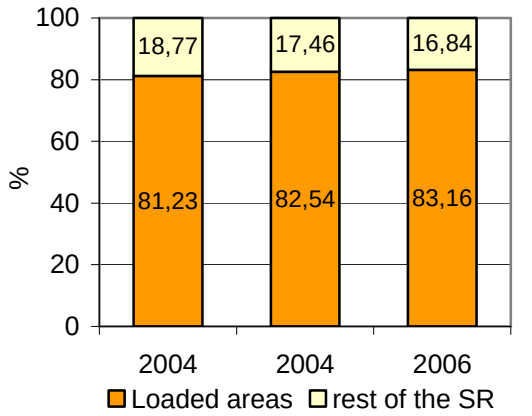
Air

PM emissions from stationary sources in LA



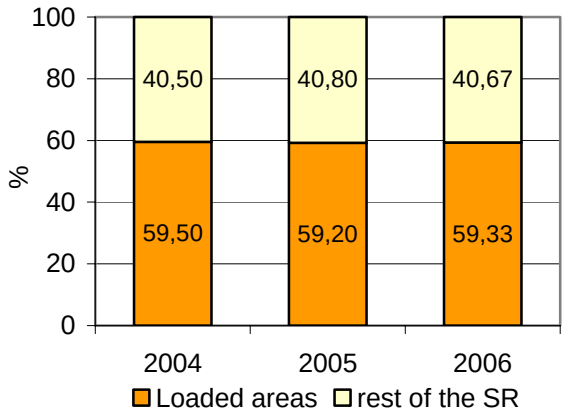
Source: SHMI

SO_2 emissions from stationary sources in LA



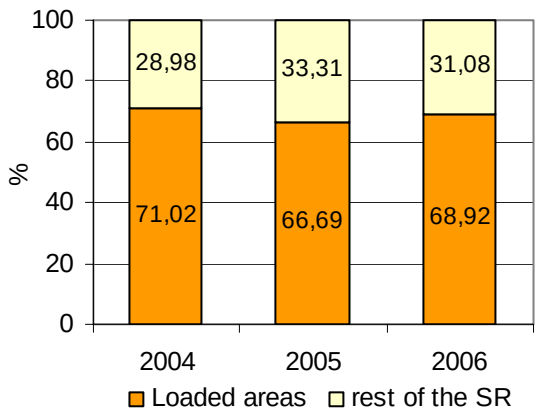
Source: SHMI

NO_X emissions from stationary sources in LA



Source: SHMI

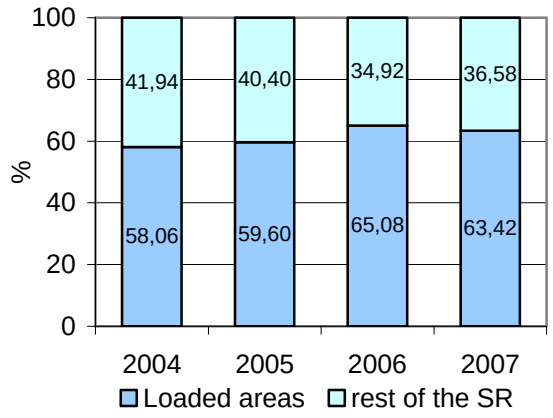
CO emissions from stationary sources in LA



Source: SHMI

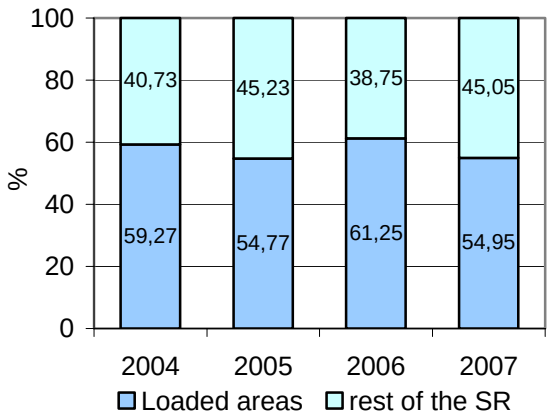
Water

Discharged BOD_5 contamination in LA



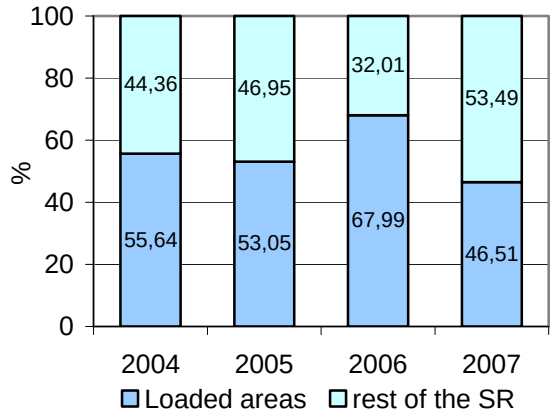
Source: SHMI

Discharged COD_{Cr} contamination in LA



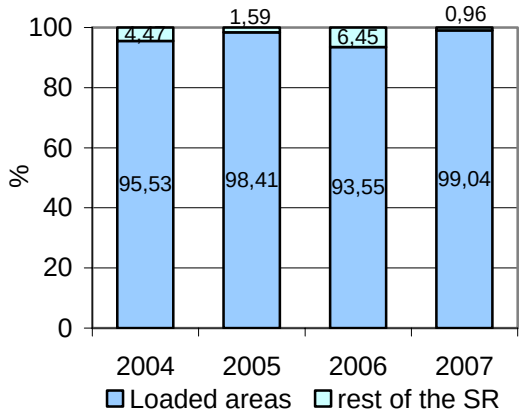
Source: SHMI

Discharged IS contamination in LA



Source: SHMI

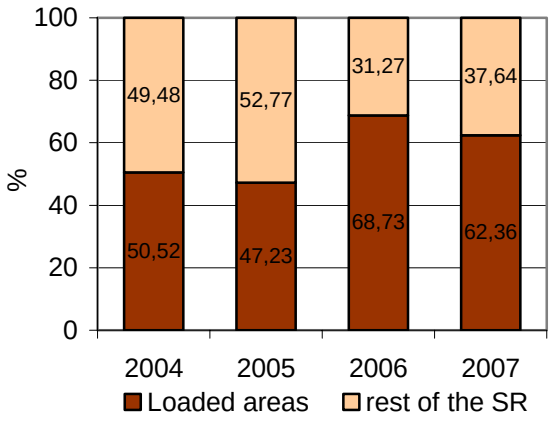
Discharged ENP_{UV} contamination in LA



Source: SHMI

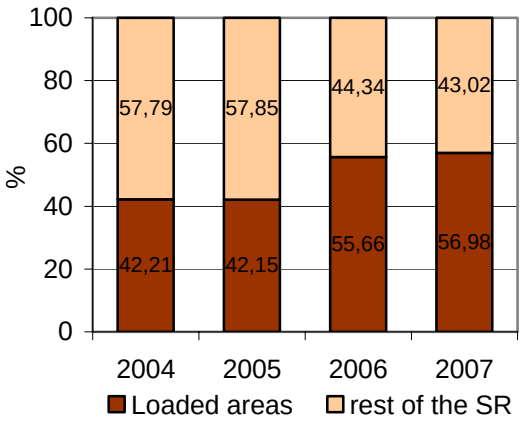
Waste

Other waste generated in LA



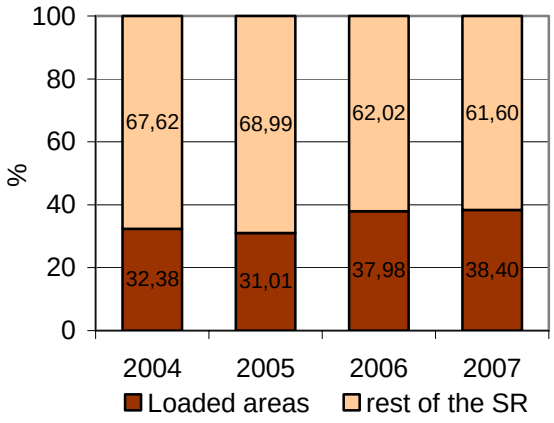
Source: SEA

Hazardous waste generated in LA

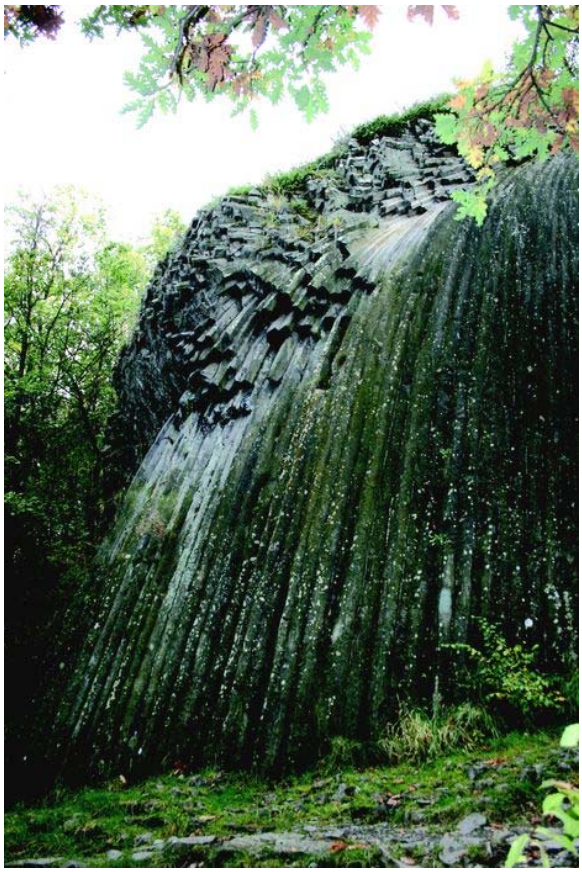


Source: SEA

Municipal waste generated in LA



Source: SEA



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§ 11 of the Act No. 17/1992 Coll. on Environment

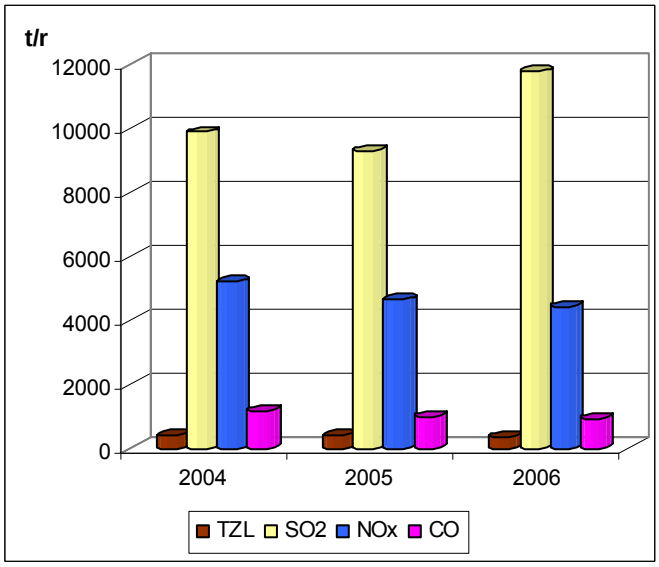
• LOADED AREAS

The Bratislava loaded area

♦ **Air pollution**

Large and middle-sized industrial sources of petrochemical, fuel-energy, and automobile industries are the main contributors to air pollution. Extensive construction activity and the related demolition, excavation and construction works represent another significant air-pollution source, along with an increasing concentration of road traffic.

Emission volumes in Bratislava loaded area



t/r – tons/year
TZL – PM

Source: SHMI

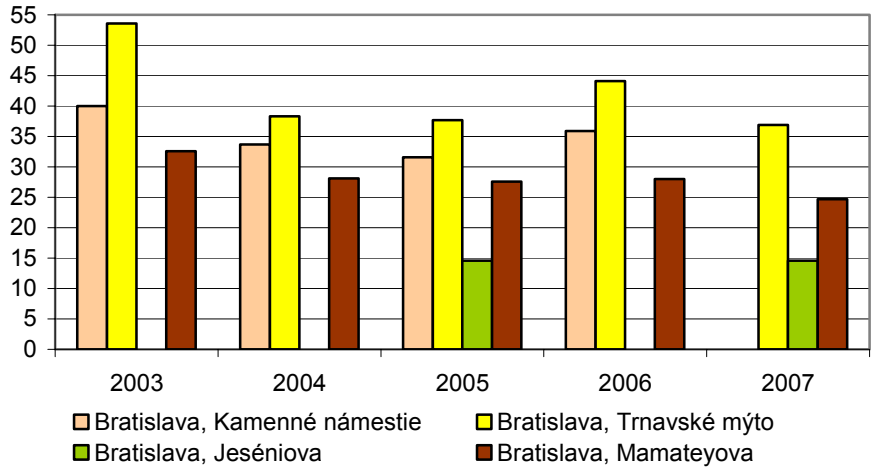
Assessement of air pollution by the limit values for human health protection, and limit values increased by the tolerance threshold (TT) for the year 2007 at the monitoring stations in Bratislava loaded area

	Health protection													VHP [2]	
Pollutant	**SO_2**		**NO_2**		**NO_2+MT**		**PM_{10}**		***PM_{10}**		**CO**	**Ben-zene**	**Ben. +MT**	**SO_2**	**NO_2**
Averaging period	1 hour	24 hour	1 hour	1 year	1 hour	1 year	24 hour	1 year	24 hour	1 year	8 hour [1]	1 year	1 year	3 hour Floating average	3 hour Floating average
Limit value [µg.m^{-3}]	350	125	200	40	230	46	50	40	50	40	10000	5	8	500	400
(number of exceeding measurements)	*(24)*	*(3)*	*(18)*		*(18)*		*(35)*		*(35)*						
Bratislava, Kamenné nám.							16	22.8	7	21.0					
Bratislava, Trnavské mýto			0	36.9	0	36.9	**38**	29.1	24	25.9	1910	1.7	1.7		0
Bratislava, Jeséniova			0	14.6	0	14.6	23	25.2	20	25.0					
Bratislava, Mamateyova	0	0	0	24.7	0	24.7	26	23.6	22	22.9				0	0

Source: SHMI

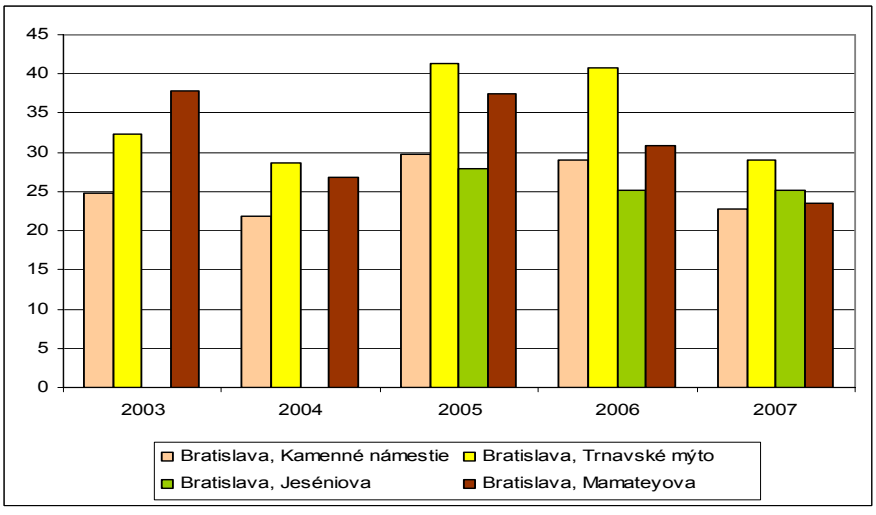
1) maximal eight-hour concentration
2) limit values for the alarm limit thresholds
Pollutants exceeding the limit values are in bold

Trend in annual concentration of NO_2 (µg.m^{-3}) in Bratislava loaded area



Source: SHMI

Trend in annual concentration of PM_{10} (µg.m^{-3}) in Bratislava loaded area



Source: SHMI

Permitted target number for detections of excessive contents of eight-hour ground ozone concentration (120 μg.m^{-3}) was exceeded at Bratislava-Jeséniova and Bratislava-Mamateyova monitoring stations.

Number of measured values exceeding the information threshold (IT) and the alarm threshold (AT) in ground ozone concentrations to inform or alarm the public in Bratislava loaded area

Station	IT_{1h} = 180 μg.m^{-3}					AT_{1h} = 240 μg.m^{-3}				
	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
Bratislava, Jeséniova	42	0	6	11	10	3	0	0	0	0
Bratislava, Mamateyova	32	0	8	19	17	3	0	0	0	1

Source: SHMI

Number of days showing the exceeded average eight-hour O_3 120 μg.m^{-3} ground ozone concentration (target value for protection of human health) in Bratislava loaded area

Station	2005	2006	2007	Average 2005-2007
Bratislava, Jeséniova	52	50	31	44
Bratislava, Mamateyova	42	34	37	38

Source: SHMI

An air-quality management area for the PM_{10} pollutant is designated for the Bratislava metropolitan territory within the loaded area.

♦ **Surface water contamination**

Danube is the major water course in the area. Contributors of water contamination include industrial and municipal waste water, agricultural activities, and ship transport. Qjuality of Danube water in the area has been adversely affected by contamination flowing from its upper feeding stream, Morava. It is mainly the discharged cooling waste water from Slovnaft and the run-off water from towns, that influence the quality of the Malý Danube water.

Surface water quality in the Bratislava loaded area

Water course	Sampling site	Number of assessed or detected indicators	Indicators not complying with SR GO No. 296/2005 Coll. of total number of assessed indicators	
			Number	%
Danube	Karlova Ves	39	6	15
	Bratislava left bank	33	3	18
	Bratislava centre	50	5	10
	Bratislava right bank	32	3	9
	Rajka	29	6	21
Malý Danube	Bratislava	21	3	14
	Malinovo	16	1	6

Source: SHMI

♦ **Ground water contamination**

Groundwater quality for the affected area has been monitored in 2 groundwater formations - in quaternary sediments and in 2 formations of groundwater inside pre-quaternary rocks.

Limit values in comparison with requirements of the SR Government Ordinance 354/2006 Coll. in 2007 were exceeded in both groundwater formations inside quaternary sediments extending into the affected area. The most frequently exceeded indicators include total Fe, Mn, and nitrates. Limit values for heavy metals were exceeded for the categories of Al and As.

The area still shows an adverse situation in ground water contamination by sulphates, nitrates, chlorides, heavy metals, and specific organic compounds. This has been been caused mainly by a heavy concentration of chemical and petrochemical industries, and a dense population.

♦ **Sources of water contamination**

Major sources of water contamination and contamination discharged to surface water within Bratislava loaded area

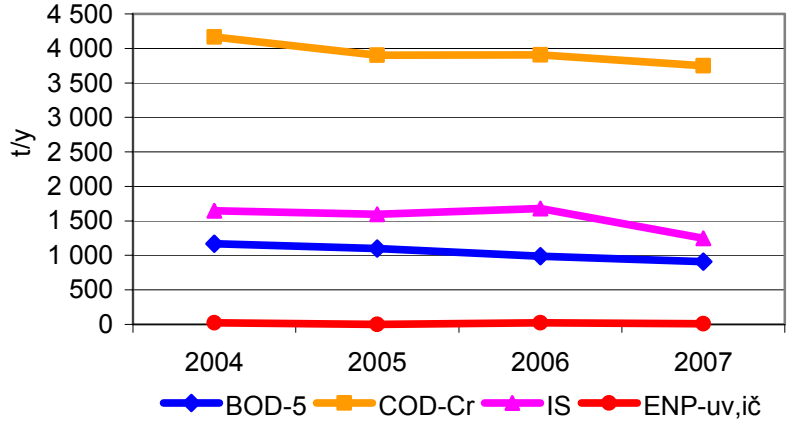
Source of contamination	BOD_5 ($t.y^{-1}$)				COD_{Cr} ($t.y^{-1}$)			
	2004	2005	2006	2007	2004	2005	2006	2007
Slovnaft, Inc.,-WWTP	77.34	70.34	77.15	56.97	395.04	484.80	522.63	418.11
Istrochem, Inc.,-WWTP	729.29	696.49	532.51	512.96	1 905.23	1 594.24	1 404.52	1 436.10
Slovnaft bl. 17-18 WWTP	125.79	123.82	133.23	108.59	516.58	573.82	597.73	613.18
WWTP Vrakuňa	176.04	149.68	171.65	174.79	1 010.29	893.21	1 005.07	987.02
WWTP Petržalka	60.71	58.16	72.27	54.95	337.86	353.39	373.92	295.81

Source: SHMI

Source of contamination	IS ($t.y^{-1}$)				$ENP_{UV,IC}$ ($t.y^{-1}$)			
	2004	2005	2006	2007	2004	2005	2006	2007
Slovnaft, Inc.,-WWTP	113.94	113.41	142.54	82.22	3.14	0	5.08	1.35
Istrochem, Inc.,-WWTP	57.71	47.89	59.25	102.51	1.29	0.66	0.75	0.99
Slovnaft bl. 17-18 WWTP	535.24	573.88	502.98	565.13	16.62	0	18.53	7.94
WWTP Vrakuňa	728.95	641.01	715.35	387.10	0	0	0	0
WWTP Petržalka	209.83	217.61	257.63	112.34	0	0	0	0

Source: SHMI

Trend in discharging of the pollution from significant resource into watercourses in Bratislava loaded area



Source: SHMI

♦ **Waste management**

Balance of waste generation

Waste production in Bratislava affected area

Sort of waste	Waste production (t.y^{-1})			
	2004	2005	2006	2007
Hazardous waste	74 195.38	51 555.00	80 223.48	99 538.62
Other waste	1 524 273.38	866 951.67	3 208 571.95	2 085 538.57
Municipal waste	184 937.70	200 998.52	194 973.39	208 315.43
Waste production in total	**1 783 406.46**	**1 119 505.19**	**3 483 769.82**	**2 393 392.62**

Source: SEA, SO SR

Waste handling

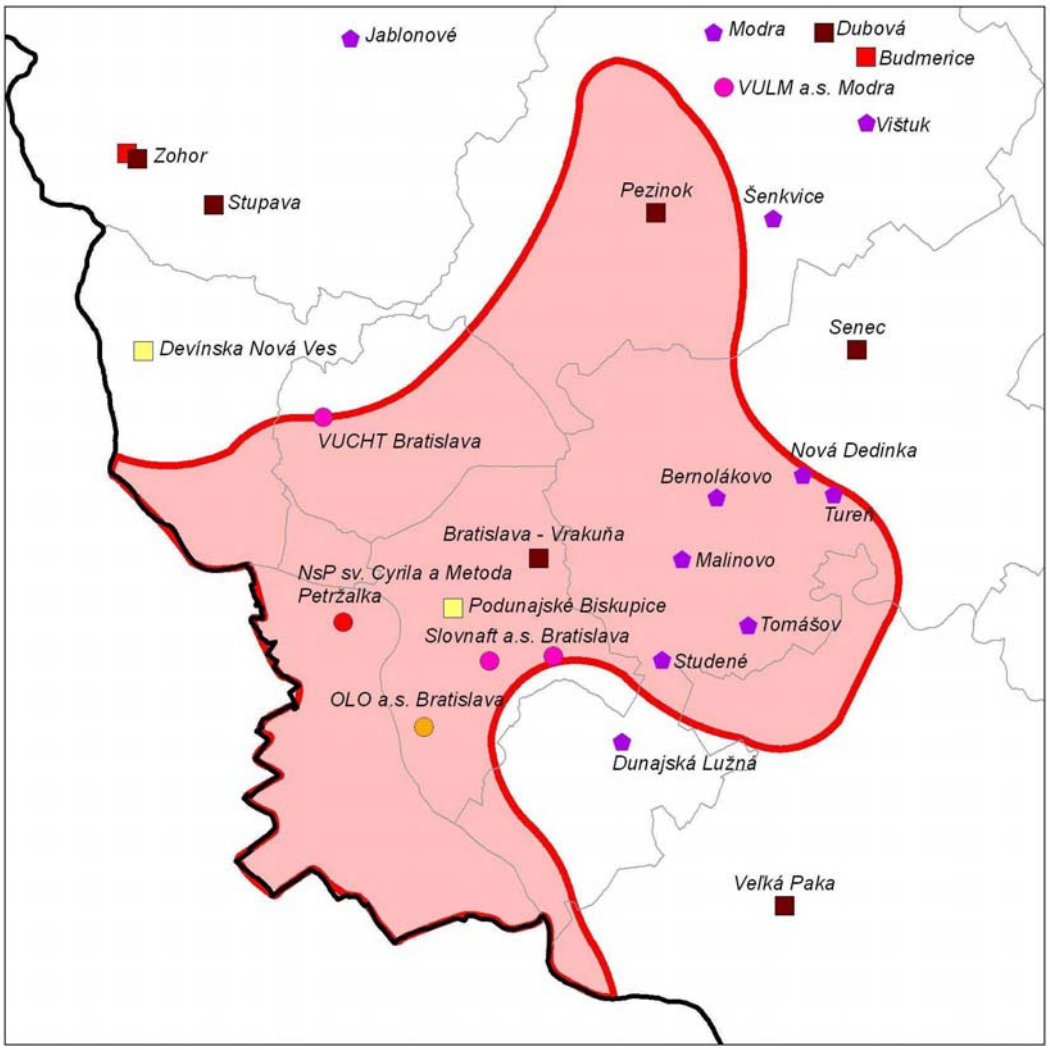
The most frequent waste handling activities within the monitored area include landfills and incineration. 44 – 84 % of annual production of the other waste and approximately 18 % of annual production of hazardous waste was disposed of at landfills, while 17 % of annual production of hazardous waste was disposed of through incineration. The year 2007 showed a more significant share of biologically eliminated hazardous waste. Annual production of hazardous waste reclamation rate was approximately 35 %, for other waste it was within the interval of 12 – 29 %.

Waste handling activities in the Bratislava loaded area

Waste handling	2004		2005		2006		2007	
	Waste amount (t.y^{-1})							
	Hazardous waste	Other waste	Hazardous waste	Other waste	Hazardous waste	Other waste	Hazardous waste	Other waste
Reclamation	27 923.00	240 324.00	18 740.33	250 572.75	25 062.52	378 739.26	33 835.51	494 121.71
Disposal through landfills	17 766.00	1 241 388.00	9 603.99	383 985.22	11 982.73	2 686 387.65	14 490.21	1 494 525.23
Disposal through incineration	18 089.00	1 702.00	11 566.88	3 048.05	13 958.96	19 338.64	3 955.61	2 104.14
Biological disposal	5 222.00	8 024.00	5 311.24	4 409.61	5 476.08	2 186.18	23 763.74	1 929.36
Other disposal	5 195.00	32 835.00	6 329.87	224 934.06	23 743.26	121 920.33	23 493.54	92 858.14

Source: SEA

Waste disposal facilities in Bratislava affected area in 2007



Waste disposal facilities

- Municipal waste incinerator
- Medical waste incinerator
- Industrial waste incinerator
- Hazardous waste landfill
- Non-hazardous waste landfill
- Inert waste landfill
- Landfill operated under special conditions

Source: SEA

The Lower Považie laded area

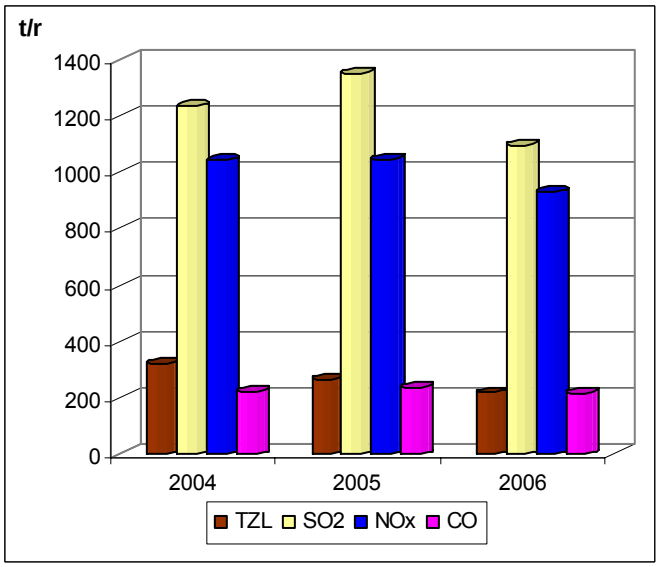
- **Air pollution**

Air quality has been affected mainly by industrial sources including chemical and food industries, production of glass fibre, agricultural production, and waste elimination. Other significant air pollution sources also include traffic, suspension and re-suspension of particles from insufficiently cleaned roads, construction sites, storing places of powdery material, and heating of houses with solid fuel. Emissions of all basic pollutants in 2006 showed a decreasing tendency.

Five major operators of air pollution sources in the Lower Považie loaded area

No.	Operator
1.	Duslo, Inc., Šaľa
2.	Slovak sugar, Inc., Premises Sereď
3.	Mach-Trade, Ltd., Sereď
4.	Zelex Slovakia, Ltd., Komárno
5.	QUEEN, Ltd., Neded

Emission volumes in the Lower Považie loaded area



t/r – tons/year
TZL – PM

Source: SHMI

There is no air pollution monitoring station within the area. Therefore, air quality of this loaded area cannot be assessed.

- **Surface water contamination**

The area includes the lower portion of the Váh River that receives run-off and industrial waste water. Váh in this area is periodically affected by contaminated streams of Trnávka and Dolný Dudváh, with 32-58 % of the indicators not complying with the SR GO 296/2005 Coll. Trnávka and Dolný

Dudváh belong to the most heavily contaminated streams in the SR. The ENP_{UV} indicator in the Váh river shows the most adverse situation.

The area also includes the lower Nitra River region. This part of the river together with its feeding streams has been impacted by the food industry and discharged run-off waste water from residential zones. The water course is heavily contaminated. Microbiological indicators show worse situation with the presence of the coliform bacteria, thermo-tolerant coliform bacteria and fecal streptococci that do not comply with SR GO 296/2005 Coll. Limit values also exceed the contents of Al and Hg. This situation in water quality is impacted also by contamination coming from the upper and middle parts of the stream.

Surface water quality in the Lower Považie laded area

Water course	Sampling site	Number of assessed or detected indicators	Indicators not complying with SR GO No. 296/2005 Coll. of total number of assessed indicators	
			Number	%
Váh	Nad Sereďou	29	3	11
	Vlčany	39	2	5
	Kolárovo	15	1	7
Trnávka	Modranka	22	7	32
Dolný Dudváh	Sládkovičovo	24	14	58
Nitra	Komoča	48	12	25

Source: SHMI

- **Ground water contamination**

Groundwater quality for the affected area has been monitored in 3 groundwater formations – in quaternary sediments and in 1 formation of groundwater inside pre-quaternary rocks.

Limit values in comparison with requirements of the SR Government Ordinance 354/2006 Coll. In 2007 were exceeded in all groundwater formations extending into the affected area. Most frequently exceeded indicators include total Fe, Mn, nitrates, sulphates, chlorides, ammonium ions, and chemical oxygen demand for Mn (COD_{Mn}). Limit values for heavy metals were exceeded for the categories of Al and As. Monitoring for organic substances shows exceeded values for total organic carbon, UI insoluble substances (IS_{UI}), benzene, chlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,1,2-tri-chloroethene, and poly-aromatic hydrocarbons. Exceeded were also the limit values for pesticides.

Groundwater is heavily attacked by agricultural and industrial activities.

- **Sources of water contamination**

Major water contamination sources for both the loaded area, as well as the whole SR territory, include WWTP Duslo, Inc. Šaľa, WWTP Trnava, WWTP Nové Zámky, and WWTP Galanta. Other than the mentioned soruces, sewerages of the cities of Sereď, Šaľa, Sládkovičovo, and the sugar refinery in Sereď, significantly impact water contamination.

Major sources of water contamination and contamination discharged to surface water within the Lower Považie loaded area

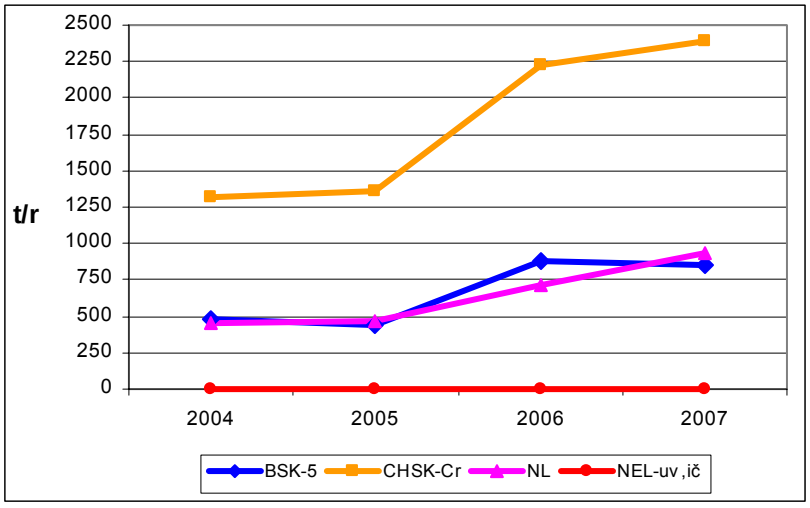
Source of contamination	BOD_5 ($t.y^{-1}$)				COD_{Cr} ($t.y^{-1}$)			
	2004	2005	2006	2007	2004	2005	2006	2007
Duslo, Inc., Šaľa – WWTP	181.90	118.30	241.16	69.62	592.48	497.87	686.92	605.47
WWTP Trnava-Zeleneč	111.63	139.20	173.52	396.54	343.19	456.15	542.98	976.15
WWTP Nové Zámky	66.72	75.62	332.54	322.11	155.25	176.18	689.42	635.47
WWTP Galanta	108.31	96.03	124.84	56.64	225.22	219.91	301.53	166.02
Slovak sugar, Inc. Sereď	12.44	11.51	2.83	2.14	4.65	3.86	1.07	9.01

Source: SHMI

Source of contamination	IS ($t.y^{-1}$)				$ENP_{UV,IC}$ ($t.y^{-1}$)			
	2004	2005	2006	2007	2004	2005	2006	2007
Duslo,Inc.,Šaľa – WWTP	157.49	121.04	114.76	206.19	2.68	1.44	1.96	1.57
WWTP Trnava-Zeleneč	108.62	144.31	160.65	357.68	0	0	0	0
WWTP Nové Zámky	82.64	95.89	380.42	327.41	0	0	0	0
WWTP Galanta	53.61	50.01	60.65	42.72	0	0	0	0
Slovak sugar, Inc. Sereď	56.87	55.63	3.44	2.45	0	0	0	0

Source: SHMI

Trend in discharging of the ollution from significant resource into watercourses in Lower Považie loaded area



BSK – BOD, CHSK – COD, NL – IL, NEL - ENP Source: SHMI

♦ **Waste management**

Balance of waste generation

Based on the RISO data, total production of waste in the area during 2004-2007 showed a rising trend, due to the production of other waste categories that have has a decisive effect on total production of waste within the area. Production of municipal waste did not show major changes.

Waste production in the Lower Považie loaded area

Sort of waste	Waste production (t.y^{-1})			
	2004	2005	2006	2007
Hazardous waste	15 543.23	14 844.98	43 791.96	7 501.49
Other waste	79 003.43	202 317.31	237 375.97	317 931.89
Municipal waste	84 220.43	75 462.03	80 448.77	86 401.29
Waste production in total	**178 767.36**	**292 624.32**	**361 616.70**	**411 834.67**

Source: SEA, SO SR

Waste handling

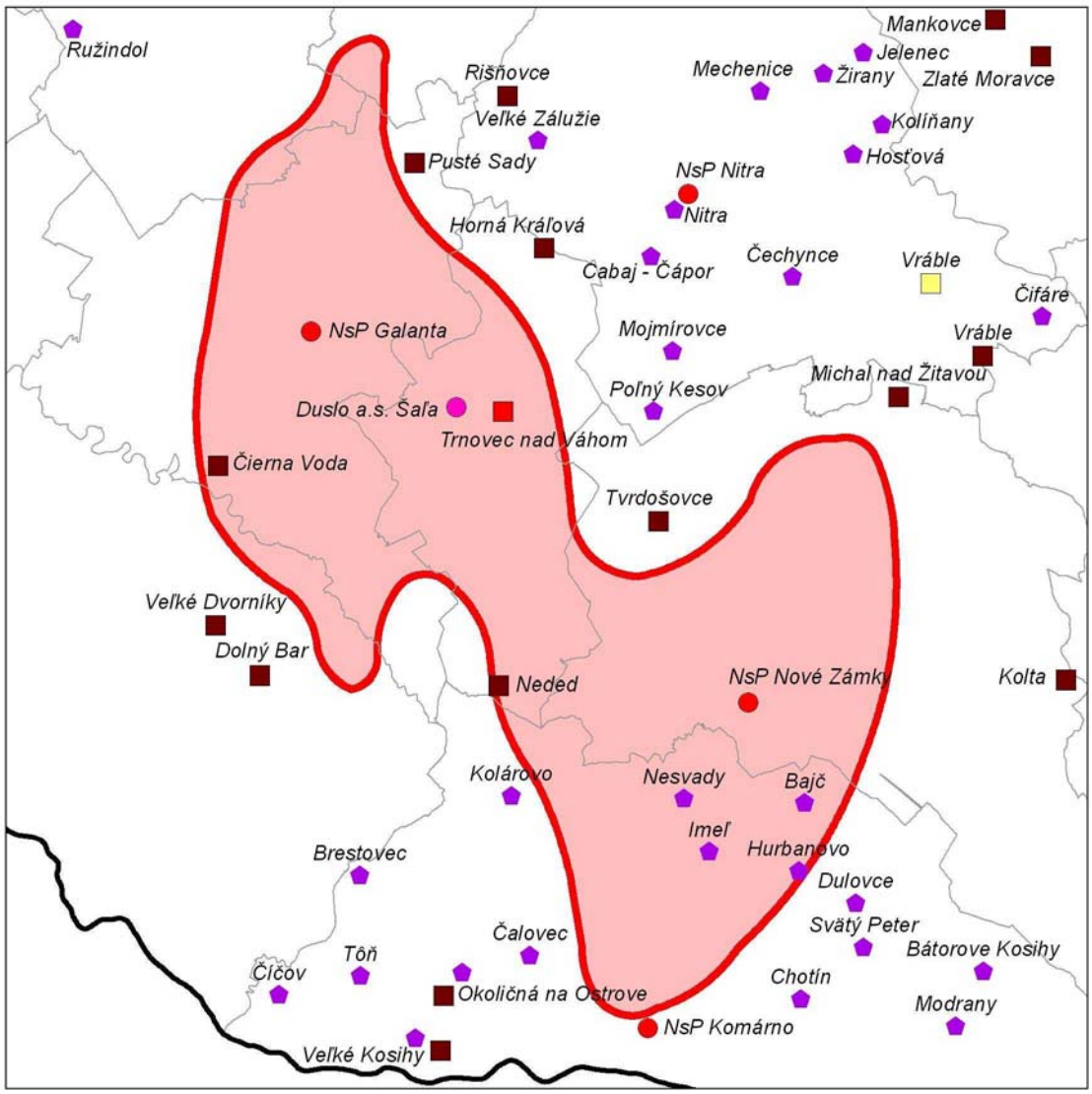
Waste disposal on landfills was the most frequent hazardous waste disposal approach in the area, showing the average of 43 %. Waste elimination through incineration was prevalent in 2004-2006, with the average of 47 %; however, in 2007 it dropped substantially to 7 %. Since 2006, another form of hazardous waste elimination grew to the average of 27 %. In 2006, hazardous waste reclamation grew from 5 % to 31 %, which persisted also in the following year at the level of 21 %. Total assessment of other waste handling activities shows the dominance of other waste handling activities within the interval of 56-75 %, with waste disposal through landfills showed significantly decreasing trend. The area shows an increase in other waste reclamation activities, staying at 26 % in 2006.

Waste handling activities in the Lower Považie loaded area

Waste handling	2004		2005		2006		2007	
	Waste handling (t.y^{-1})							
	Hazardous waste	Other waste	Hazardous waste	Other waste	Hazardous waste	Other waste	Hazardous waste	Other waste
Reclamation	900.00	16 472.00	812.96	15 472.91	13 499.59	69 296.53	1 596.94	70 383.37
Disposal through landfills	5 853.00	15 575.00	3 881.08	38 554.12	11 748.50	33 587.25	3 306.88	8 042.41
Disposal through incineration	7 440.00	307.00	7 465.93	808.82	17 033.38	263.72	538.75	505.31
Biological disposal	223.00	23.00	45.89	173.35	275.45	384.68	165.23	147.14
Other disposal	1 127.00	46 626.00	2 638.46	147 307.75	1 235.14	133 843.79	1 893.70	238 853.64

Source: SEA

Waste disposal facilities in the Lower Považie loaded area 2007



Waste disposal facilities

- Municipal waste incinerator
- Medical waste incinerator
- Industrial waste incinerator
- Hazardous waste landfill
- Non-hazardous waste landfill
- Inert waste landfill
- Landfill operated under special conditions

Source: SEA

The Ponitrie loaded area

- **Air pollution**

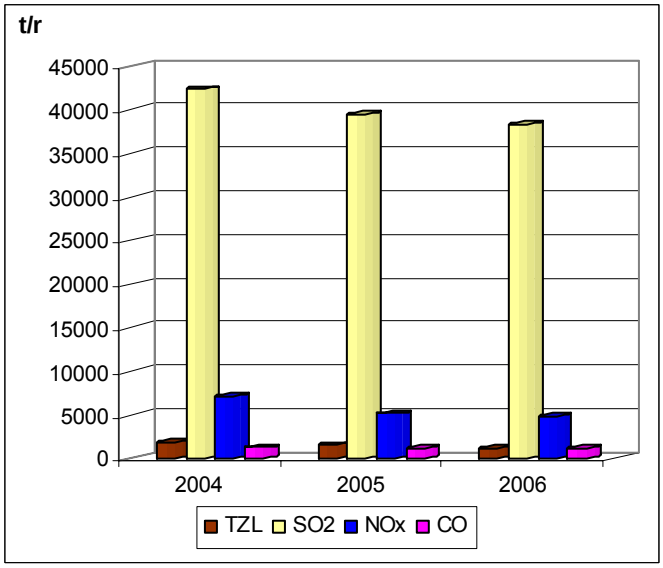
The affected area shows large industrial sources that are major representatives of fuel-energy, mining, and chemical industries. Other sources that contribute to air pollution include mostly traffic, suspension and re-suspension of particles from insufficiently cleaned roads, construction sites and other municipal areas, household heating places for solid fuel, coal stores in the district of Prievidza, and energy sector tailing dumps.

Five major operators of air pollution sources in the Ponitrie loaded area

No.	Operator
1.	Novácke chemické závody, Inc. , Nováky
2.	SE, Inc., Bratislava, - ENO Zemianske Kostoľany
3.	KVARTET, Inc., Partizánske
4.	TSM, Ltd., Partizánske
5.	IDEA NOVA, Ltd., Nitra

In 2007, 24-hour limit value for public health protection for PM_{10} was exceeded at all monitoring stations except the station of Nitra – J. Kráľa Annual limit value was exceeded only at Prievidza-Malonecpalská monitoring station. NO_2 concentration in 2007 was measured only at one monitoring station.

Emission volumes in the Ponitrie loaded area



t/r – tons/year
TZL – PM

Source: SHMI

Annual lead concentration in the area shows a decreasing tendency every year. In 2007, this was measured only at one monitoring station. Limit value for benzene was not exceeded.

In 2007, there was only a single detected case of exceeded information threshold (IT) in ground ozone concentration with the duration of one hour (for the "caution" signal). Alarm threshold (AT) in ground ozone concentration lasting one hour (for the „warning" signal) at monitoring station was not exceeded.

There was defined an air quality management zone in the area for the territories of Nitra and the district of Prievidza, to monitor the PM_{10}, and SO_2 pollutants.

- **Surface water contamination**

The area includes the upper and central regions of the Nitra River. Surface water shows relatively heavy contamination, due to anthropogenic activities. The upper region of the river shows water quality that has for a long time been impacted by water from the mining industry. Also, industrial activities negatively impact water quality – production of plastic and heavy chemistry, electric power plants, heating stations, leather-processing industry, and food-processing industry in the river's central region. Microbiological indicators show the worse situation with the presence of the coliform bacteria, thermo-tolerant coliform bacteria and fecal streptococci that do not comply with SR GO 296/2005 Coll. Limit values significantly exceed the contents of Hg, IS_{UV}, and organic hydrocarbons.

Surface water quality in the Ponitrie loaded area

Water course	Sampling site	Number of assessed or detected indicators	Indicators not complying with SR GO No. 296/2005 Coll. of total number of assessed indicators	
			Number	%
Nitra	Nedožery	26	6	23
	Chalmová	48	18	38
	Nitrianska Streda	44	14	32
Nitrica	Partizánske	32	4	13

Source: SHMI

- **Ground water contamination**

Ground water quality for the loaded area has been monitored in 1 groundwater formation - in quaternary sediments and in 5 formations of groundwater inside pre-quaternary rocks.

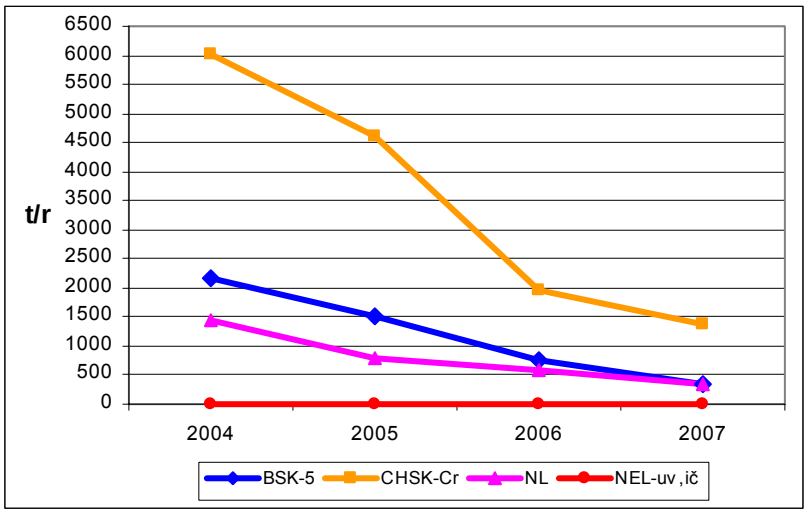
Limit values in comparison with requirements of the SR Government Ordinance 354/2006 Coll. in 2007 were exceeded in all groundwater formations extending into the affected area. The most frequently exceeded indicators include total Fe, Mn, and nitrates. Limit values for heavy metals were exceeded for the categories of Al and As. Organic substances that showed exceeded values include organic carbon, and poly-aromatic hydrocarbons. Also the limit values for pesticides were exceeded in the formation of groundwater inside quaternary sediments.

Ground water is negatively affected by high concentration of industrial and agricultural activities, which is reflected in its chemical composition.

♦ **Sources of water contamination**

Major water contamination sources for both the loaded area, as well as the whole SR territory, include WWTP NCHZ Nováky, WWTP Topoľčany, and WWTP Nitra. Besides these sources, public sewerage of the cities of Prievidza and Partizánske, as well as other sources above the loaded area, contribute to water contamination.

Trend in discharging of the polution from significant resource into watercourses in Ponitrie loaded area



BSK – BOD, CHSK – COD, NL – IL, NEL - ENP Source: SHMI

♦ **Waste management**

Balance of waste generation

Based on the RISO data, total production of waste in the area during 2004-2007 showed a rising trend. There was a gradual increase in the production of municipal waste and other waste, having a major impact on total waste production within the area. Production of hazardous waste showed a significant decline.

Waste production in the Ponitrie loaded area

Sort of waste	Waste production ($t.y^{-1}$)			
	2004	2005	2006	2007
Hazardous waste	22 776.19	35 124.34	11 005.85	9 140.79
Other waste	1 041 523.89	1 064 061.20	1 160 447.21	1 136 060.29
Municipal waste	82 889.60	88 731.29	100 132.50	98 676.91
Waste production in total	**1 147 189.66**	**1 187 916.83**	**1 271 585.59**	**1 243 877.99**

Source: SEA, SO SR

Waste handling

Landfills represent the most frequent way of waste disposal with approximately 67 %, while 29 % is disposed of through reclamation. Hazardous waste handling for the monitored period varied. While in 2004 hazardous waste reclamation accounted for 59 %, in the following time period it dropped to the average 19 %. In 2005, hazardous waste disposal through incineration was dominant; accounting for 49 %, while in 2006

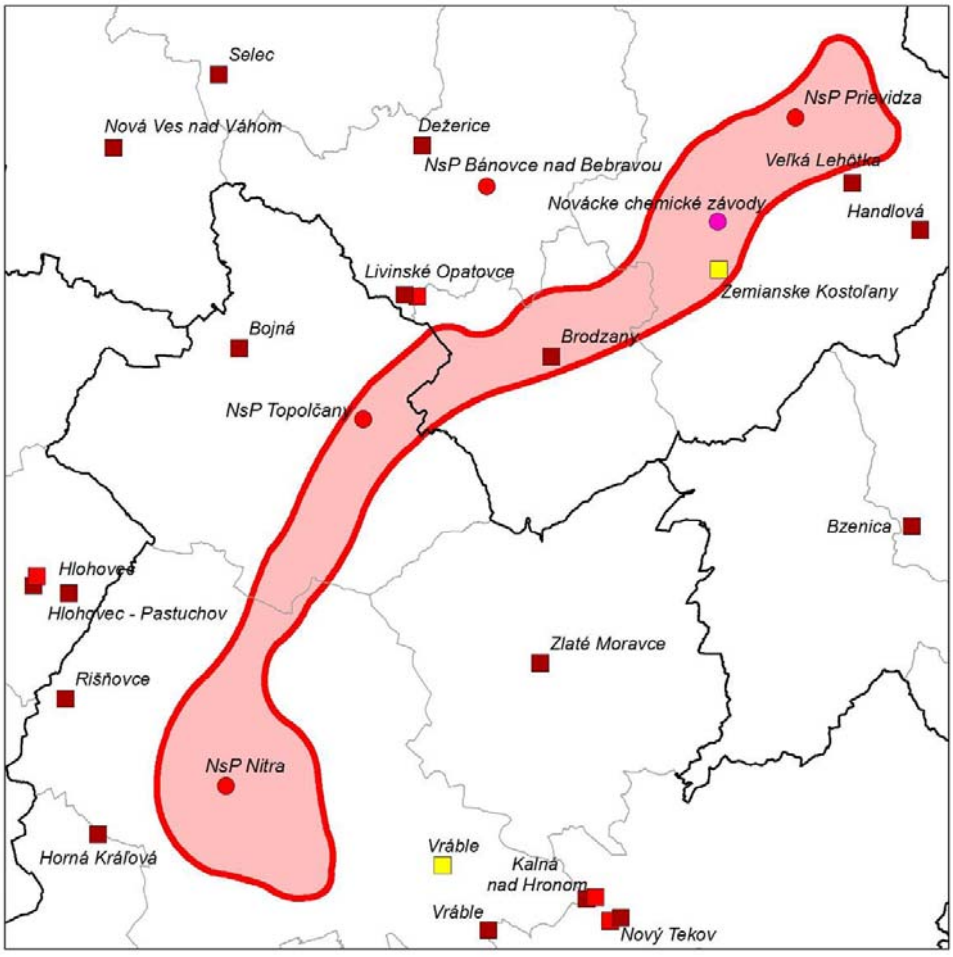
and 2007 other form of disposal was prevalent, accounting for the average 53 % of the annual production. On average, 8 % of annual hazardous waste production was disposed of through landfills.

Waste handling activities in the Ponitrie loaded area

Waste handling	2004		2005		2006		2007	
	Waste amount ($t.y^{-1}$)							
	Hazardous waste	Other waste	Hazardous waste	Other waste	Hazardous waste	Other waste	Hazardous waste	Other waste
Reclamation	13 372.00	291 586.00	6 168.83	276 965.53	2 095.41	351 236.05	1 809.82	379 533.73
Disposal through landfills	1 178.00	707 923.00	2 994.53	742 516.80	1 083.81	777 287.54	839.12	736 332.58
Disposal through incineration	2 295.00	39.00	17 575.94	77.87	1 374.99	9 857.72	948.72	47.67
Biological disposal	2 509.00	1 998.00	642.37	2 987.03	784.02	8 319.36	582.42	9 964.60
Other disposal	3 422.00	39 978.00	7 741.40	41 513.27	5 667.74	13 746.68	4 960.70	10 181.73

Source: SEA

Waste disposal facilities in the Ponitrie loaded area in 2007



Waste disposal facilities

- Municipal waste incinerator
- Medical waste incinerator
- Industrial waste incinerator
- Hazardous waste landfill
- Non-hazardous waste landfill
- Inert waste landfill
- Landfill operated under special conditions

Source: SHMI

The Pohronie loaded area

- **Air pollution**

Industrial sources including wood processing industry, heating houses, and aluminium processing industry that are concentrated in industrial municipal zones have a significant share on air pollution. Other local pollution sources include mainly transportation, suspension and re-suspension of particles from insufficiently clean roads, construction sites, and landfills of powder material, heating of houses with solid fuels, and agriculture that directly impact pollution level.

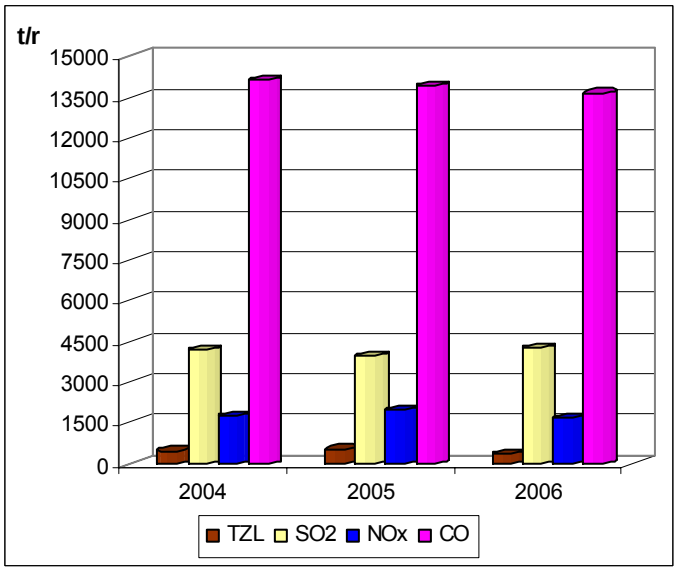
Five major operators of air pollution sources in the Pohronie loaded area

No.	Operator
1.	SLOVALCO, Inc., Žiar nad Hronom
2.	Zvolenská teplárenská, Inc., Zvolen
3.	ZSNP, Inc., Žiar nad Hronom
4.	Bučina, Inc., Zvolen
5.	BUČINA DDD, Ltd., Zvolen

Volumes of basic pollutant emissions in 2006 showed a decreasing tendency, with the exception of SO_2 that slightly increased.

Unlike 2006, number of exceeded measurements for 24-hour public health limit value decreased at the monitoring station of Banská Bystrica – Nám. slobody. Other pollutants did not exceed limit or target values. In 2007, NO_2 concentrations were measured only at one monitoring station.

Emission volumes in the Pohronie loaded area



t/r – tons/year
TZL – PM

Source: SHMI

In 2007, there was no single detected case of exceeded information threshold in ground ozone concentration with the duration of one hour (for the "caution" signal). Alarm threshold in ground ozone concentration lasting one hour (for the „warning" signal) at monitoring station was not detected.

- **Surface water contamination**

Hron is the major water course in the area. Water quality within the area is also influenced by received contamination from the upper region of th Hron river, which is the recipient of waste water from machinery, wood-processing, and food-processing plants, as well as from oil refineries and the production of heating oils.

Discharged waste water directly affects the Hron river in the Sliač area, but part of the waste water enters Hron through its tributaries of Slatina and Zolná. Contamination by waste water from wood-processing and metal – processing industries is present in the surroundings of Žiar nad Hronom and Žarnovica. Microbiological indicators show the worse situation with the presence of the coliform bacteria, thermo-tolerant coliform bacteria and fecal streptococci that do not comply with SR GO 296/2005 Coll. Limit values significantly exceed also the contents of IS_{UV}. Limit-exceeding values were detected also for persistent organic pollutants - fluoranthene, Water quality has been adversely affected also by discharged municipal waste water within and outside municipal zones.

Surface water quality in the Pohronie loaded area

Water course	Sampling site	Number of assessed or detected indicators	Indicators not complying with SR GO No. 296/2005 Coll. of total number of assessed indicators	
			Number	%
Hron	Banská Bystrica	15	3	20
	Budča	31	7	23
	Žiar nad Hronom	20	5	25
	Žarnovica	20	3	15
Zolná	Ústie	23	5	22
Slatina	Ústie	21	3	14

Source: SHMI

- **Ground water contamination**

Groundwater quality for the loaded area has been monitored in 1 groundwater formation - in quaternary sediments and in 4 formations of groundwater inside pre-quaternary rocks.

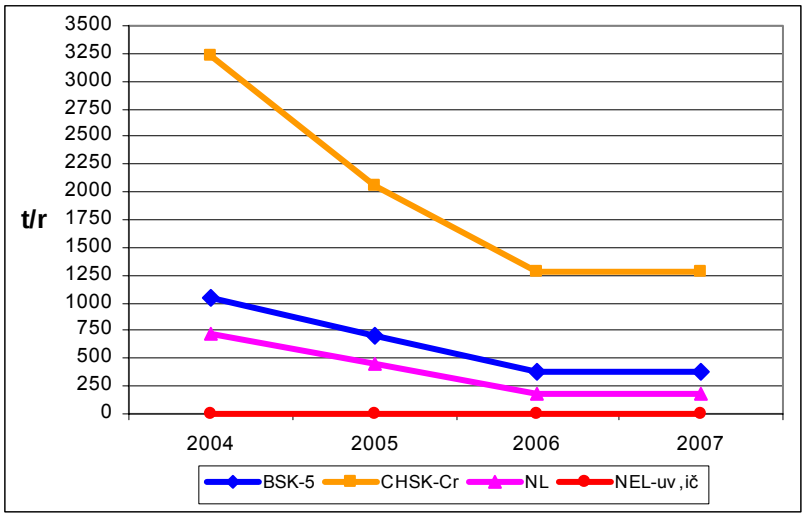
Limit values in comparison with requirements of the SR Government Ordinance 354/2006 Coll. in 2007 were exceeded in both, 1 groundwater formation inside quaternary sediments and in 3 groundwater formations inside pre-quaternary rocks reaching into the affected area. Most frequently exceeded indicators include total Fe, Mn, sulphates, nitrates, and ammonium ions. Limit values for heavy metals were exceeded for Al, As, Hg, Ni, and Sb. Organic substances that showed exceeded values include organic carbon, and poly-aromatic hydrocarbons. Also the limit values for pesticides were exceeded in the formation of groundwater inside quaternary sediments. especially in terms of trace elements.

- **Sources of water contamination**

Major sources of pollution for the local as well as the whole Slovak territory include WWTP SHP Harmanec, and WWTP Banská Bystrica. Other sources of water contamination include public sewerages and industrial facilities in Zvolen, Slovenská Ľupča, Žiar nad Hronom, and Žarnovica. Over the recent years, discharged contamination in the area was reduced, due to reduced discharged contamination from

the company Biotika Inc., Slovenská Ľupča. In this plant were carried out WWTP repairs. Reconstruction and extension of WWTP Zvolen and WWTP Banská Bystrica carried out last year were positively reflected in decreased volumes of discharged contamination from these sources.

Trend in discharging of the pollution from significant resource into watrercourses in the Pohronie loaded area



BSK – BOD, CHSK – COD, NL – IL, NEL - ENP Source: SHMI

- **Waste management**

Balance of waste generation

Total waste generation in the area, according to RISO data, was in 2004-2007 relatively stabilised, with the exception of 2005 when it showed significant increase due to increased production of other waste that, except for the mentioned year, show permanently dominant share on total waste generation in the area. In 2005, generation of hazardous and municipal waste also increased.

Waste production in the Pohronie loaded area

Sort of waste	Waste Production (t.y^{-1})			
	2004	2005	2006	2007
Hazardous waste	13 996.46	21 758.15	23 138.28	15 745.80
Other waste	236 245.91	695 661.34	278 010.90	230 041.45
Municipal waste	50 331.90	55 030.91	61 178.36	61 187.22
Waste production in total	**300 574.30**	**772 450.40**	**362 327.56**	**306 974.47**

Source: SEA, SO SR

Balance of waste generation

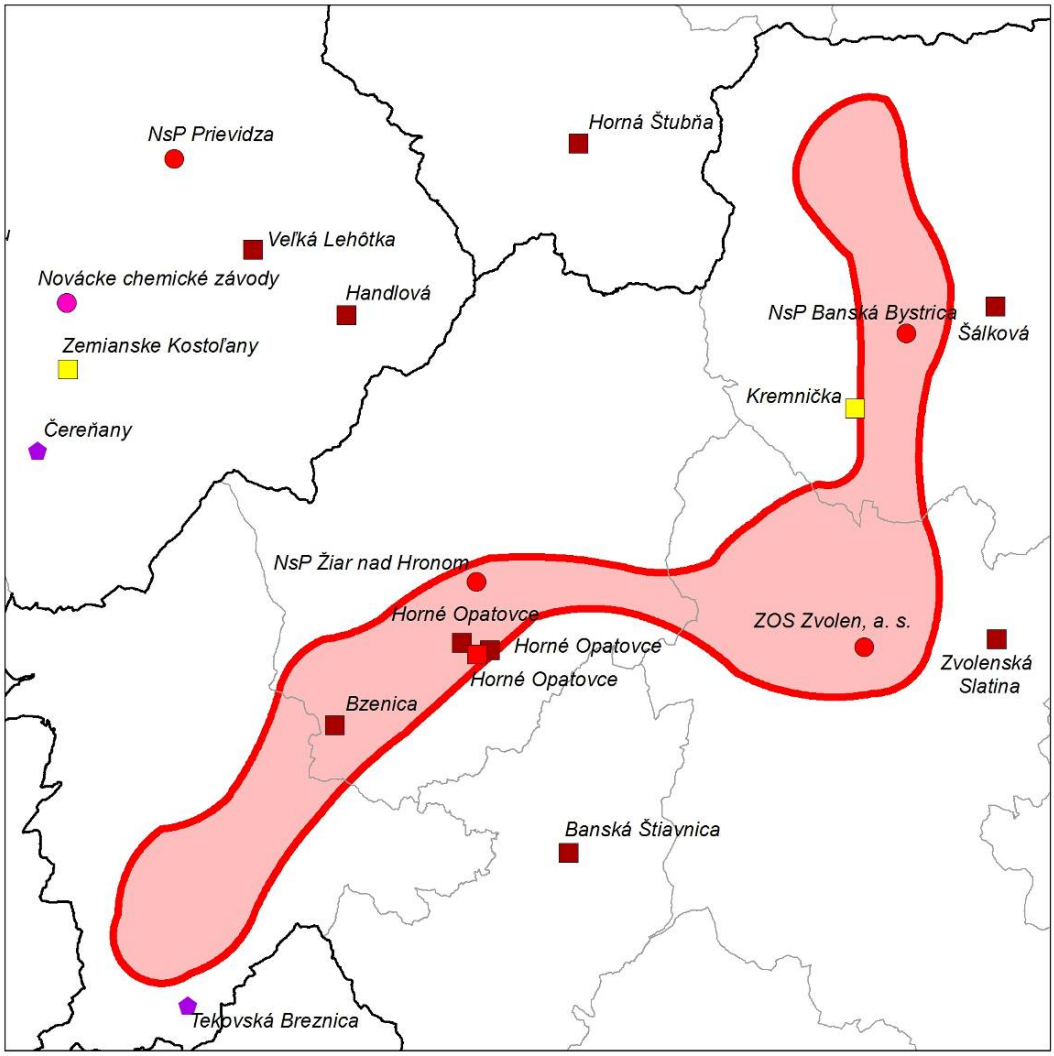
Most frequent hazardous waste handling approach in the area includes elimination by form, with the average 38 % of annual production. Waste elimination on landfills in 2004-2006 was 21 % on average, showing an increase to 48 % in 2007. On average, 24 % of hazardous waste was reclaimed. Other waste handling for the monitored period varied. Average 54 % of annual production was reclaimed (as much as 87 % in 2005), 27 % was disposed of on landfills, and 19 % of annual other waste production was eliminated through other forms.

Waste handling activities in the Pohronie loaded area

Waste handling	2004		2005		2006		2007	
	Waste amount (t.y^{-1})							
	Hazardous waste	Other waste	Hazardous waste	Other waste	Hazardous waste	Other waste	Hazardous waste	Other waste
Reclamation	4 124.00	79 440.00	4 827.80	606 614.67	5 945.46	114 057.88	2 863.19	123 218,90
Disposal through landfills	2 362.00	40 809.00	4 631.36	56 626.94	6 582.60	114 175.71	7 481.10	91 573.59
Disposal through incineration	189.00	5 900.00	262.40	462.73	350.36	1 900.12	207.23	1 511.25
Biological disposal	1 943.00	125.00	1 624.95	38.77	3 003.68	261.15	428.56	455.81
Other disposal	5 378.00	109 972.00	10 410.24	31 917.35	7 256.24	47 616.09	4 765.71	13 281.91

Source: SEA

Waste disposal facilities in the Pohronie loaded area in 2007



Waste disposal facilities

- Municipal waste incinerator
- Medical waste incinerator
- Industrial waste incinerator
- Hazardous waste landfill
- Non-hazardous waste landfill
- Inert waste landfill
- Landfill operated under special conditions

Source: SEA

The Jelšava-Lubeník loaded area

- **Air pollution**

Magnesite plant that extracts and processes magnesite significantly contributes to air pollution. Other local pollution sources originate mainly from traffic, insufficiently cleaned roads, construction sites, stores of powdery materials, and heating of houses with solid fuels.

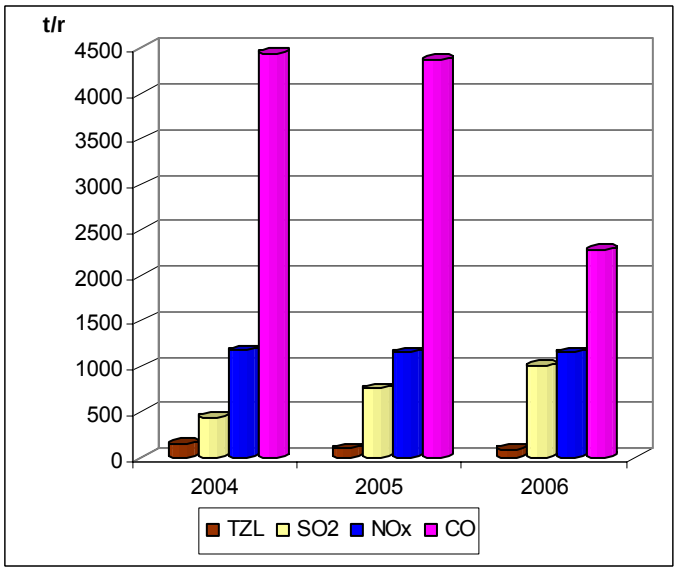
Five major operators of air pollution sources in the Jelšava-Lubenik loaded area

No.	Operator
1.	Slovak Magnesite Plant, Inc., Jelšava
2.	Slovmag Lubeník, Inc., Revúca
3.	Slovak bus traffic, Inc., Revúca
4.	DREVOEXPORT, Ltd., Revúca
5.	RETES, Ltd., Revúca

Emission volumes in this area decrease every year. CO pollutant showed greatest reduction by almost 2000 t/y.

In 2007, there were no NO_2 pollution values detected at the monitoring station. In case of PM_{10}, the 24-hour public health limit value was exceeded 78 times, with no exceeded annual limit value.

Emission volumes in the Jelšava-Lubeník loaded area



t/r – tons/year
TZL – PM

Source: SHMI

In 2007, lead concentrations were not monitored at the monitoring station. Most recent data comes from 2006.

Number of exceeded limits for one-hour ground ozone information threshold (IT) (for the “caution” signal) in 2007, shows rising tendency, compared to 2006. Alarm threshold (AT) in ground ozone concentration lasting one hour (for the „warning" signal) at monitoring station was not exceeded.

Target value of 120 $\mu g.m^{-3}$ for allowed number of exceeded values for eight-hour ground ozone concentration was exceeded.

There was defined an air quality management zone for the territories of Jelšava, Lubeník, Chyžné, Magnezitovce, Mokrá Lúka, and Revúcka Lehota to monitor the PM_{10} pollutant.

- **Surface water contamination**

Upper part of the Muráň water course crosses the area. Out of 18 assessed or measured indicators, only nitrite nitrogen does not comply with the provisions of SR GO 296/2005 Coll.

Surface water quality in the Jelšava-Lubeník loaded area

Water course	Sampling site	Number of assessed or detected indicators	Indicators not complying with SR GO No. 296/2005 Coll. of total number of assessed indicators	
			Number	%
Muráň	Jelšavská Teplica	18	1	6

Source: SHMI

- **Ground water contamination**

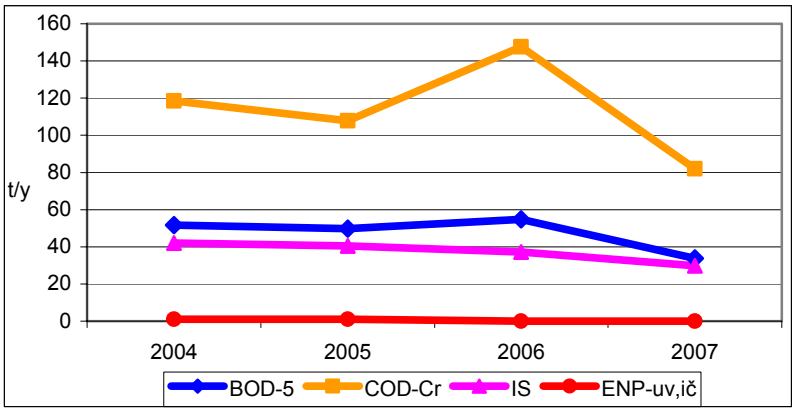
Ground water quality in the affected area is monitored in 2 ground water formations inside pre-quaternary rocks.

Limit values in comparison with requirements of the SR Government Ordinance 354/2006 Coll. in 2007 were exceeded in both groundwater formations inside pre-quaternary rocks reaching into the affected area. The most frequently exceeded indicators include total Fe, and Mn. Limit values for heavy metals were exceeded for the categories of Al, As, and Sb. Organic substances that showed exceeded values include poly-aromatic hydrocarbons.

- **Sources of water contamination**

In terms of volumes of discharged contamination in the SR, there is one major water contamination source – a WWTP in Revúca. Discharged contamination from industrial premises and WWTP in Lubeník and Jelšava is the biggest contributor affecting water contamination.

Trend in discharging of the pollution from significant resource into watercourses in the Jelšava-Lubeník loaded area



Source: SHMI

♦ **Waste management**

Balance of waste generation

Total waste generation in the area, by the RISO data, was on the rise in 2004-2007. This was caused by an increased generation of other waste types. Trend in the production of hazardous waste showed fluctuating characteristics. Municipal and other waste had a decisive impact on total production of waste in the area.

Waste production in the Jelšava-Lubeník loaded area

Sort of waste	Waste Production (t.y^{-1})			
	2004	2005	2006	2007
Hazardous waste	68.43	818.82	80.55	166.96
Other waste	2 309.71	4 043.09	3 310.60	6 469.89
Municipal waste	4 385.20	5 035.07	5 804.90	5 009.86
Waste production total	**6 763.34**	**9 896.98**	**9 196.05**	**11 646.71**

Source: SEA, SO SR

Waste handling

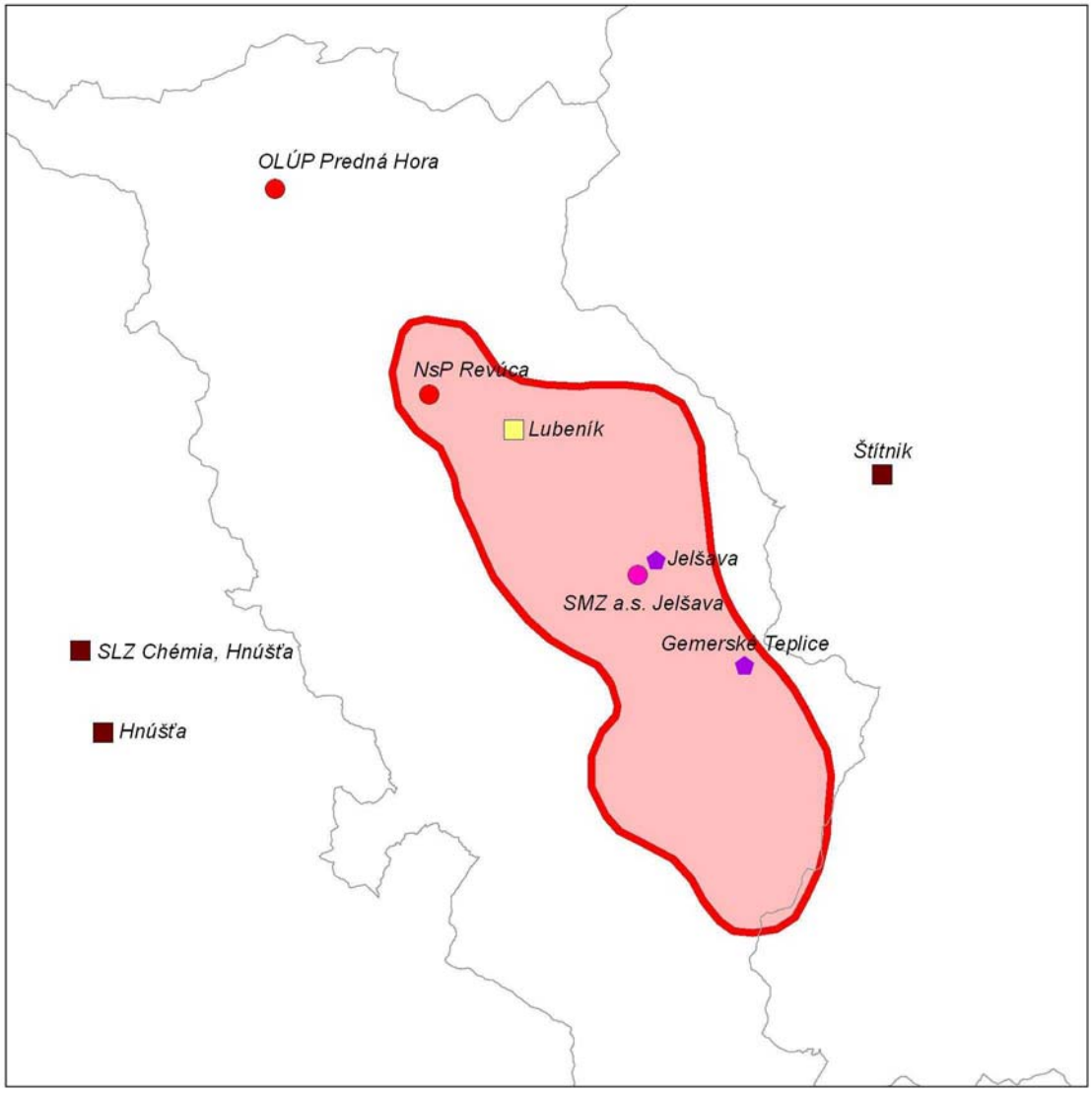
Individual hazardous waste handling approaches in the area show varying characteristics. Hazardous waste generation in 2004 and 2006 was disposed of through reclamation (the average of 61 %), in 2005 through biological elimination (91 %), and in 2007 through landfills (69 %). On average, 55 % of other waste types for the monitored period were reclaimed, with the greatest degree of reclamation of 74 % in 2005. Elimination of other waste types included other elimination approaches, biological elimination and landfills. Waste disposal on landfills represented 64 % in 2006.

Waste handling activities in the Jelšava-Lubeník loaded area

Waste handling	2004		2005		2006		2007	
	Waste amount (t.y^{-1})							
	Hazardous waste	Other waste	Hazardous waste	Other waste	Hazardous waste	Other waste	Hazardous waste	Other waste
Reclamation	48.00	1 114.00	51.07	2 966.66	41.87	1 123.97	26.36	4 092.54
Disposal through landfills	4.00	88.00	0.20	932.71	11.66	2 123.78	115.94	802.67
Disposal through incineration	7.00	12.00	22.93	9.96	15.88	6.98	10.70	33.93
Biological disposal	0.00	485.00	743.49	0.00	7.88	0.00	4.20	1 387.00
Other disposal	0.00	485.00	743.49	0.00	7.88	0.00	4.20	1 387.00

Source: SEA

Waste disposal facilities in the Jelšava-Lubeník loaded area in 2007



Waste disposal facilities

- Municipal waste incinerator
- Medical waste incinerator
- Industrial waste incinerator
- Hazardous waste landfill
- Non-hazardous waste landfill
- Inert waste landfill
- Landfill operated under special conditions

Source: SEA

The Rudniansko-gelnická loaded area

- **Air pollution**

Industrial sources, especially smelting industries and mineral exploitation substantially contribute to air pollution. Other sources include dumps of debris from smelting industry, steel production, ore deposits with no cover, coal deposits, re-suspension of particles from roads, and local heating systems using solid fuels.

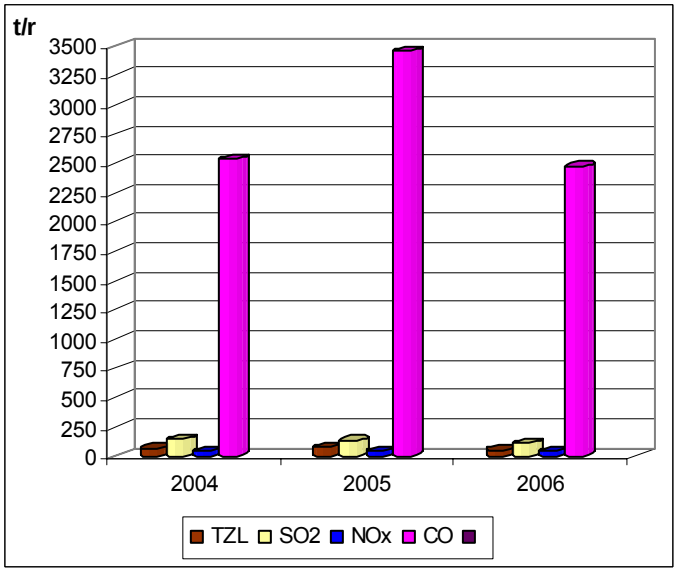
Five major operators of air pollution sources in the Rudniansko-gelnická loaded area

No	Operator
1.	Calmit, Ltd., Bratislava, operation Margecany
2.	KOVOHUTY, Inc., Krompachy
3.	Prakovská steel corp., Ltd., Prakovce
4.	Zlieváreň SEZ, Inc., Krompachy
5.	POLYTOP SNV, Ltd., Spišská Nová Ves

We can see that in 2007 the volumes of emissions, especially CO emissions, decreased. CO emissions showed a 1 000 t/y decrease.

Compared to 2006, annual NO_2 concentration in 2007 increased. However, the annual limit value tolerance was not exceeded, neither the one-hour public health limit value. The station did not show exceeded 24-hour limit, nor the annual public health limit for the PM_{10} pollutant.

Emission volumes in the Rudniansko–gelnická loaded area



t/r – tons/year
TZL – PM

Source: SHMI

Lead volumes in 2007 decreased significantly, compared to 2006. Benzene limit value was not exceeded.

Number of exceeded limits for one-hour ground ozone information threshold (IT) (for the "caution" signal) in 2007, shows slightly rising tendency, compared to 2006. Alarm threshold (AT) in ground ozone concentration lasting one hour (for the „warning" signal) at monitoring station was not exceeded.

Target value of 120 μg.m^{-3} for allowed number of exceeded values for eight-hour ground ozone concentration was exceeded.

There was defined an air quality management zone for the territory of Krompachy to monitor the PM_{10} pollutant.

- **Water contamination**

Surface water contamination

Hornád river and its tributaries are contaminated due to years of mining and treatment activities in the watershed. Most adverse situation exists for COD_{Cr} and organic nitrogen. Also, volumes of the coliform bacteria and thermo-tolerant coliform bacteria show significant non-compliance with the SR GO 296/2005 Coll.

Surface water quality in the Rudniansko-gelnická loaded area

Water course	Sampling site	Number of assessed or detected indicators	Indicators not complying with SR GO No. 296/2005 Coll. of total number of assessed indicators	
			Number	%
Hornád	Pod Spišskou Novou Vsou	17	2	12
	Pod Kluknavou	18	4	22
Rudniansky stream	Ústie	13	3	23
Hnilec	Stratená	17	1	6

Source: SHMI

Ground water contamination

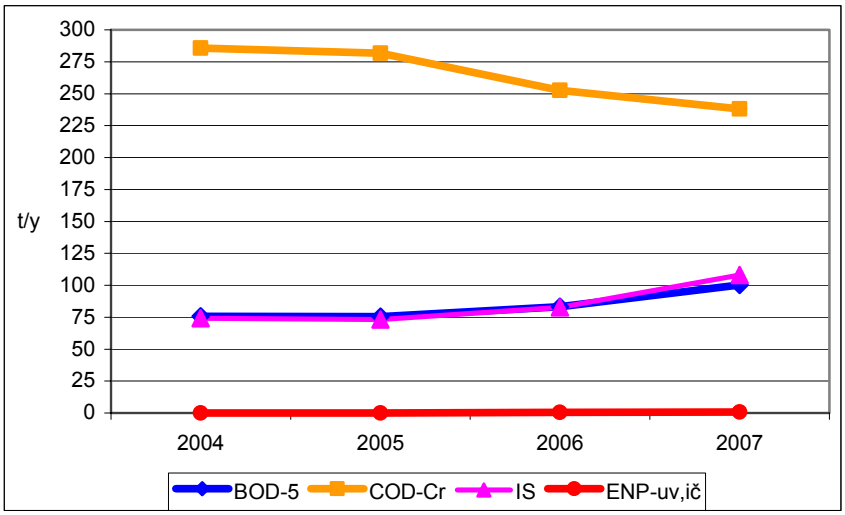
Ground water quality in the affected area is monitored in 4 ground water formations inside pre-quaternary rocks.

Limit values in comparison with requirements of the SR Government Ordinance 354/2006 Coll. in 2007 were exceeded in all groundwater formations inside pre-quaternary rocks reaching into the affected area. The most frequently exceeded indicators include total Fe and Mn. Limit values for heavy metals were exceeded for Al. Organic substances that showed exceeded values include poly-aromatic hydrocarbons.

Sources of water contamination

There is no major water contamination source in terms of volumes of discharged contamination in the SR. Discharged contamination from the WWTPs in Spišská Nová Ves, Gelnica, Margecany, and Krompachy is the biggest contributor affecting water contamination.

Trend in discharging of the pollution from significant resource into watercourses in the Rudniansko-gelnická loaded area



Source: SHMI

♦ **Waste management**

Balance of waste generation

Total production of waste in the area during 2004-2007 showed a fluctuating trend, due to the production of other waste categories that have has a decisive effect on total production of waste within the area. Hazardous waste generation with relatively balanced characteristics showed a significant rise for the monitored year. Production of municipal waste in the area did not show major changes.

Waste production in the Rudniansko-gelnická loaded area

Sort of waste	Waste Production ($t.y^{-1}$)			
	2004	2005	2006	2007
Hazardous waste	1 452.81	1 385.00	2 019.74	8 136.91
Other waste	34 699.48	22 128.52	44 696.36	20 233.03
Municipal waste	7 689.90	7 381.38	7 631.65	8 377.05
Waste production in total	**43 842.19**	**30 894.90**	**54 347.75**	**36 746.99**

Source: SEA, SO SR

Waste handling

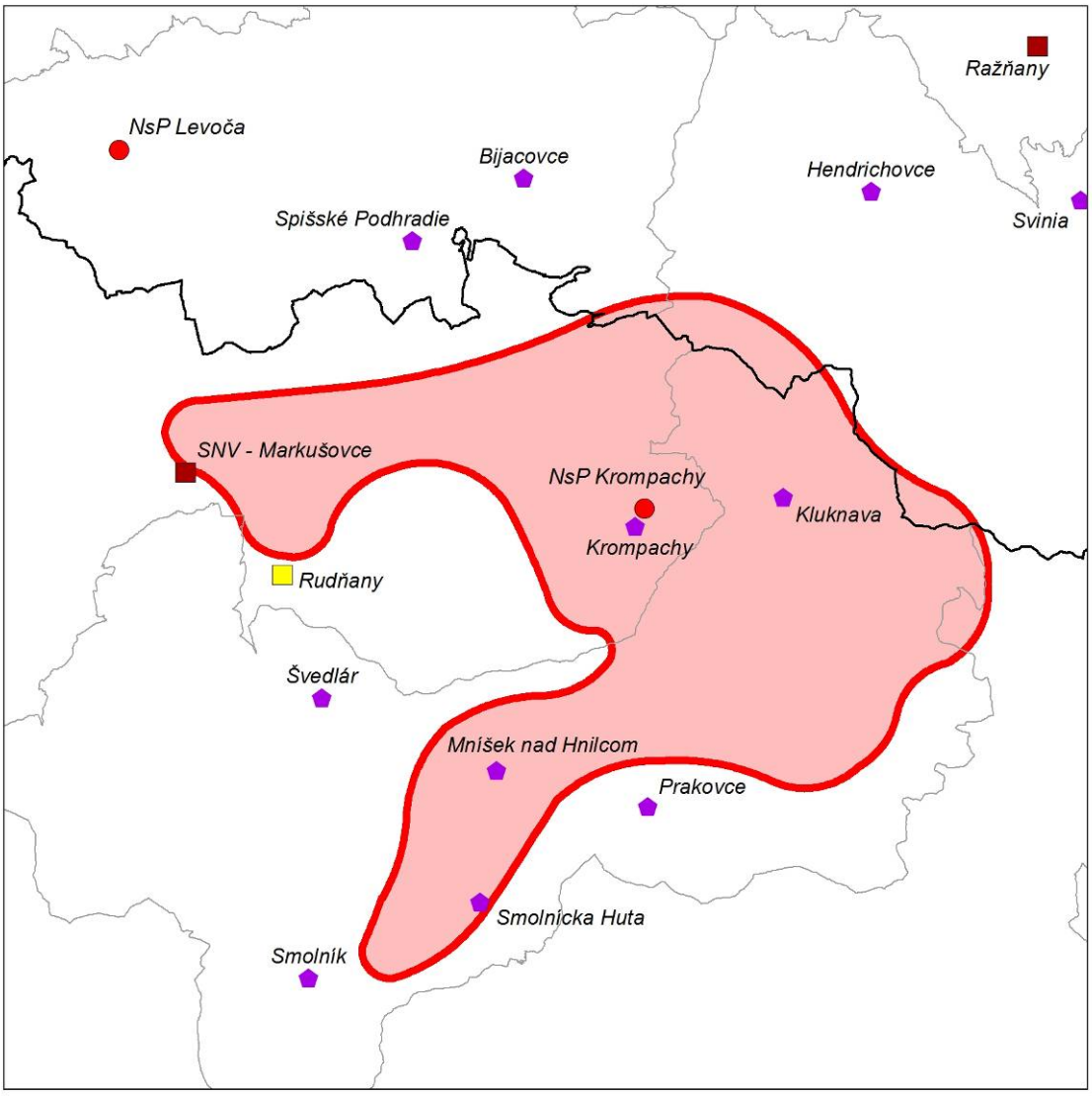
Waste reclamation was the most frequent waste disposal approach in the area. The average 60 % of hazardous waste annual production and 55 % (with the maximum of 88 % in 2004) was reclaimed. Share of individual waste disposal approaches varied. Approaches to waste disposal included mostly other methods to waste disposal together with biological elimination, with minimum degree of landfills and incineration. The average of 3 % of annual production of hazardous waste was disposed of at landfills, together with the average of 4 % of annual production of other waste categories. The average of 7 % of hazardous waste was disposed of through incineration.

Waste handling activities in the Rudniansko-gelnická loaded area

Waste handling	2004		2005		2006		2007	
	Waste amount (t.y^{-1})							
	Hazardous waste	Other waste	Hazardous waste	Other waste	Hazardous waste	Other waste	Hazardous waste	Other waste
Reclamation	821.00	30 349.00	808.60	6 974.51	1 402.71	28 360.22	4 465.46	7 561.74
Disposal through landfills	30.00	2 236.00	63.56	401.31	88.84	1 911.49	36.55	591.44
Disposal through incineration	65.00	170.00	237.45	99.77	116.52	78.44	76.32	155.48
Biological disposal	6.00	612.00	232.15	1 105.50	87.22	0.00	3 193.33	9.90
Other disposal	531.00	1 332.00	43.03	13 547.24	324.49	14 346.22	365.24	11 914.47

Source: SEA

Waste disposal facilities in the Rudniansko-gelnická loaded area in 2007



Waste disposal facilities

- Municipal waste incinerator
- Medical waste incinerator
- Industrial waste incinerator
- Hazardous waste landfill
- Non-hazardous waste landfill
- Inert waste landfill
- Landfill operated under special conditions

Source: SEA

The Košice-Prešov loaded area

♦ Air pollution

Large and middle-sized industrial sources including smelting, mechanical, fuel, and energy industries heavily contribute to air pollution, together with mineral exploitation and incineration. Other local sources include especially automobile exhausts, mineral dust from construction, local heating systems using solid fuel, and re-suspension of solid particles from road surfaces (insufficient cleaning of streets, dirty cars, and anti-skid powdery material on roads).

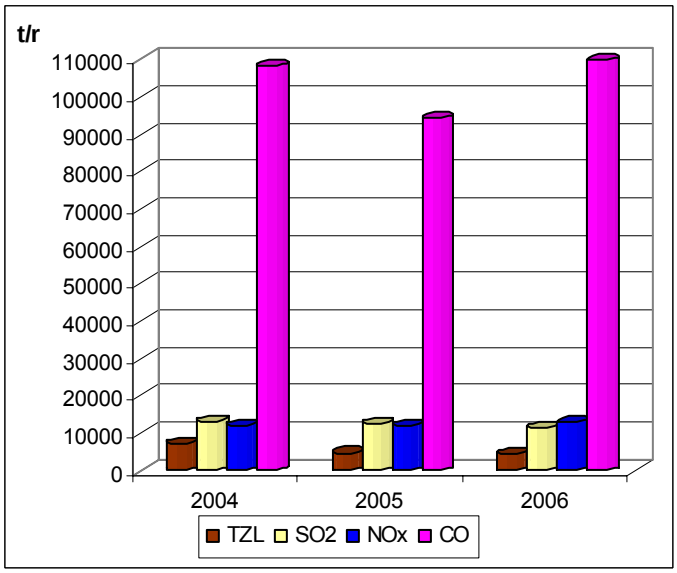
Five major operators of air pollution sources in the Košice-Prešov loaded area

No.	Operator
1.	U.S.Steel Košice, Ltd., Košice
2.	Carmeuse Slovakia, Ltd., plant Košice
3.	Kronospan Slovakia, Ltd., Prešov
4.	Carmeuse Slovakia, Ltd., plant Lomy - lom Včeláre Dvorníky - Včeláre
5.	TEKO, Inc., Košice

In 2006, volumes of pollutants in Košice-Prešov affected area dropped slightly. Only the CO pollutant showed increase by almost 15 000 t/y. NO_2 increased at the Košice-Štúrova due to increased traffic related to construction activities in this area.

24-hour public health limit for PM_{10} was exceeded at the following stations: Košice-Štúrova, Košice-Strojárenská, and Veľká Ida-Letná. The last station showed also exceeded annual PM_{10} limit value.

Emission volumes in the Košice-Prešov loaded area



t/r – tons/year
TZL – PM

Source: SHMI

Lead concentration was measured only at the monitoring station of Veľká Ida-Letná where it increased slightly; however, compared to 2006, the limit value of 500 $ng.m^{-3}$ was not exceeded.

In 2007, there was no single detected case of exceeded information threshold in ground ozone concentration with the duration of one hour (for the "caution" signal). Alarm threshold in ground ozone concentration lasting one hour (for the „warning" signal) at monitoring station was not exceeded.
Average eight-hour ground ozone concentration was exceeded in the affected area.

Air quality management zone was designated for the territories of Košice, Bočiar, Sokoľany, Haniska, urban territory of Prešov, and Ľubotice to monitor the PM_{10} pollutant.

♦ **Surface water contamination**

Hornád and Torysa, together with their tributaries, are the major water courses in the area. Hornád is locally loaded with run-off and industrial waste water produced by the city of Košice. Adverse situation persists especially in the Sokoliansky brook, which is a recipient of industrial waste water from the U.S. Steel Ltd. Košice plant. Sokoliansky brook belongs to the most heavily polluted streams in SR.

Microbiological indicators show the worse situation with the presence of the coliform bacteria, thermo-tolerant coliform bacteria and fecal streptococci that do not comply with SR GO 296/2005 Coll. Limit values significantly exceed the contents of heavy metals, IS_{UV}, organic hydrocarbons, and COD_{Cr}.

Western part of the loaded area is drained into the Bodva water course and its tributaries. Quality of water in these streams shows contamination with microbiological indicators with volumes significantly exceeding the requirements of SR GO 296/2005 Coll. Limit values are significantly exceeded also in the case of Al and absorbable organically-bound halogens.

Surface water quality in the Košice-Prešov loaded area

Water course	Sampling site	Number of assessed or detected indicators	Indicators not complying with SR GO No. 296/2005 Coll. of total number of assessed indicators	
			Number	%
Hornád	Krásna nad Hornádom	29	5	17
	Žďaňa	30	7	23
	Hidasnémeti	58	10	17
Torysa	Kendice	10	1	10
	Košické Olšany	26	4	15
Sokoliansky stream	Tornyosnémeti	56	17	30
Turňa	Ústie	26	3	12
Bodva	Hosťovce	55	9	16

Source: SHMI

♦ **Ground water contamination**

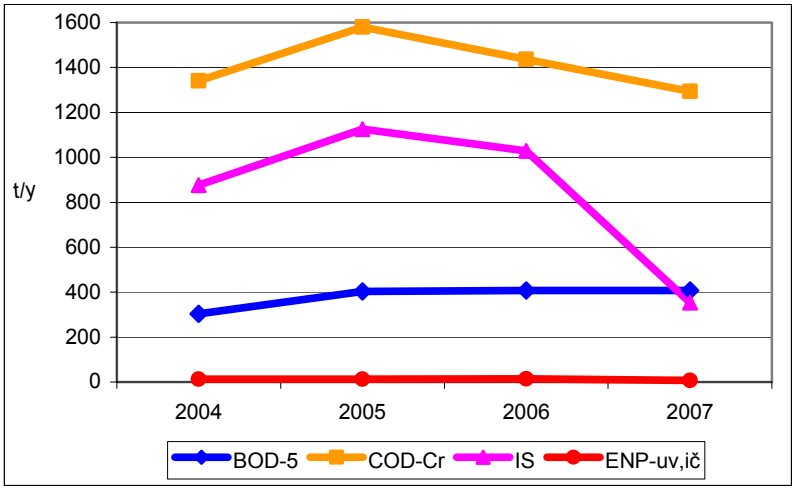
Groundwater quality for the loaded area has been monitored in 1 groundwater formation - in quaternary sediments and in 4 formations of groundwater inside pre-quaternary rocks.

Limit values in comparison with requirements of the SR Government Ordinance 354/2006 Coll. in 2007 were exceeded in all groundwater formations extending into the affected area. The most frequently exceeded indicators include total Fe, and Mn. Limit values for heavy metals were exceeded for Al. Organic substances that showed exceeded values include chlorinated solvents, and poly-aromatic hydrocarbons. Also the limit values for pesticides were exceeded in the formation of groundwater inside quaternary sediments.

- **Sources of water contamination**

Major water contamination sources of local and national significance include WWTP Košice, and WWTP U.S. Steel, Ltd. Košice. Discharged contamination from public sewerage and industrial premises in Prešov, Moldava nad Bodvou, and WWTP Šaca, is the major contributor to water contamination and the reduced water quality.

Trend in discharging of the pollution from significant resource into watercourses in the Košice-Prešov loaded area



Source: SHMI

- **Waste management**

Balance of waste generation

According to RISO data, total production of waste in the area during 2004-2007 showed a fluctuating trend, due to the production of other waste categories that have has a decisive effect on total production of waste within the area. Hazardous waste generation with relatively balanced characteristics increased in the monitored year. Generation of municipal waste in the area showed a mild increase.

Waste production in the Košice-Prešov loaded area

Sort of waste	Waste production ($t.y^{-1}$)			
	2004	2005	2006	2007
Hazardous waste	68 811.16	62 475.89	63 983.21	84 903.97
Other waste	2 115 996.82	1 969 592.96	3 059 699.17	1 284 544.36
Municipal waste	106 351.80	100 071.29	122 442.51	130 514.82
Waste production in total	**2 291 159.78**	**2 132 140.14**	**3 246 124.89**	**1 499 963.15**

Source: SEA, SO SR

Waste handling

The most frequent approach to handling hazardous waste in the area was waste disposal at landfills, with about 68 % of the annual production, while in 2006, 77 % of waste was disposed of through this approach. On average, 4 % of hazardous waste was incinerated, while 13 % was disposed of through other methods. Other waste categories were eliminated mainly through landfills in about 40 % of cases per year, while 18 % was disposed of through other methods. Degree of reclamation of annual

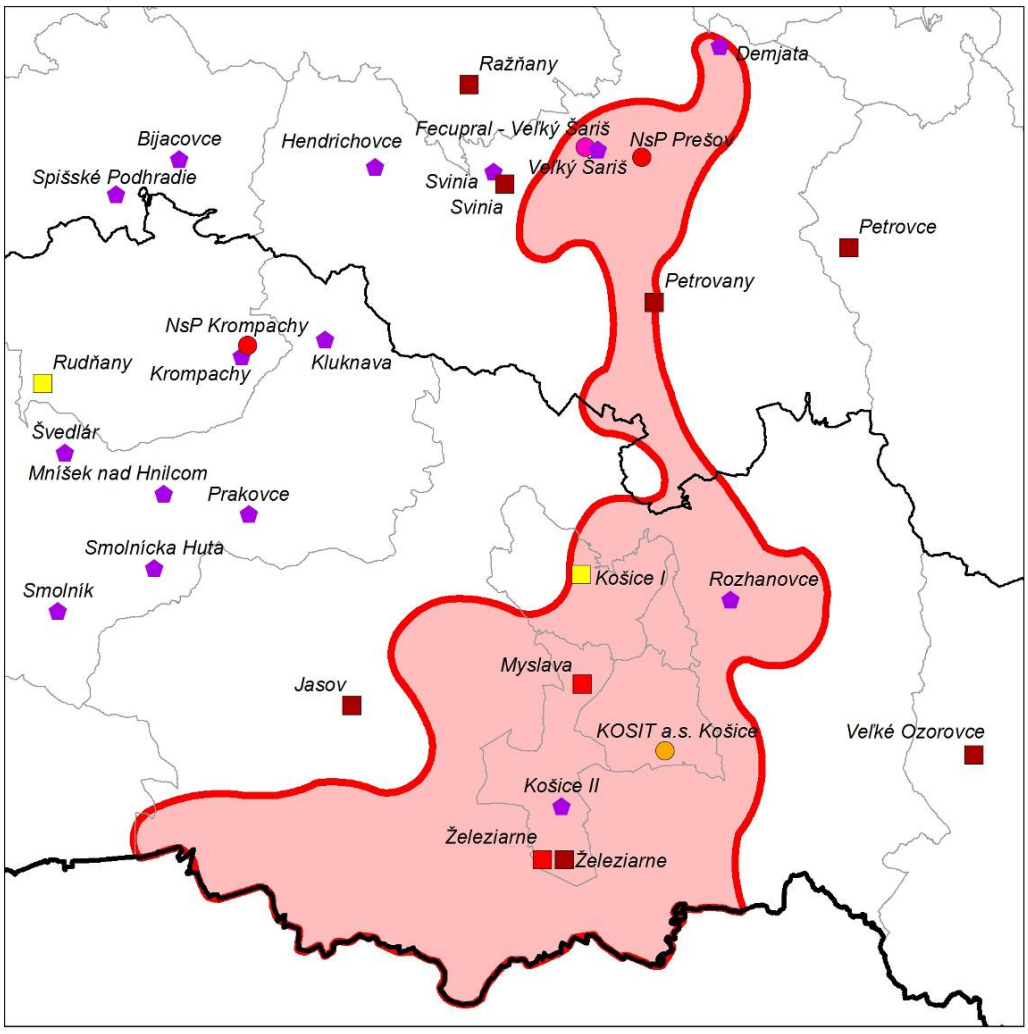
production of hazardous waste was 12 %, while for other waste categories it increased from 13 % in 2004 to about 50 % in the following monitoring period.

Waste handling activities in the Košice-Prešov loaded area

Waste handling	2004		2005		2006		2007	
	Waste amount (t.y^{-1})							
	Hazardous waste	Other waste	Hazardous waste	Other waste	Hazardous waste	Other waste	Hazardous waste	Other waste
Reclamation	4 842.00	277 548.00	8 750.54	1 214 506.50	10 599.23	2 072 274.41	8 177.70	268 798.42
Disposal through landfills	44 407.00	925 820.00	39 349.14	527 416.32	49 260.07	800 293.08	56 511.35	820 804.50
Disposal through incineration	950.00	4 758.00	5 599.96	6 431.17	928.60	4 713.61	5 474.13	11 508.39
Biological disposal	1 157.00	45 642.00	1 736.99	1 665.51	2 037.14	734.77	3 675.58	70.00
Other disposal	17 455.00	862 229.00	7 037.35	219 571.79	1 158.31	181 682.81	11 065.13	183 363.05

Source: SEA

Waste disposal facilities in the Košice-Prešov loaded area in 2007



Waste disposal facilities

- Municipal waste incinerator
- Medical waste incinerator
- Industrial waste incinerator
- Hazardous waste landfill
- Non-hazardous waste landfill
- Inert waste landfill
- Landfill operated under special conditions

Source: SEA

The Zemplín loaded area

♦ Air pollution

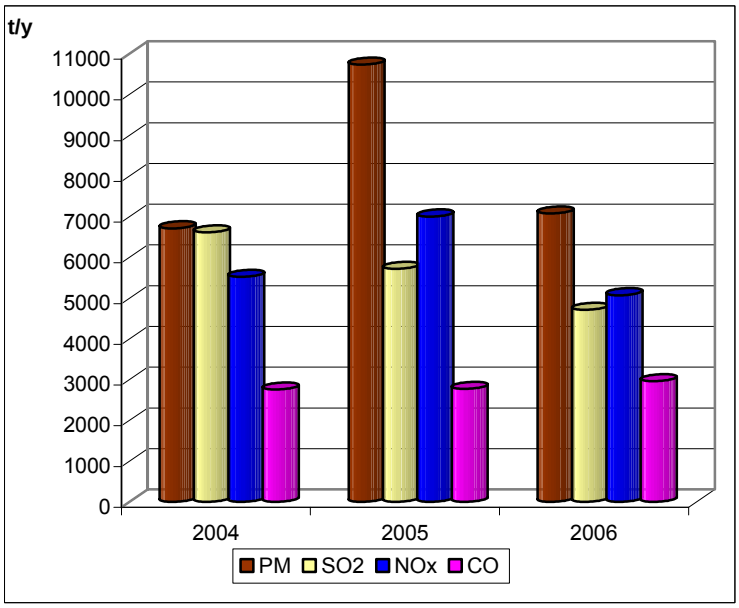
Chemical, wood-processing, fuel, and energy industries play major part in air pollution. Other local pollution sources include mainly transportation, suspension and re-suspension of particles from insufficiently clean roads, construction sites, landfills of powder material, heating of houses with solid fuels, and agriculture.

Five major operators of air pollution sources in the Zemplín loaded area

No.	Operator
1.	SE, Inc., Bratislava, Powerplant Vojany I a II
2.	BUKOCEL, Inc., Hencovce
3.	KERKO, Inc., Michalovce
4.	Vranovská brickyard, Ltd., Vranov nad Topľou
5.	Bukoza Preglejka, Inc., Hencovce

Pollutants in 2007 showed a decreasing trend, with only CO showing a slight increase, following the trend of the recent years. In 2007, 24-hour annual public health limit value for PM_{10} was not exceeded at any monitoring station. Most number of exceeded-value measurements was detected at the Vranov nad Topľou - M.R. Štefánika monitoring station. In 2007, NO_2 annual concentrations in the affected area were not measured at any monitoring station.

Emission volumes in the Zemplín loaded area



Source: SHMI

The monitoring station of Vranov nad Topľou – M. R. Štefánika did not measure lead concentration in 2007.

There was defined an air quality management zone for the territory of Strážske and Vranov nad Topľou and the village of Hencovce to monitor the PM_{10} pollutant. Generally binding decree of the

Regional Environment Office No. 1/2005 of January 11, 2005 promoted the publication of action plan to safeguard air quality related to the PM10 pollutant, for the cadastre areas of Vranov and Topľou, Čemerné, and Hencovce.

- **Surface water contamination**

Major water streams in the area include Ondava, with its tributaries of Laborec and Bodrog. Water quality in Laborec is significantly affected by discharged cooling waste water from the Vojňany electric power plant. This has resulted mainly in the increase of water temperature. Water quality deterioration is caused also by contamination coming from the upper part of the Topľa and Ondava water courses.

Microbiological indicators show the worse situation with the presence of the coliform bacteria, thermo-tolerant coliform bacteria and fecal streptococci that do not comply with SR GO 296/2005 Coll. Limit values also significantly exceed the contents of heavy metals, Al and Zn, organic hydrocarbons, and COD_{Cr}.

Surface water quality in the Zemplín loaded area

Water course	Sampling site	Number of assessed or detected indicators	Indicators not complying with SR GO No. 296/2005 Coll. of total number of assessed indicators	
			Number	%
Laborec	Petrovce	25	4	16
	Ižkovce	34	3	9
Uh	Pinkovce	49	4	8
	Ústie	17	1	6
Ondava	Brehov	36	5	14
Topľa	Pod Vranovom	18	3	17
Bodrog	Streda nad Bodrogom	56	6	11

Source: SHMI

- **Ground water contamination**

Groundwater quality for the loaded area has been monitored in 1 groundwater formation - in quaternary sediments and in 3 formations of groundwater inside pre-quaternary rocks.

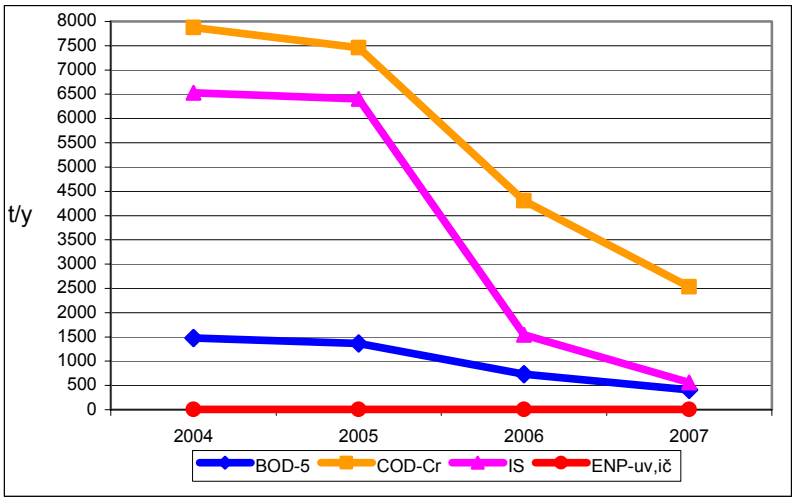
Limit values in comparison with requirements of the SR Government Ordinance 354/2006 Coll. in 2007 were exceeded in one water formation inside quaternary sediments and in 2 groundwater formations inside pre-quaternary rocks reaching into the affected area. Most frequently exceeded indicators include total Fe, Mn, nitrates, chlorides, and ammonium ions. Exceeded limit values for heavy metals include Al, As, and Pb in ground water formation inside quaternary sediments. Organic substances showing exceeded values include 1,2-dichlorobenzene, 1,3-dichlorobenzene in the ground water formation, inside quaternary sediments.

- **Sources of water contamination**

Major sources of water contamination of the local and national importance include Bukocel, Inc., Hencovce, SE, Inc., Vojňany electric power plant, and a WWTP in Humenné. Besides other factors of contamination, the major contributor to water quality situation is discharged contamination from public

sewerages and industrial facilities of Trebišov and Čierna nad Tisou. Discharged contamination from the upper regions of Topľa and Ondava also contributes to a deteriorated water quality.

Trend in discharging of the pollution from significant resource into watercourses in the Zemplín loaded area



Source: SHMI

♦ **Waste management**

Balance of waste generation

Total production of waste in the area during 2004-2007 showed a fluctuating trend, due to the production of other waste categories that have has a decisive effect on total production of waste within the area. In 2005, there was a significant rise in hazardous waste generation followed by a relatively balanced trend ever since. Production of municipal waste did not show major changes.

Waste production in the Zemplín loaded area

Druh odpadu	Waste production (t.y^{-1})			
	2004	2005	2006	2007
Sort of waste	8 404.03	83 725.44	73 549.00	74 085.30
Other waste	541 201.46	398 994.33	495 574.25	368 981.85
Municipal waste	39 697.40	39 188.96	43 954.01	42 348.52
Waste production in total	**589 302.89**	**521 908.75**	**613 077.26**	**485 415.67**

Source: SEA, SO SR

Waste handling

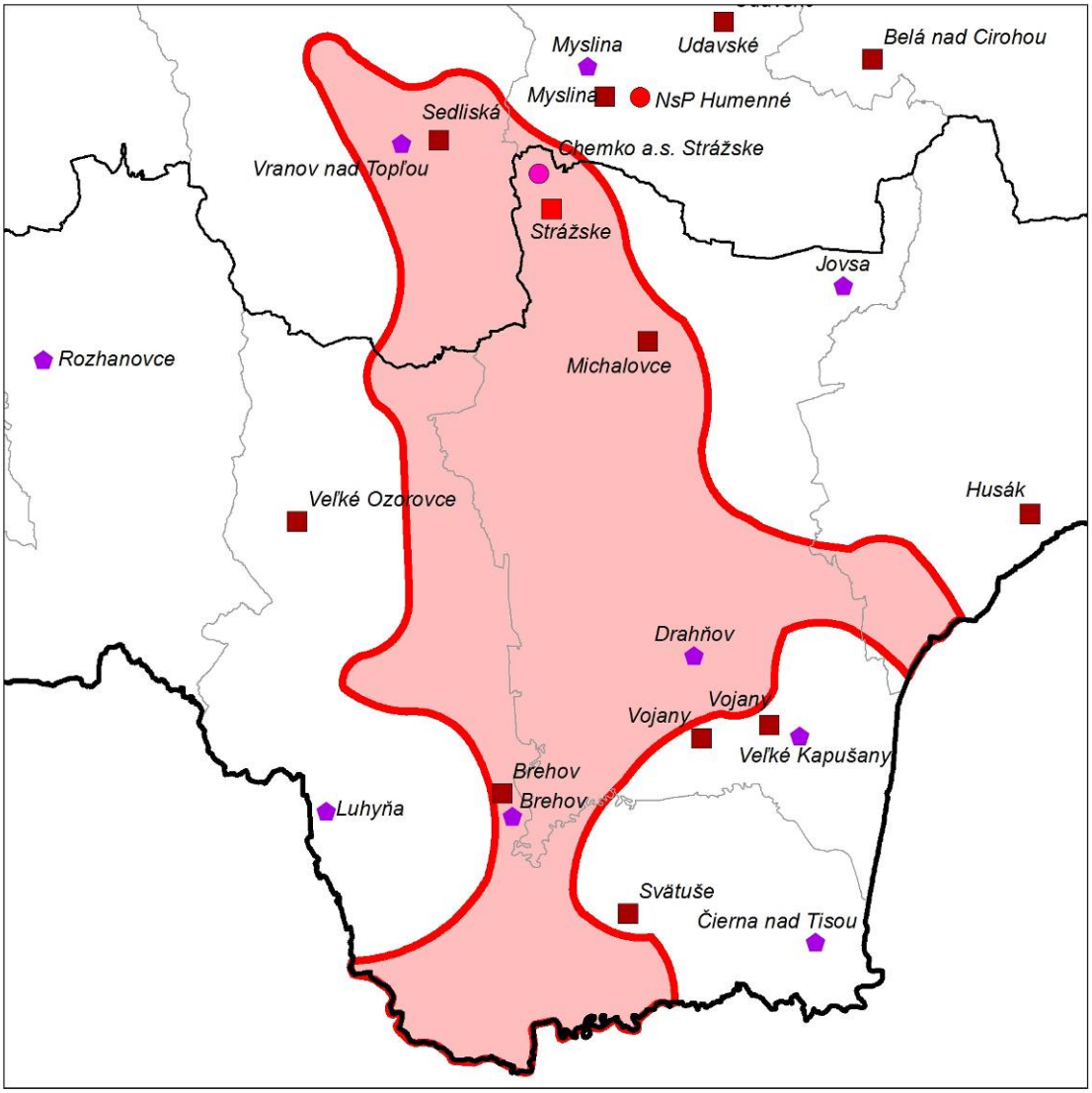
Individual hazardous waste handling approaches in the area show varying characteristics. In 2004, hazardous waste was disposed of through roughly equally distributed disposal approaches, including about 25 % by reclamation, 25 % by landfills, 25 % through biological disposal. and 25 % through other approaches. In 2005, 91 % of hazardous waste was reclaimed and in 2006, 2007 89 % of annual production of hazardous waste was biologically disposed of. The most frequent waste handling activity for other waste was its disposal through landfills (about 76 %), and reclamation (about 19 %) of the annual production.

Waste handling activities in the Zemplín loaded area

Waste handling	2004		2005		2006		2007	
	Waste amount (t.y^{-1})							
	Hazardous waste	Other waste	Hazardous waste	Other waste	Hazardous waste	Other waste	Hazardous waste	Other waste
Reclamation	2 328.00	104 732.00	75 436.24	58 888.63	3 005.37	126 371.77	1 773.66	62 356.91
Disposal through landfills	2 558.00	425 417.00	4 327.79	324 057.80	4 125.80	356 247.02	1 701.65	273 570.99
Disposal through incineration	240.00	11.00	204.86	9.82	211.55	10.26	151.17	90.79
Biological disposal	2 796.00	1.00	2 799.02	6 678.78	64 340.21	29.10	67 514.03	9 887.00
Other disposal	2 810.00	11 040.00	956.86	9 358.98	1 866.08	12 916.11	2 944.79	23 076.16

Source: SEA

Waste disposal facilities in the Zemplín loaded area in 2007



Waste disposal facilities

- Municipal waste incinerator
- Medical waste incinerator
- Industrial waste incinerator
- Hazardous waste landfill
- Non-hazardous waste landfill
- Inert waste landfill
- Landfill operated under special conditions

Source: SEA

*Aiming to the sustainable development, it is important to **create a balance between various activities of the society,** social-economical development and loading limit of the environment or particular elements of environment respectively, while respecting the self-renewable capacities of natural resources.*

National Environmental Action Programme II, adopted by the Slovak Government Decree No. 1 112/1999

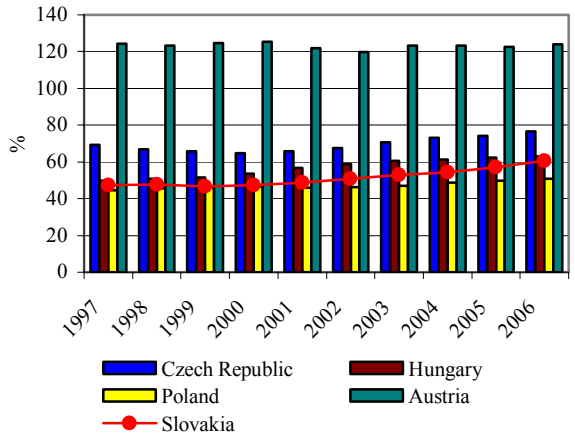
STATE OF THE ENVIRONMENT - CAUSES AND CONSEQUENCES

• ECONOMIC SECTORS AND THEIR IMPACT ON ENVIRONMENT

Economy trend in the Slovak Republic

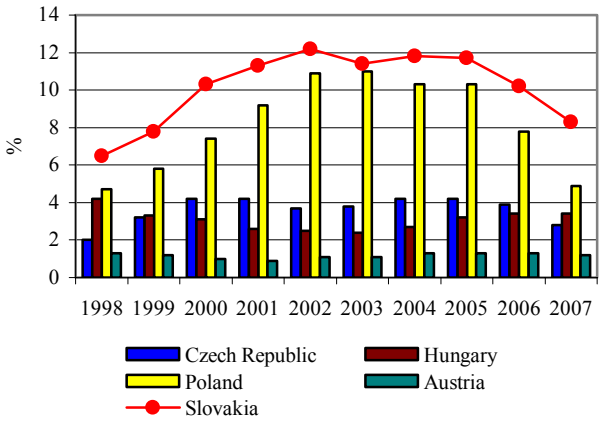
Economy of SR continued to grow in 2007. This was related to the growth in work efficiency, coupled with rising employment rate. In this year, **gross domestic product (GDP)** produced in current prices reached 1 851.8 bill. SKK and in reality increased by 10.4 %, compared to the previous year. This was the greatest year-to-year increment in the history of SR, as well as the greatest real growth in the GDP for the given year from among OECD countries and among all the EU-27 countries. The greatest share on GDP generation at the level of 36.5 % comes from industry.

Trend in GDP per capita in PPS (EU-27 = 100)



Source: Eurostat

Long-term unemployment (more than 12 months)*



*Share to total number of unemployed

Source: Eurostat

In 2007, selective survey of work force showed 291.9 thous. **unemployed** people, with the unemployment rate dropping down to 11 %. However, the Slovak Republic in 2007 showed the highest rate of unemployment as well as the highest rate of long-term unemployment (unemployment beyond 12 months) among the EU-27 countries.

Motor vehicles export represented an important factor for SR in 2007. Compared to 2000, it has grown by about 41 % in value with motor vehicle export belonging to the most important commodity (with 24.2 % share on export). Share of SR on motor vehicle export in 2007 within EU-27 was still only 2.7 % (greatest share reached by Germany - 57 %).

In 2007, **foreign direct investments (FDI)** to the SR economy were 27 359 bill. SKK, including 17 393 bill. SKK into the corporate sphere, and 9 966 bill. SKK into the banking sector.

Industry

- **Share of manufacturing in GDP generation**

Pursuant to the Branch classification of economic activities, there are three basic groups involved in industry: **C** - Mining and quarrying, **D** – Manufacturing and **E –** Electricity, gas and water production and distribution.

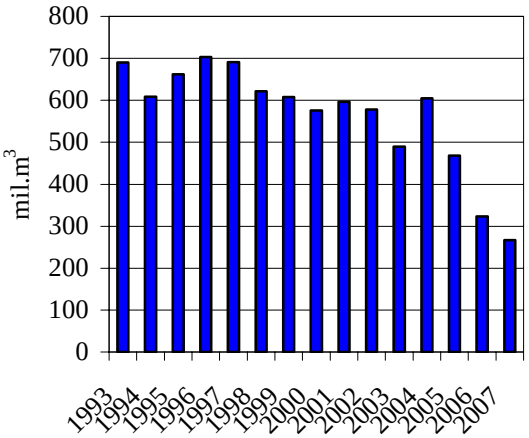
Industry has strengthened its position in the Slovak economy, increasing its **share on GDP generation** in 2007 to 36.5 %. **Industrial production** in 2007 showed increased growth dynamics (13 %), compared to the previous year. There was an increase in industry in the area of mineral exploitation (26.1 %) and industrial production (15.5 %).

- **Demand of industrial production on the exploitation of resources**

Compared to other EU countries, energy demand of the Slovak industry is very high. In 2006, share of industry on total energy consumption in Slovakia reached 42.3 % (in the EU-27 countries it was 27.6 %).

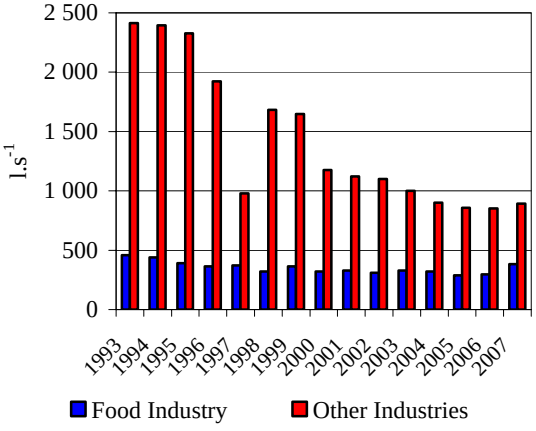
Since 1993, **surface water abstraction** by industry shows a falling tendency. In 2007, surface water abstraction by industry dropped by 61.4 %, compared to 1993. During the year 2007, as much as 81.8 % of total abstractions were industrial. Trends in **underground water abstraction** by industry show analogical tendency.

Development in consumption of surface water in industry



Source: SHMI

Advancement in underground water consumption in industry

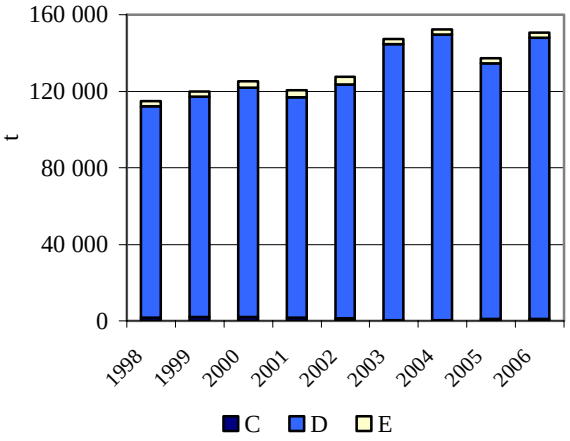


Source: SHMI

- **Impact of industrial production on environment**

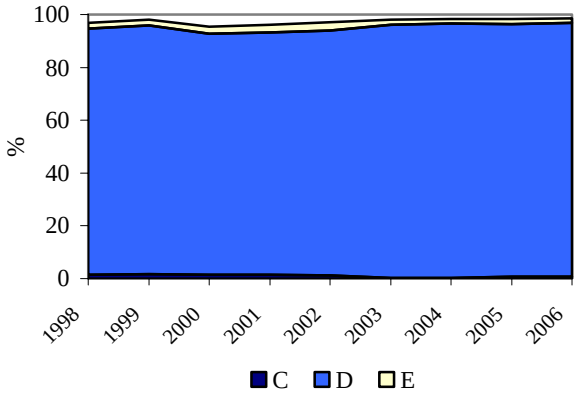
CO emissions from industry in 2006 made up as much as 98.6 % of large-size and middle-size stationary sources and emissions **increased** by 31.1 %, compared to 1998. **SO_2 emissions** from industry in 2006 made up as much as 99.4 % of large-size and middle-size stationary sources and emissions **decreased** by 46.5 %, compared to 1998.

CO emissions trend from stationary industrial sources



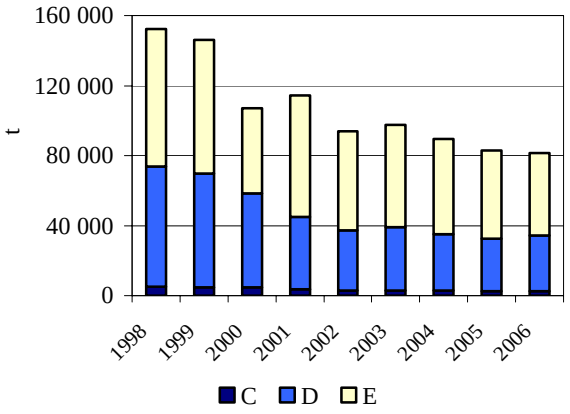
Source: SHMI

Share of CO emissions from stationary industrial sources on the overall CO emissions



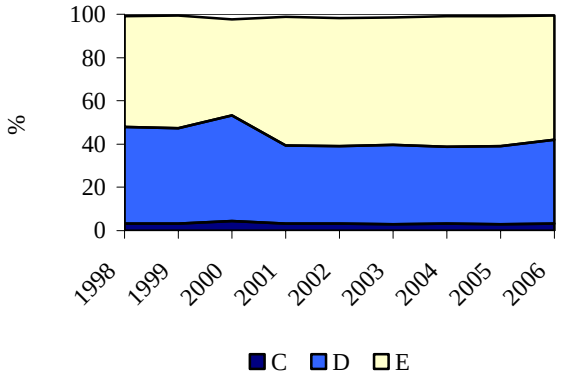
Source: SHMI

SO_2 emissions trend from stationary industrial sources



Source: SHMI

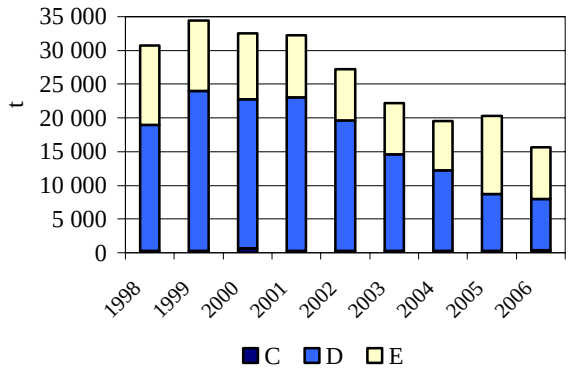
Share of the SO_2 emissions from stationary industrial sources on the overall SO_2 emissions



Source: SHMI

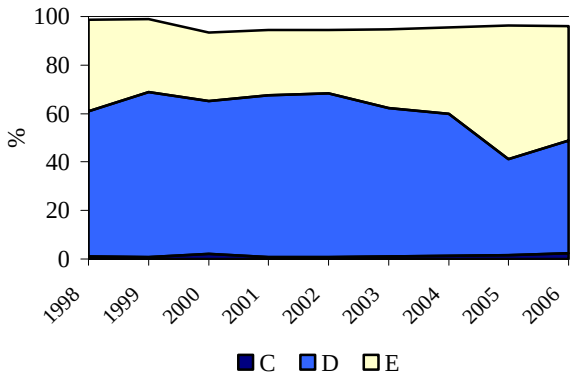
NO_x emissions from industry in 2006 made up as much as 94.4 % of large-size and middle-size stationary sources and emissions **decreased** by 39.4 %, compared to 1998. **SPM emissions** from industry in 2006 made up as much as 96.1 % of large-size and middle-size stationary sources, and emissions **decreased** by 49.1 %, compared to 1998.

SPM emission trend from stationary industrial sources



Source: SHMI

Share of the SPM emissions from station industrial sources on the overall SPM emissions

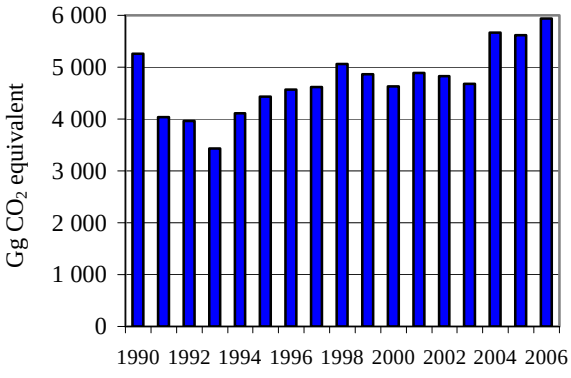


Source: SHMI

Heavy metal emissions by industry have had a decreasing tendency since 1990. In 2006, compared to 1990, only Cd emissions in industrial technologies increased.

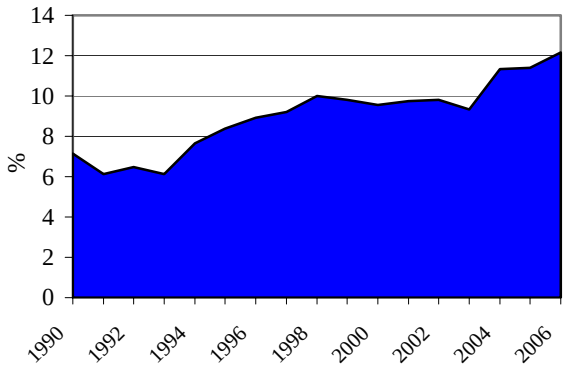
Aggregated greenhouse gases emissions from industrial processes in 1990-2006 had a slightly rising trend. Compared to 1990, in 2006, these emissions from industrial processes increased by 12.9 %.

Trend of aggregated emissions of the greenhouse gases from industry (Gg CO_2 equivalent)



Source: SHMI

Share of the emissions of greenhouse gases from industry on the greenhouse gases overall emissions



Source: SHMI

In 2007, **industry alone generated 5 053 346 tons of waste** (54.5 % share in total waste generation), including **332 869 tons of hazardous waste** and **4 720 477 tons of other waste**.

Extraction of minerals

Changes that occurred in 2007 lead to the reduction in the exploitation of the majority of minerals. Increase trend was in the extraction of limestone and cement raw material.

Trend in extraction of minerals between 1999-2007

Extracted mineral	Measure unit	1999	2000	2001	2002	2003	2004	2005	2006	2007
Brown coal and lignite	kt	4 041.8	3 947.6	3 761.9	3 661.2	3 508.8	3 101.7	2 513.0	2 208.6	1 851. 56
Crude oil. including gasoline	kt	60.264	56.892	54.085	51.770	47.943	42.082	33.15	30.5	24. 49
Natural gas	thous. m^3	218 569	227 038	195 938	200 812	186 797	178 088	150 851	136 881	500 550
Ores	kt	1 083.7	1 104.0	1 047.5	719.2	706.5	977.8	651.89	741.9	666.57
Magnesite	kt	1 423.8	1 535.2	1 573.0	1 464.5	1 640.9	1 668.9	1 555.0	1 467.8	1503.60
Salt	kt	100.2	101.8	104.0	102.7	104.8	104.3	105.1	122.5	116.76
Building stone	thous. m^3	3 473.9	3 540.4	3 881.6	4 478.3	4 503.3	4 527.5	6 016.2	6 309.2	6 528.40
Gravel sands and sands	thous. m^3	2 874.4	2 443.3	2 689.4	2 933.1	3 872.7	3 951.7	4 870.1	5 502.9	5 113.50
Brick clay	thous. m^3	480.3	529.5	442.1	433.4	507.4	591.7	466.8	508.0	1 011.70
Limestone and cement raw materials	thous. m^3	294.1	320.2	302.3	332.7	384.9	569.5	690.6	673.5	627.10
	kt	1 398.1	1 419.5	1 614.6	1 547.4	1 649.4	3 479.8	3 743.3	4 131.2	4 107.80
Limestone for special purposes	thous. m^3	200.9	299.4	292.3	833.0	941.4	14.9	28.50	67.0	90.30
	kt	320.0	345.0	325.0	0.0	0.0	1 057.5	834.80	1 243.6	1 175.70
High-content limestone	kt	4 603.4	4 176.5	4 211.1	4 356.8	4 093.0	3 767.3	4 053.5	4 393.0	4 362.00
Other raw materials	thous. m^3 surface	896.1	983.7	1 026.9	1 216.8	1337.2	567.8	509.1	531.6	476.50
	kt under-ground	120.0	127.7	142.3	86.4	86.2	91.6	106.5	115.3	139.40
	kt surface	0.0	2.4	32.30	31.1	11.8	1 143.9	1 024.0	1 279.3	1 457.45

Source: MMO SR

Brown coal and lignite extraction in 2007 dropped again. Individual mines showed 357.03 kt of extracted volumes less than in 2007. This is the lowest extraction volume since 1997. Compared to 2006 the number of workforce in this industry decreased by 31.4 %.

Crude oil, gasoline, and natural gas extraction was also decreased, compared to the previous year. Total extracted volumes included 22 293 t of semi-paraffin crude oil, and 2 237 t of gasoline. Natural gas stores decreased by 500 550.2 thous. m^3.

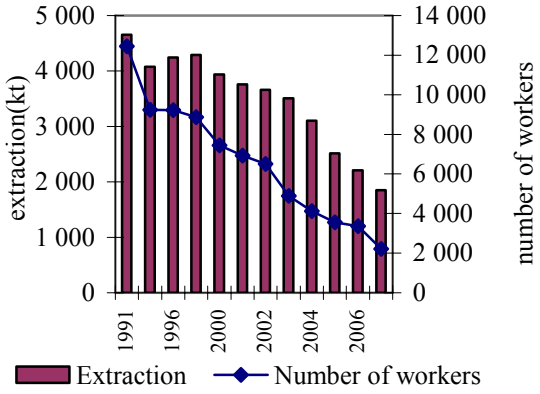
Exploitation of **ore minerals** decreased. The Siderit, Ltd. company in Nižná Slaná has the biggest share on all ore volumes, (640.3 kt). The Slovenská banská Ltd. company in Hodruša Hámre, contributed by 15 kt.

In 2007, there was a slight increase in exploitation of **non-ore raw material.** However, 1 503.6 kt of *magnesite* was extracted at three significant magnesite deposits (Jelšava, Lubeník, Hnúšťa), which is a increasing by 35.8 kt, compared to the previous year.

In 2007, exploitation of *rock salt* (Solivary, Prešov) was at the level of 116.3 kt of salt in salt water. The amount of salt decreased by 6.2 kt compared to 2006.

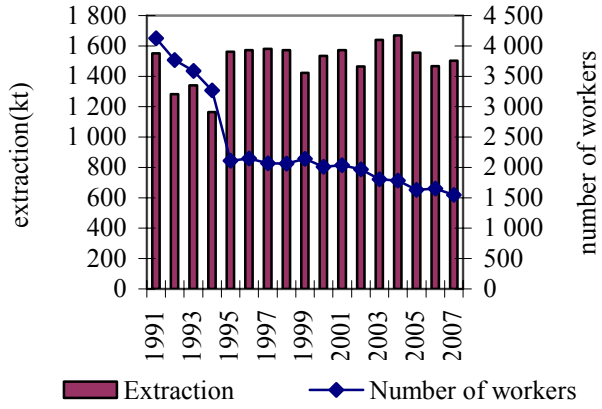
Basic indicators of mineral extraction trend in SR between the years 1991-2007

Trend in brown coal and lignite extraction



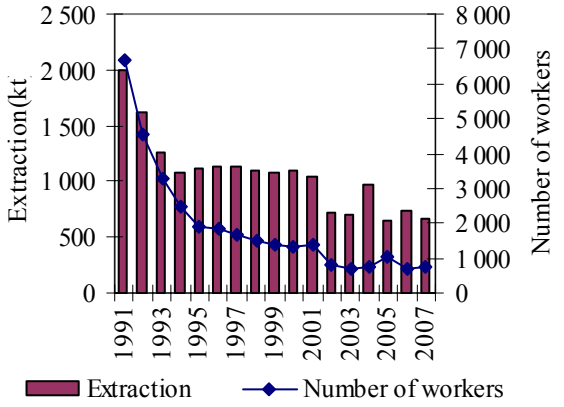
Source: MMO SR

Trend in magnesite extraction



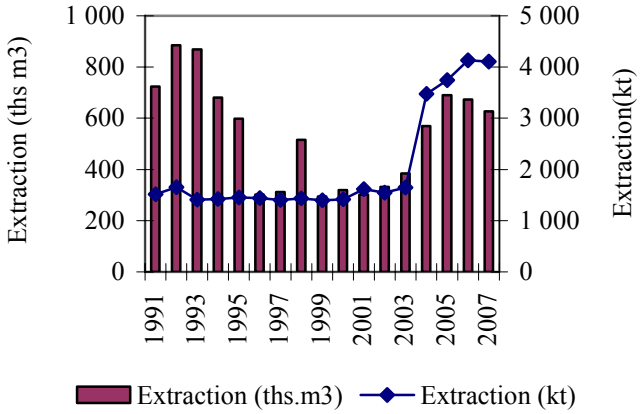
Source: MMO SR

Trend in ores extraction



Source: MMO SR

Trend in limestone and cement materials extraction



Source: MMO SR

♦ **Environmental impact of mineral exploitation**

Mineral extraction is demanding in terms of environmental protection. SGIDS has been commissioned, to keep a register of abandoned mining works. As of December 31, 2007, the register had 16 576 objects left after abandoned mining activity.

The Central mining office keeps records of current mining works including **dumps** and **tailings dumps.** As of December 31, 2007, there were 85 active (64 in the extraction site, 21 outside the extraction site) and 26 inactive **dumps** (26 in the extraction site, none outside of it) left after the extraction of minerals, and also 27 active (17 in the extraction site, 10 outside the extraction site) and 19 inactive (12 in the extraction site, and 7 outside the extraction site) **tailings dumps.** Compared to the previous year, territory with located dumps increased, while the area of tailings dumps decreased only slightly.

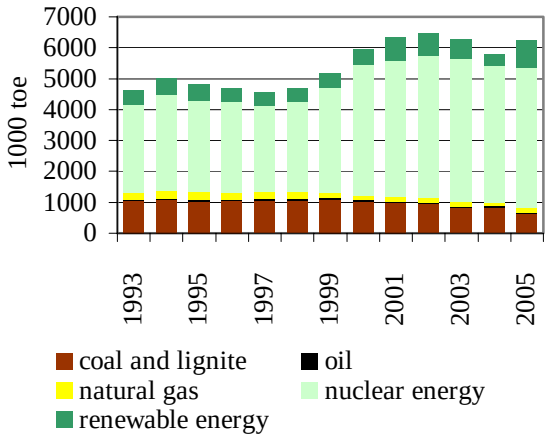
Energy management, Heat production and Gas management

- **Energy sources balance**

SR ensures almost 90 % of the primary energy sources (PES) through purchase outside the internal EU market. The only significant domestic energy source is brown coal, which covers 79 % of brown coal consumption needed for electricity and heat production. Domestic exploitation of natural gas and crude oil is not significant.

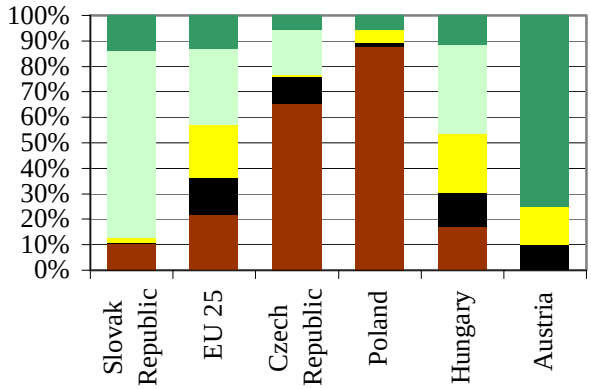
Structure of exploited PES in the SR since 1997 is typical for the increased consumption of gas fuels and renewable energy sources at the cost of consumed solid fuels, also due to more strict emission limits. Utilization of nuclear fuels in recent years plays an exceptionally significant role in the PES structure of the SR. We expect only a slight increase in crude oil consumption, especially in the sector of transportation, due to the replacement of crude oil-based components with bio-fuels.

Trend in used primary energy sources in the SR



Source: EUROSTAT

Structure of primary energy sources in 2005 – international comparison

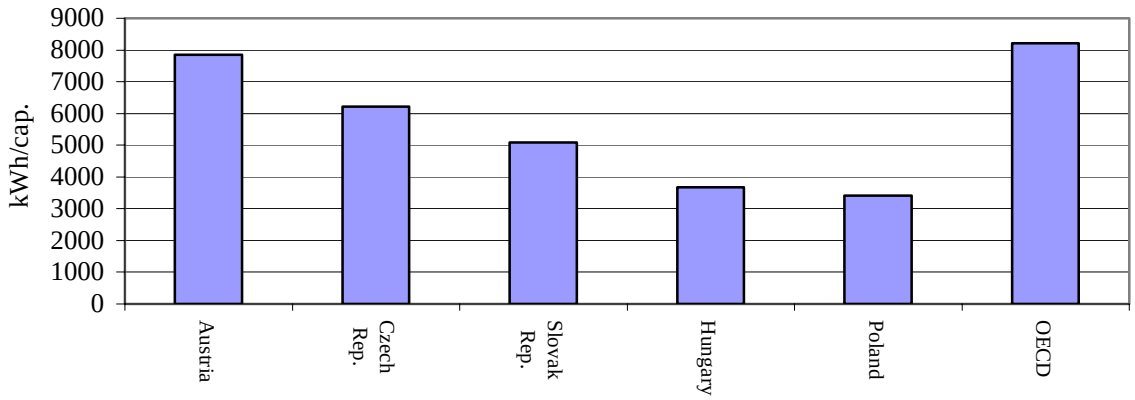


Source: EUROSTAT

Consumption of primary energy sources per capita in the SR is still lower than in the EU 15 countries, which is less than 150 PJ per capita. Although it showed some increase in the last year, it currently does not reach more than 90 % of the EU average.

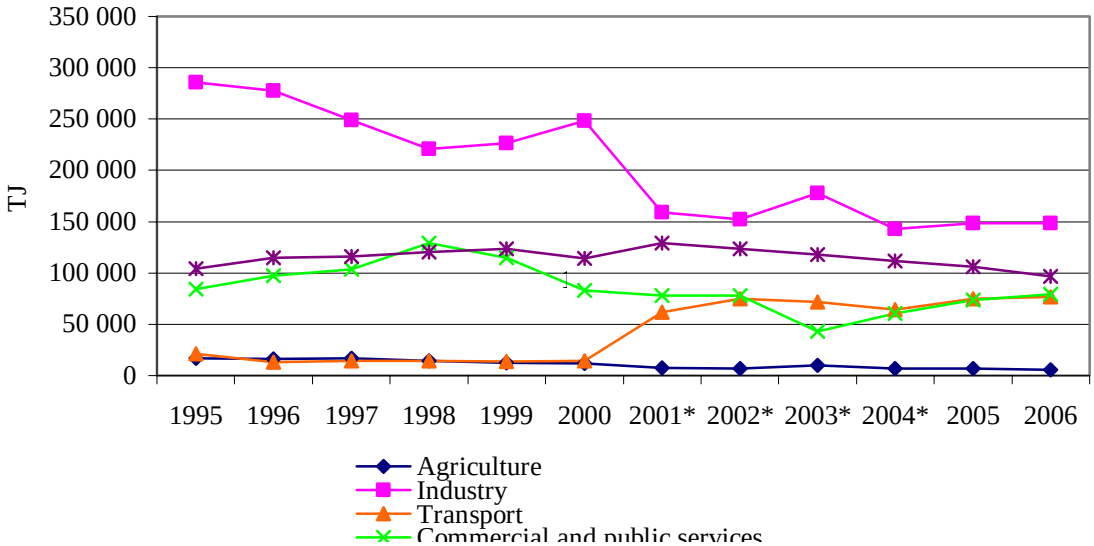
Electricity consumption per capita in 2006 – international comparison

Source: IEA



Of all sectors, industry has the greatest final consumption in all fuel types in the SR. Compared to the other EU countries, a relatively low household consumption has not changed, while the sector of transportation shows increased energy consumption since 2000.

Trend of final energy consumption in sectors of economy



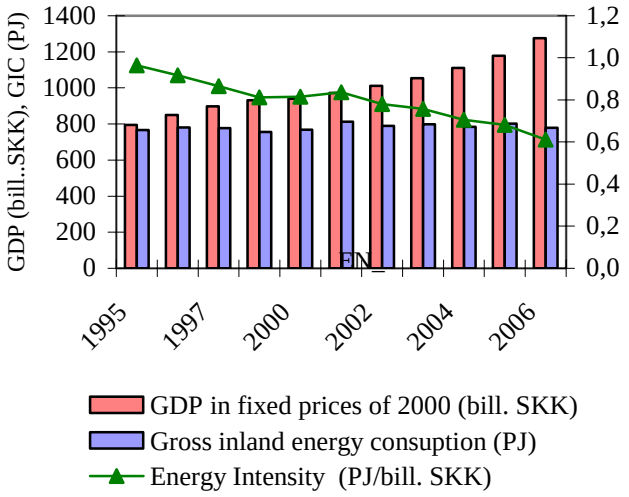
Source: SO SR

♦ **Energy intensity**

Energy intensity (EI) is an important economic indicator also used to make international comparisons. It is defined as the share of the gross inland energy consumption (GIC) on the generated GDP (GIC/GDP=ED). Over the recent years, the GDP growth was accompanied by a balanced consumption of energy sources and a drop in the final energy consumption. Since 1993, energy intensity has been decreasing every year by 4 %, caused mainly by more development in the value added production, as well as by introduction of rationalization measures in production and consumption alike.

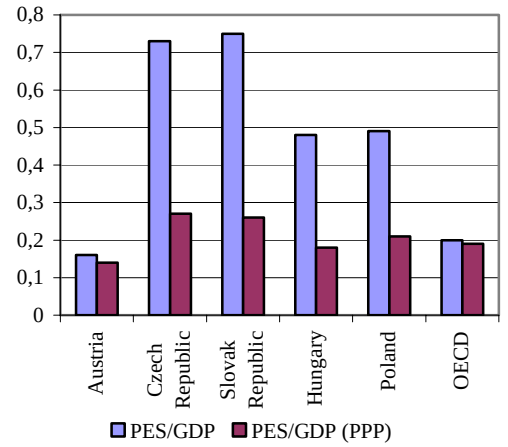
Notwithstanding this positive trend, the EI in Slovakia is still about 1.5-times higher than the average consumption of the OECD countries.

Trend in selected indicators of energy intensity in SR



Source: SO SR

Energy intensity in 2005 – international comparison



Source: IEA

Note:
PES/GDP (toe/USD) – energy intensity by PES,
PES/GDP – PPP (toe/USD) - energy intensity by PES, expressed through the purchase power parity (PPP) that evaluates movements in exchange rates in prices over long time periods. Thus, the differences among individual countries are reduced.

- **Electricity power management**

Present composition of installed outputs of the SR sources is equally distributed among the nuclear, heat, and hydro power plants. More that a half of the electricity production is provided by nuclear power plants, while thermal power plants represent app. 30 % of the production, the rest of the produced electricity comes from hydro power plants.

Generation station capacity according to the type in SR (MW)

Indicator	1999	2000	2001	2002	2003	2004	2005	2006
Nuclear power plant	2 200.00	2 640.00	2 640.00*	2 640.00*	2 640.00*	2 640.00*	2 640.00*	2 640.00*
Thermal power plant	3 132.68	3 144.92	3 190.00*	2 929.00*	3 319.04*	3 120.00*	3 090.00*	3 049.87*
Hydro power plant	2 419.62	2 420.52	2 470.00*	2 505.00*	2 507.46*	2 518.00*	2 488.00*	2 507.52*
Total	7 752.30	8 205.44	8 300.00*	8 074.00*	8 466.50*	8 278.00*	8 218.00*	8 197.39*

Source: SO SR, MoEC SR

Note: The output of the thermal power plants includes also the output of the gas-fired and combustion power units.
* Data taken from revised methodology SO SR 2002

In 2006, total produced electricity in the SR energy network dropped on the year-to-year basis by 2 809 GWh to 29 291 GWh.

Overall domestic electricity consumption dropped on the year-to-year basis by 9.33 % to 26 026 GWh.

- **Gas management**

Slovak Gas Management Industries in Bratislava is the dominant company on the Slovak gas market, with the greatest market share. In 2007, the company provided services to approximately 1.466 mil. of clients in various segments (bulk clients, small clients, and households).

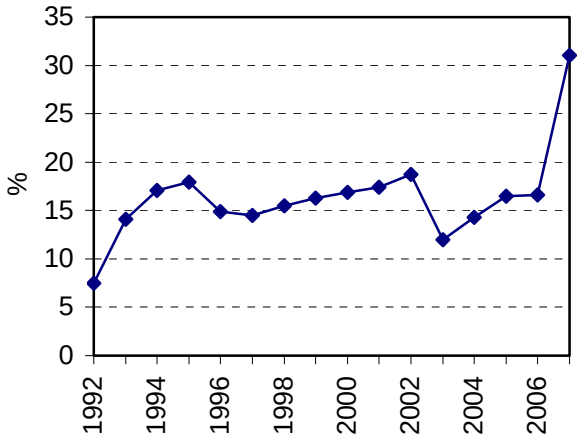
In 2007, most of domestic gas consumption is imported from the Russian Federation (5.4 bill. m^3). Compared to 2006, the sale of natural gas on the designated Slovak territory in 2007 dropped from 6 283 mil m^3 to 5 680 mil m^3.

The Slovak gas distribution system is interconnected with the neighboring countries' networks, specifically with Ukraine, Czech Republic and Austria. Capacity of the transport network is more than 90 bill. m^3 annually.

- **Renewable energy sources (RES)**

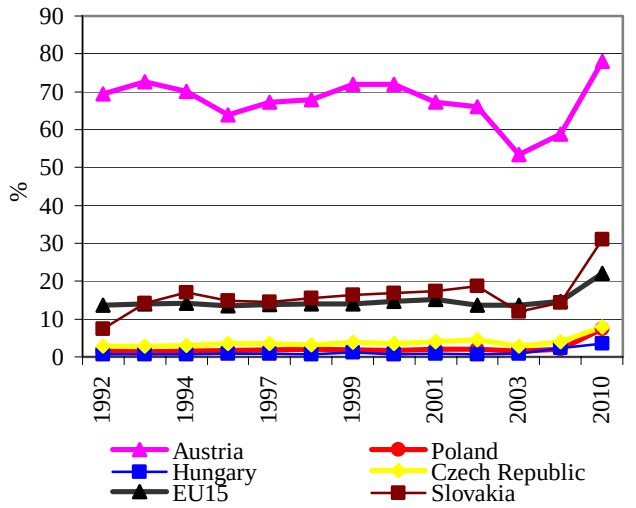
Increase in renewable energy sources extraction represents a significant element in the system of measures introduced to meet the Kyoto Protocol's objectives. Share of electricity produced from the RES (renewable energy sources) on total electricity consumption in 2007 was 16.0 %. Hydro power plants have the greatest share on electricity production from all RES in Slovakia (more than 90 %). For this reason, volumes of electricity produced within the Slovak RES network fully depend on favorable hydro-energy conditions. Biomass is the dominant RES used to produce heat.

Share of electricity from renewable energy to gross electricity consumption



Source: EUROSTAT

Share of electricity from renewable energy to gross electricity consumption – international comparison

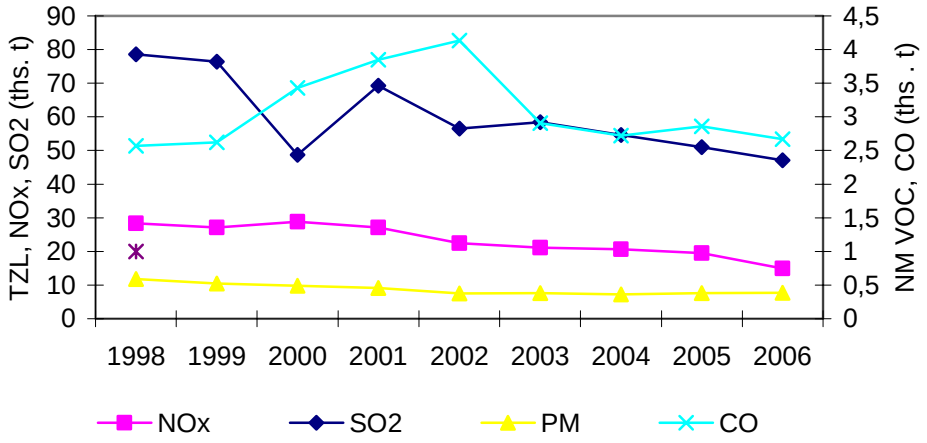


Source: EUROSTAT

- **Air pollution caused by energy production**

Over the recent years, sulfur oxides (SO_2), nitrogen (NO_x), and particulate matter (PM) emissions were reduced significantly. This situation was caused by decreased production and consumption of energy and a shift in the fuel base toward more purified fuels, as well as by using fuels with better quality characteristics.

Trend of basic polluting substances emissions from energy stationary sources in the SR (thousand tons)



Source: SHMI

Power management sector has the most dominant share on the greenhouse gases emissions. In 2006, the share was almost 80 % of total greenhouse gases emissions in the SR. Compared to 2000, total greenhouse gases emissions in the SR in 2006 dropped by 36.5 %.

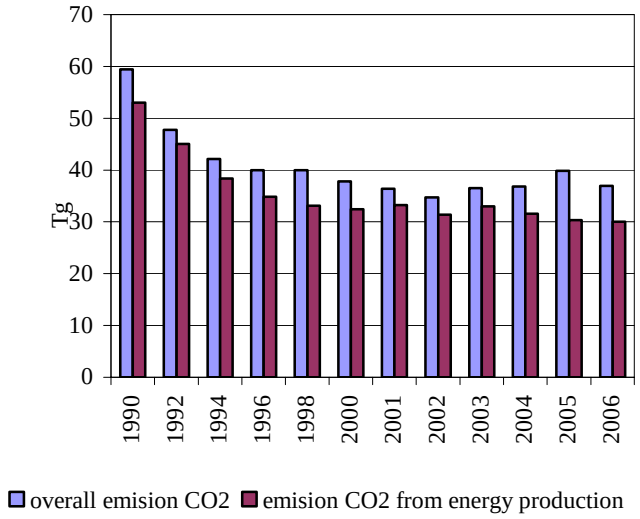
Trend of greenhouse gasses emissions from energy production in the SR (Tg CO_2 equivalent)

	1990	1992	1993	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Energy sector*	58.59	47.23	44.37	42.60	43.19	43.39	41.66	40.56	37.82	40.64	38.55	39.03	37.81	37.40	37.19

*transport included

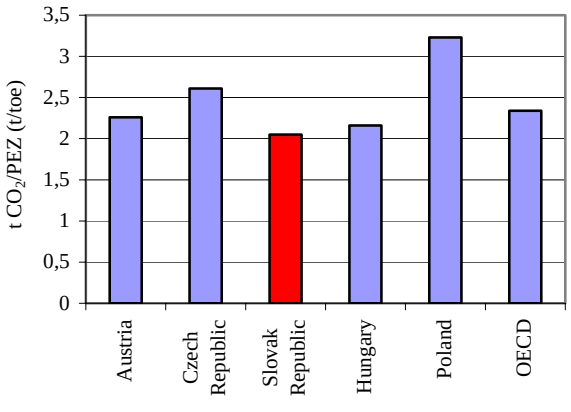
Source: SHMI

Trend of CO_2 emissions from energy production



Source: SHMI

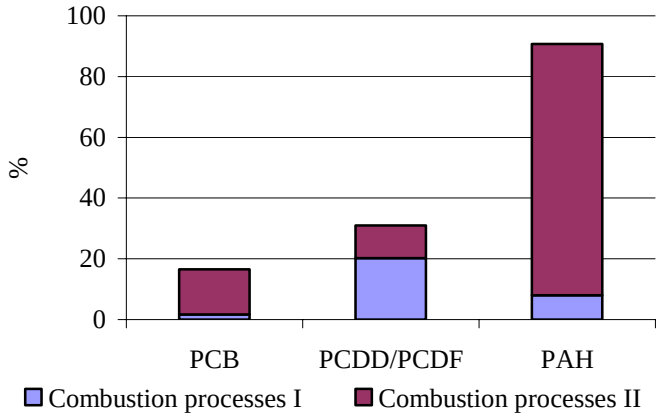
Energy Intensity according to CO_2 in 2005 – international comparison



Source: IEA

The POP emissions have a falling tendency since 1990. This is caused by a drop in the production and changes to fuels used for household heating. Fluctuations in the PCB emissions (their increase) in 2003 and 2004 relates to the increased consumption of firewood for household heating.

PCB, PCDD/PCDF and PAH emissions from energy production in 2006



Source: SHMI

Positive trend in the power management sector is recorded mainly by a dramatic reduction to **heavy metals emissions** (Pb, As, Cu, Ni, Zn). In the 2006 emission of Cr, Ni and Mn from power management sector accessed the 10 % share of total emission of heavy metals.

- **Waste water from electricity production and gas management**

Of all areas within the energy sector, electricity power management contributed the most to total volumes of discharged wastewater. Wastewater produced by electric power plants mainly includes water from technological and cooling processes, and also some runoff water. Wastewater from technologies is chemically contaminated. In case of nuclear power plants, water from the primary cycle also shows a degree of radio-chemical contamination. Water used as a coolant shows mostly thermal contamination. Greatest load exists in the chemical oxygen demand for the CODCr (dichromate) indicator, and insoluble substances (IS).

Waste water discharged by energy production in 2006

Waste water from electricity production	Volume (thousand $m^3.y^{-1}$)	IS ($t.y^{-1}$)	BOD_5 ($t.y^{-1}$)	COD_{Cr} ($t.y^{-1}$)	ENP_{uv} ($t.y^{-1}$)
Treated	16850.067	108.732	29.424988	295.8140	0.415975
Untreated	64277.791	145.7276	3.258854	26.05199	0
Subtotal	81127.858	254.4596	32.68384	321.8660	0.415975
Waste water from heat production					
Treated	1414.054	11.72186	4.000295	15.94265	0.217793
Untreated	634.129	2.353763	0.088627	0.446672	0.001056
Subtotal	2048.183	14.07562	4.088922	16.38932	0.218849

Source: SHMI

- **Waste from electricity production and gas management**

In 2006, the SE company, Inc. produced total volumes of 1 132 888 tons of waste of all categories, including 99.3 % from the „other waste“ category.

The SPP Inc. company produced 12 169 tons of waste in 2006, including 10 154 tons of other waste, and 2 015 tons of hazardous waste.

Transport

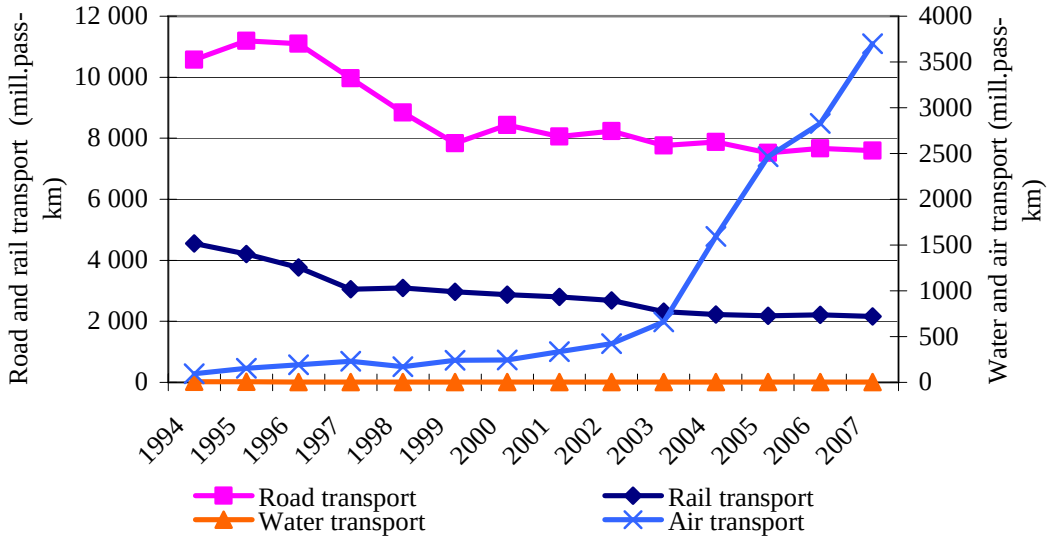
- **Passenger and freight transport**

In the area of road and railway passenger transport, the trend of long-term drops in transported passengers and total transport performances contuinued. Compared to 1993, reduction in modal split in road passenger transport was more than 30 %, in case of the railway transport the reduction was even by more than 50 %. Modal split in water passenger transport dropped by more than 40 %.

There was a significant rise in modal split in air passenger transport in the monitoring period of 1993-2007 (from 37 mil. person-kilometres in 1993 to 3 699 mil. person-kilometres in 2007)

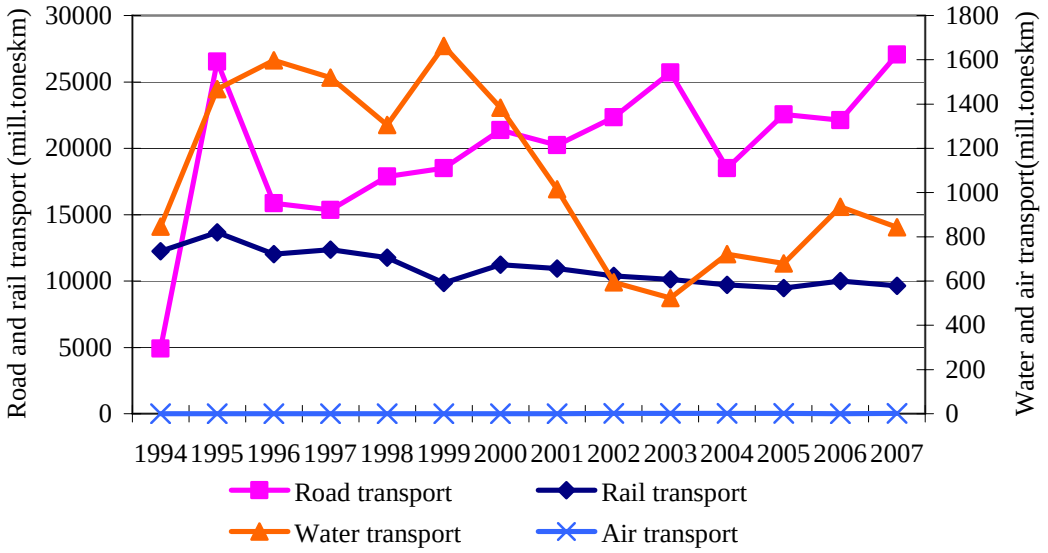
Transport of goods and modal split in road freight transportation grow continually. Road transport shows the greatest share on modal split by cargo transport – app. 70 %. Modal split by railroad cargo transport dropped by more than 30 %, compared to 1993, while modal split by aquatic cargo transport in 2007 stayed on the same level as in 1993.

Passenger transport demand by mode (mill. pass-km)



Source: SO SR

Freight transport demand by mode (mill. tkm)



Source: SO SR

MHD companies of Bratislava, Košice, Prešov, and Žilina operate the municipal mass passenger transport (MHD).

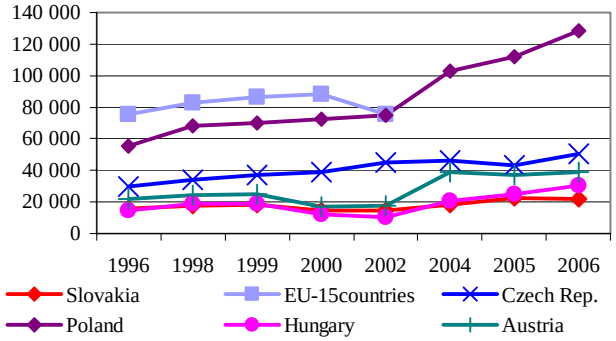
Over the period of 14 years (1993-2007), there was reported a 23.3 % decrease in the number of carried passengers. Compared to 1993, slight growth was recorded only in 1996 (3.3 %) and 1997 (0.3 %). Buss transportation has over the monitored time period been the major player in passenger transport, followed by tram and trolley buss transportation.

Indicators of city transport

Indicator	1993	1997	1999	2000	2002	2003	2004	2005	2006	2007
Total number of transported passengers (ths.)	525 744	527 662	485 472	404 539	370 018	394 465	383 118	395 064	400 673	403 466
Trams										
Transported passengers (ths.)	188 768	139 668	117 714	100 185	96 553	104 560	104 391	109 101	109 836	109 705
Seat kilometres (mill. km)	2 734	1 301	1 888	1 802	1 780	1 764	1 818	1 822	1 797	1 792
Trolleybuses										
Transported passengers (ths.)	43 346	74 020	71 934	62 997	54 707	59 034	57 688	58 032	59 071	60 655
Seat (mill. km)	717	796	1 039	1 029	1 048	1 110	1 103	1 075	1 085	1 104
Buses										
Transported passengers (ths.)	293 629	313 974	295 824	241 357	218 758	230 871	221 039	227 931	231 766	233 106
Seat (mill. km)	4 998	3 146	4 638	4 011	3 990	3 899	3 881	3 846	3 823	3 839

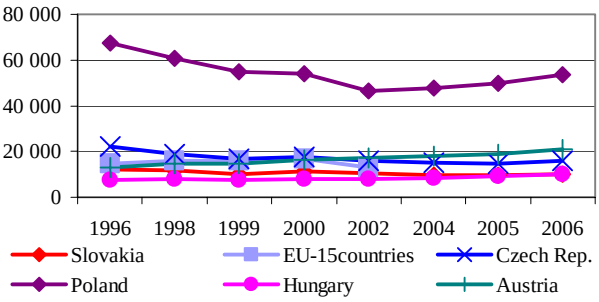
Source: SO SR

Freight transport demand by road (mill. tkm)



Source: EUROSTAT

Freight transport demand by rail (without passenger cars) (mill. tkm)



Source: EUROSTAT

- **Number of vehicles**

Total number of motor vehicles in 2007 over the period on 1993-2007 grew by 27 %. Major increase in the number of motor vehicles in 2007 was recorded in the categories of heavy trucks and pickup trucks (grew by 90 %, compared to 1993), and passenger cars (grew by 44 %, compared to 1993). Number of transport vehicles in railroad and water transport types (being the most environmental-friendly transport modes for passengers and goods) dropped by appr. 24 % over the last 12 years.

Number of motor-vehicles by individual types (pcs)

Total number of vehicles	1993	1997	1998	2000	2002	2003	2004	2005	2006	2007
Passenger cars	994 933	1 135 914	1 196 109	1 274 244	1 326 891	1 356 185	1 197 030	1 303 704	1 333 749	1 433 926
Trucks and Pick up vans	101 552	103 080	111 081	110 714	130 334	142 140	140 395	160 089	172 781	196 141
Special vehicles	46 121	45 376	43 690	39 188	34 150	32 033	22 672	22 648	18 708	18 983
Road tractors	*	600	1 721	3 281	6 837	8 851	11 435	14 141	16 475	19 556
Buses	12 655	11 325	11 293	10 920	10 589	10 568	8 921	9 113	8 782	10 480
Tractors	65 150	63 145	63 448	64 351	62 644	61 690	44 080	46 544	43 888	44 098
Motorcycles (excl. small)	81 263	81 062	100 891	45 647	47 900	48 709	51 977	56 366	58 101	63 897
Trailers and Semi-trailers (included bus)	167 174	182 893	191 241	201 269	213 167	218 517	170 491	188 411	188 256	199 329
Others	-	-	-	2 226	1 306	1 161	-	101	535	3 414
Total	**1 468 848**	**1 623 305**	**1 719 474**	**1 751 840**	**1 833 818**	**1 879 854**	**1 647 001**	**1 801 117**	**1 841 275**	**1 989 824**

[1] in 1993-1996 included among special vehicles, since 1997 newly-purchased and monitored independently

Source: SO SR

- **Transport infrastructure**

In 2007, the SR transport network included 17 875 km of roads and motorways. Highways represented 365 km of the network. The length of railways was 3 629 km, with 1 578 km of electrified tracks. The length of navigable watercourses remained unchanged at 172 km, with channel length of 38.45 km.

Basic data on the transport infrastructure (km)

Indicators	1993	1996	1999	2001	2002	2003	2004	2005	2006	2007
Length of roads and motorways	17 865	17 867	17 734	17 736	17 750	17 772	17 780	17 803	17 828	17 875
of which motorways	198	215	295	296	302	313	316	328	328	365
Length of railways	3 661	3 673	3 665	3 662	3 657	3 657	3 660	3 658	3 658	3 629
of which electrified lines	1 415	1 516	1 535	1 536	1 556	1 558	1 556	1556	1 577	1 578
Length of navigate inland waterways and watercourses	172	172	172	172	172	172	172	172	172	172
of which watercourses	38.45	38.45	38.45	38.45	38.45	38.45	38.45	38.45	38.45	38,45

Source: SO SR

- **Demand of transport on the utilisation of resources**

Final energy consumption in the transport sector over the period of 14 years has more than doubled itself. Overall consumption of liquid fuels (96 %) represents the greatest share of energy consumption in the transport sector on the overall energy consumption, while the share of solid fuels, gaseous fuels and electricity overall consumption remains small. Road transport shows the greatest share on the overall energy consumption in the transport sector (95 %).

- **Impact of transport on environment**

Over the recent years, important changes in the SR were introduced by a significant increase in the number of motor vehicles. Corresponding changes to the transport situation were dominant mainly in cities and residential zones, where there is an increased load on environment and public health.

- **Emissions from transport**

In terms of transport's share on total emissions of the assessed pollutants for 2005, significant is transport's share on CO emissions – 31 %, 39 % in case of NO_x and 19 % in case of NM VOC.

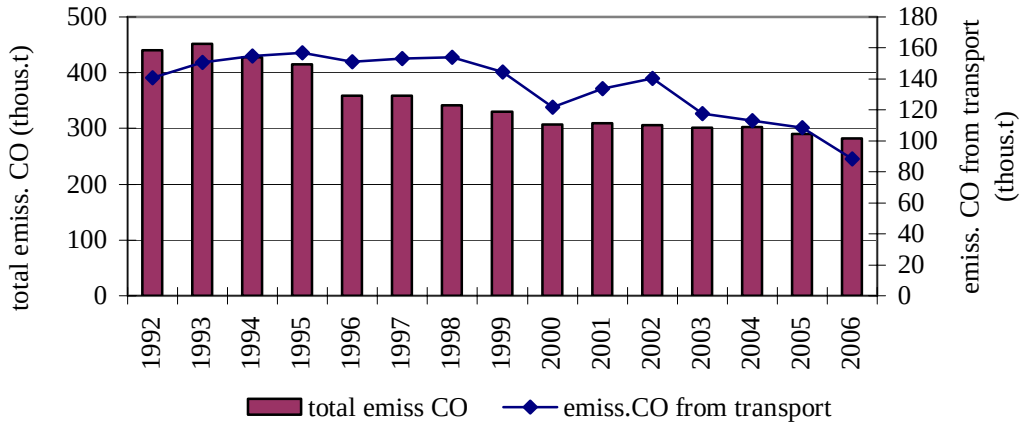
Solid pollutants represented 20 % of all emissions in 2006, while the SO_2 emissions showed 0.2 %.

Transport's share on heavy metal emissions is approximately 2.5 %, with copper showing the greatest share on heavy metal emissions by transport (6.6%) followed by zinc (2.4.%), and lead (2.5 %). Similarly, in case of other heavy metals there was a slight increase in the values of the recorded emissions, compared to the previous year.

Transport's share on total greenhouse gases emissions is approximately 14 %, with the CO_2 share of 17.0 %, and the N_2O share of 5.0 % being among the most dominant.

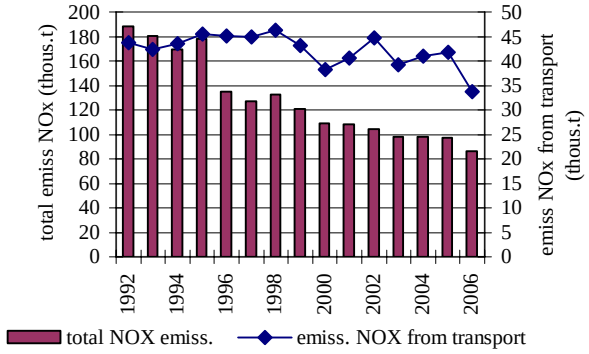
Road transport shows major share on total transport emission production. Share of other types of transport on individual pollutants is very small.

Trend in CO emissions from transport compared to total CO emissions in the SR



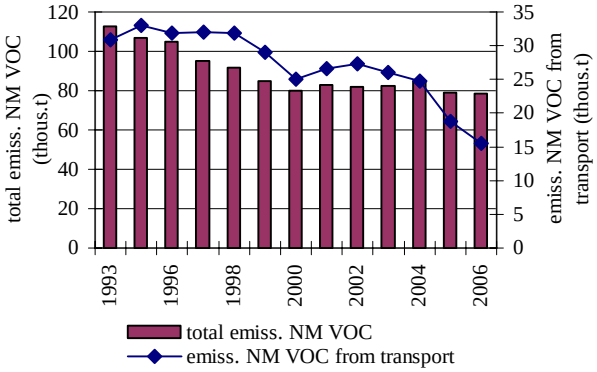
Source: SHMI

Trend in NO_x emissions from transport compared to total NO_x emissions in the SR



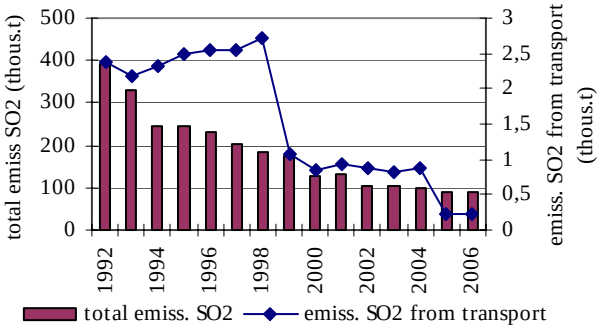
Source: SHMI

Trend in NM VOC emissions from transport compared to total NM VOC emissions in the SR



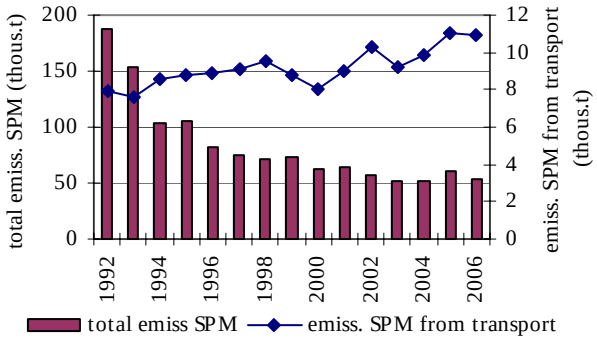
Source: SHMI

Trend in SO_2 emissions from transport compared to total SO_2 emissions in the SR



Source: SHMI

Trend in SPM emissions from transport compared to total SPM emissions in the SR

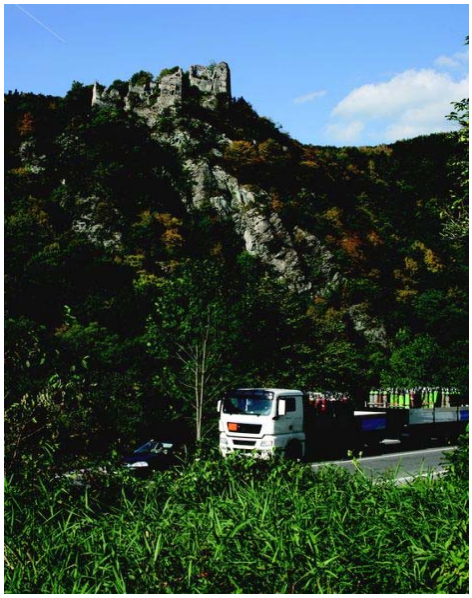


Source: SHMI

- **Waste from transport**

In 2007, there was 137 291.70 tonnes of waste generated in the area of transportation. This included 67 544.56 tons of hazardous waste, and 69 747.14 tons of other waste. Increase in 2006 was

caused by recording about 2 273 000 tons of excavated soil from ground works when building the Sitina tunnels in Bratislava.



- **Traffic accident rate**

In 2007, there is a slight decrease in the number of traffic accidents, compared to the previous year.

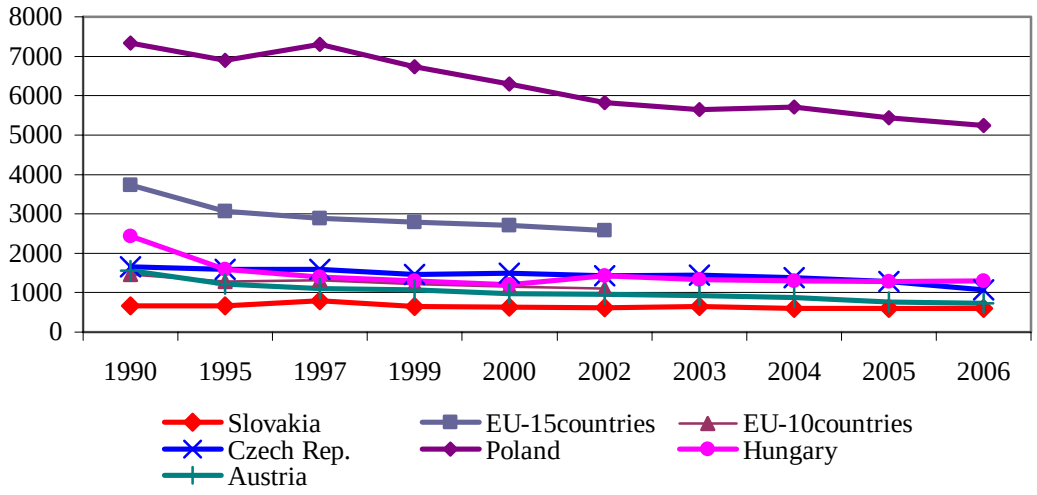
Traffic accidents aftermath analysis still shows a negative trend, with increasing numbers of traffic casualties, heavily injured, and lightly injured. However, over the monitored period of 1993-2007, the number of traffic accidents increased by 20 %.

Trend of traffic accidents in SR

Indicators		1993	1999	2000	2001	2002	2003	2004	2005	2006	2007
Traffic accidents	Number of accidents	50 159	55 683	50 930	57 258	57 060	60 304	61 233	59 991	62 040	61 071
	Killed	584	647	626	614	610	645	603	560	579	627
	Heavily injured	2 736	2 684	2 205	2 367	2 213	2 163	2 157	1 974	2 032	2 036
	Lightly injured	8 682	8 782	7 891	8 472	8 050	9 158	9 033	8 516	8 660	9 274

Source: MoI SR, SO SR

Number of people killed in road accidents – international comparisons



Source: EUROSTAT

Agriculture

♦ Economy of agriculture

Total Slovak economy grew from 2007 faster than agricultural economy, which resulted in reduced share of agriculture on major national economy indicators. **Percentage of agriculture on gross domestic product dropped to 2.5 %.**

♦ Structure of agricultural land

In 2007, **total area of agricultural land** in the SR was 2 428 899 ha. **Loss** of agricultural land including the arable land transfer to forestland, non-agricultural and non-forested land in 2007 was **2 372 ha.** Loss in agricultural land was mostly the result of construction activity (1 398 ha), including the civil and household construction (566 ha), 410 ha of agricultural land was forested. In 2007, there was a reduction in the size of arable soil, fruit orchards, gardens, vineyards and hopp-fields. Only permanent grasslands showed a slight increase (47 ha).

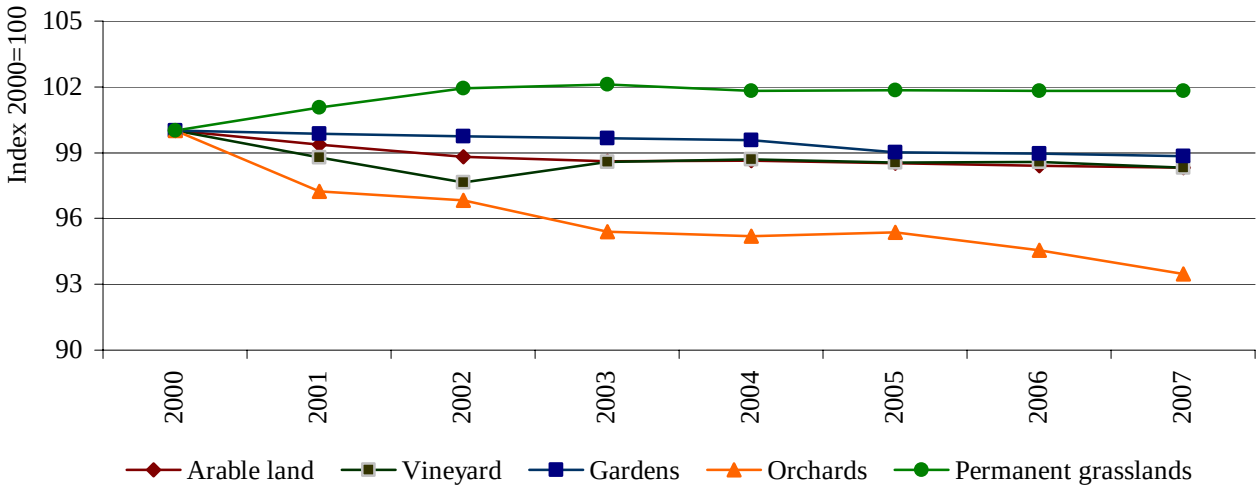
Size of arable land per one inhabitant in 2007 was **0.264 ha.**

Structure of the agricultural land (state to the date 31st December 2007)

Type of land	Area(ha)	Share of agricultural land (%)
Agricultural land total	2 428 899	100.00
Arable land	1 425 896	58.71
Hop-fields	530	0.02
Vineyards	27 243	1.12
Gardens	76 720	3.16
Orchards	17 590	0.72
Permanent grassland	880 920	36.27
Total area of SR	4 903 573	-

Source: GCCA SR

Agricultural land fund structure after the year 2000

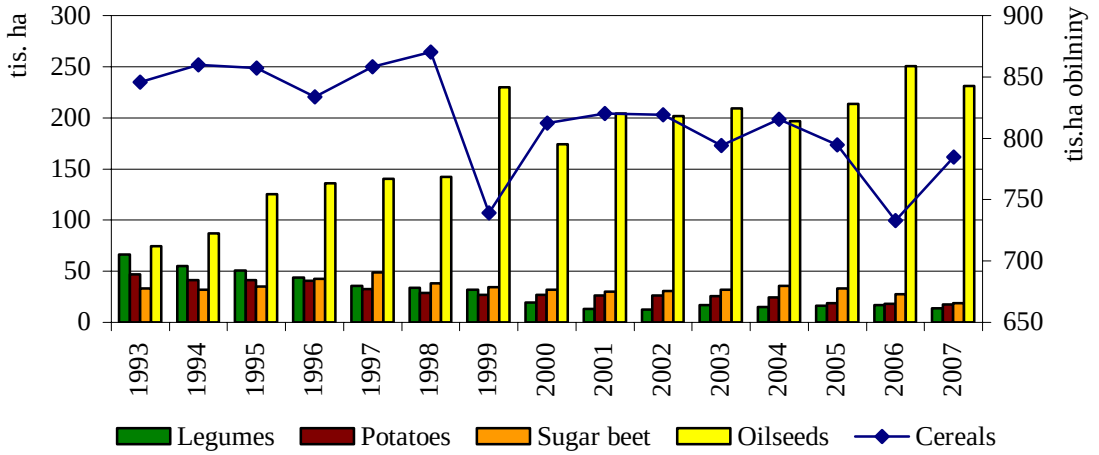


Source: GCCA SR

Plant production

In 2007, harvest areas in most agricultural crops **decreased from the previous year,** especially in sugar beet, legumes, oilseeds and potatoes. The year-to-year increase was in harvest areas of cereals.

Harvested areas of agricultural crops



Source: SO SR

Compared to 2006, **genetic diversity** (representated varieties of agricultural crop cultivated in the SR) in 2007 shows **an increase** in all mentioned crop categories, with the exception of fodder beet.

Number of agriculture plant's varieties in the SR

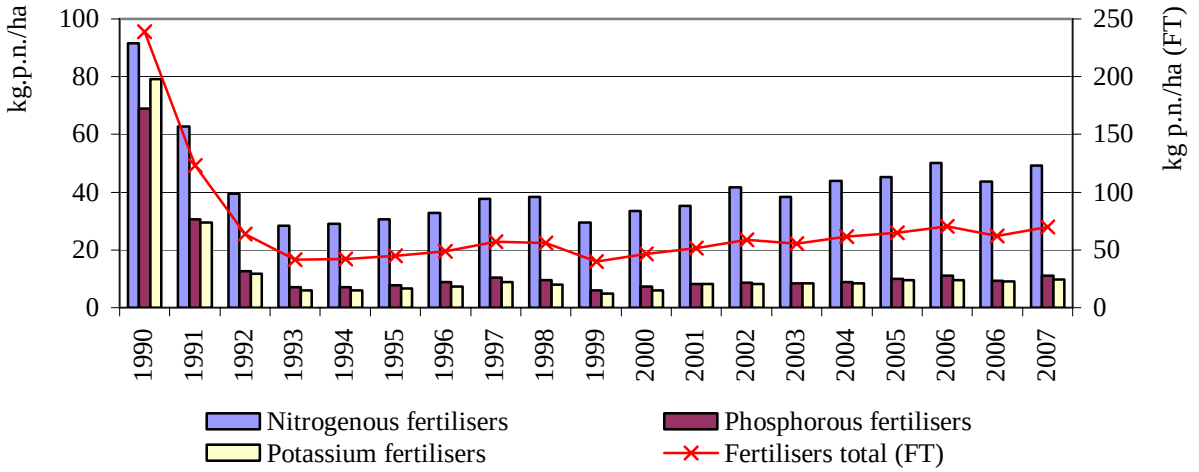
Agricultural plant	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Winter wheat	22	23	22	23	24	25	28	28	34	37	41	45	57	75	83
Winter barley	10	10	11	8	9	10	11	11	13	14	11	14	14	20	21
Spring barley	26	25	26	27	24	22	23	24	21	24	28	29	30	36	41
Potatoes	44	48	60	72	70	67	69	75	78	81	90	103	101	109	112
Rapeseed	7	10	14	12	12	9	14	16	19	22	25	32	29	35	41
Sugar beet	28	37	40	52	58	61	63	52	53	42	42	38	41	47	56
Fodder beet	12	16	16	13	12	6	8	8	8	8	7	6	6	6	6

Source: RIPP

Fertiliser consumption

In 2007, consumption of **fertilisers** was 70.1 kg of pure nutrients per hectare of agricultural land.

Fertilisers consumption in Slovakia (kg pure nutrient/ha)

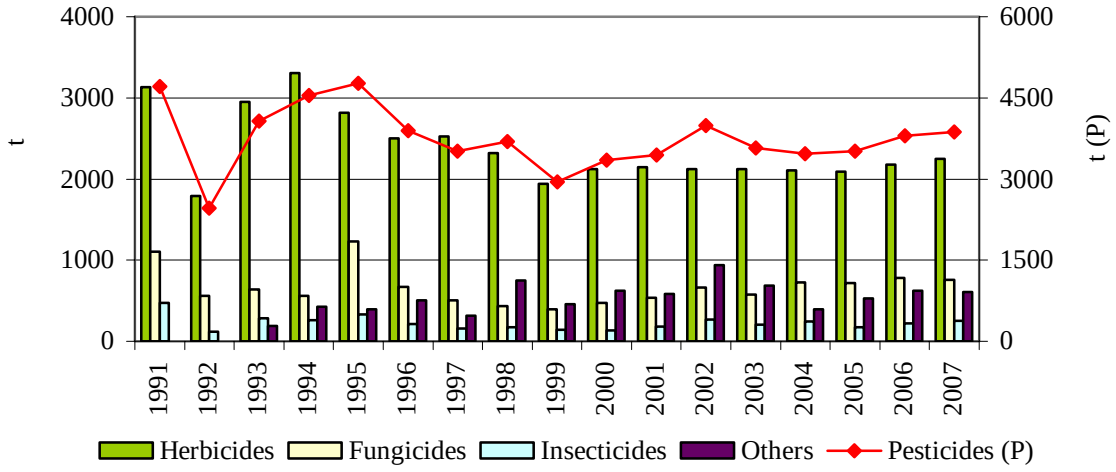


Source: CCTIA

Pesticides consumption

Compared to 2006, total consumption of pesticides in 2007 increased by 1.6 %. Altogether, 3 867 t of pesticides were applied, including 2 246 t of herbicides, 757 t of fungicides, 254 t of insecticides, and 610 t of other pesticides.

Pesticides consumption in Slovakia (t)

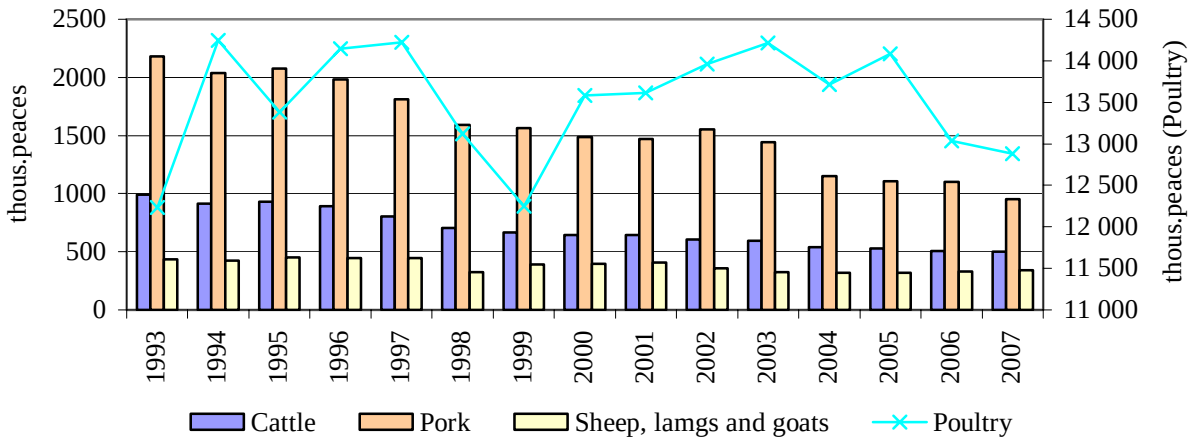


Source: CCTIA

Animal production

In 2007, numbers of major livestock categories again dropped, i.e. cattle, pork, poultry, with the exception of the sheep, lambs and goats, which showed a positive growth in numbers.

Number of livestock in Slovakia (thousand peaces)



Source: SO SR, MoA SR

Genetic diversity expressed by number of livestock in the SR decreased from the previous year in cases of cattle, pork and sheep.

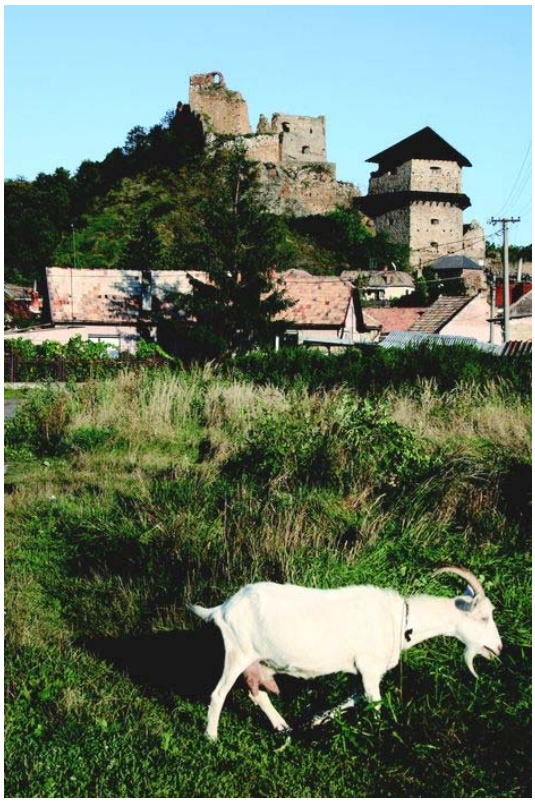
Number of livestock breed in the SR

Breed	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2005
Cattle	5	5	5	5	6	6	11	11	11	11	11	11	12	11	8
Pork	15	15	15	15	15	15	16	15	13	11	11	11	11	8	5
Sheep	8	9	10	9	9	12	12	13	12	12	13	13	13	13	7
Goats	2	2	2	2	2	2	2	2	2	2	2	2	3	2	4

Source: RIAP

Melioration

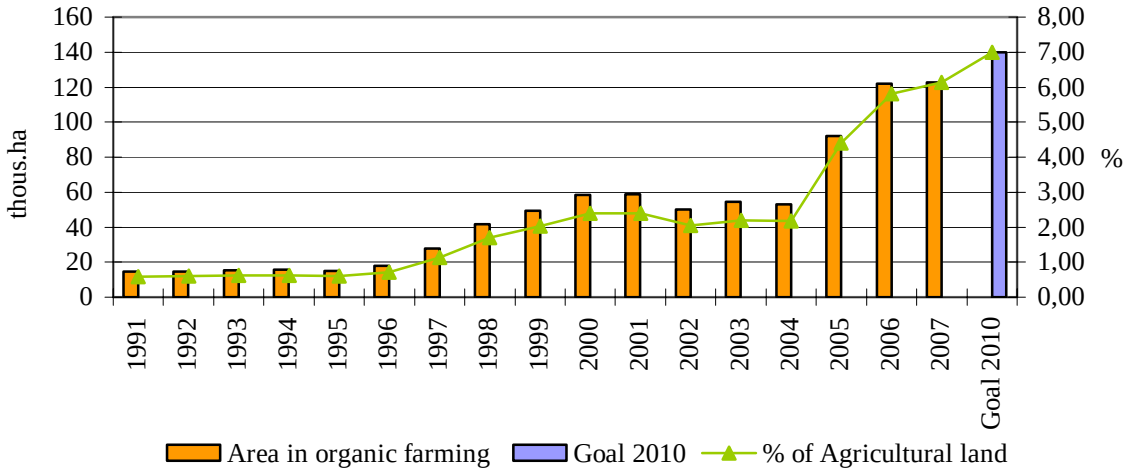
After 2000, there was a falling trend in the size of irrigated territories, analogous as utilisation of water for irrigation purposes with certain fluctuations. In 2006, there was 25 325 ha of irrigated agricultural land.



Organic farming

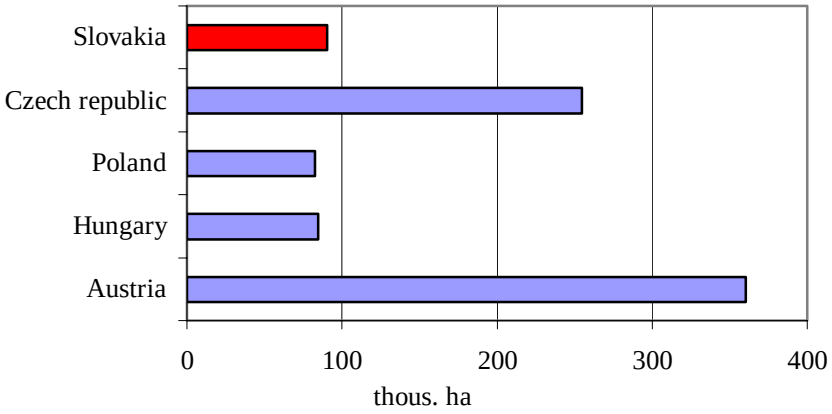
In 2007, the system of organic farming in the SR included 278 subjects farming on 122 589 ha of agricultural land, which is 6.14 % of total agricultural land. The goal is to implement organic farming practices on 7 % of total agricultural land by 2010.

Trend in the organic farming area



Source: CCTIA

Organic farming area in 2005 – international comparision



Source: EUROSTAT

Agriculture demands in exploitation of resources

Since 2002, there has been a continuation **decrease in the consumption of solid fuel.** Since 2003, there is a falling trend in the consumption of gas fuels, heat, and electricity. Consumption of liquid fuel decreased from the previous year, as well.

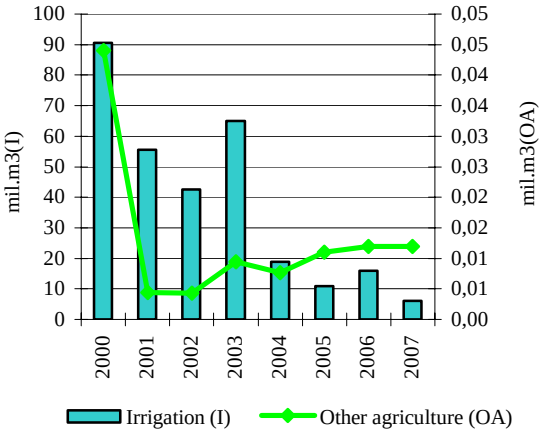
Consumption of selected fuel types, heat, and electricity in agriculture (TJ)

Kind of fuel	2002	2003	2004	2005	2006
Solid fuel	133	131	82	65	55
Liquid fuel	2 665	2 987	3 250	3 417	3 000
Gas fuel	1 869	3 261	1 781	1 670	1 263
Heat	270	300	181	179	168
Electricity	1 850	3 294	1 530	1 411	1 325

Source: SO SR

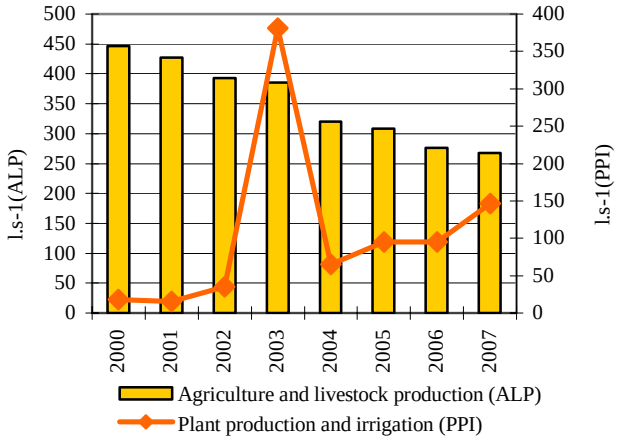
Compared to 2006, in 2007, there was a decrease in surface water volumes used in agriculture for irrigation purposes. On the other hand, volumes of groundwater used in agriculture for plant production and irrigation purposes increased. Slight decrease was in ground water volumes used in agriculture and livestock production.

Trend in surface water use in agriculture



Source: SHMI

Trend in groundwater use in agriculture



Source: SHMI

Production of renewable energy from agriculture

Presently, agricultural land is used for cultivation of bio-energy produce designated for bio fuel production. Biomass category used to produce liquid bio fuels contains mainly oilseeds and grains that yield vegetable oils, their derivatives (i.e. methyl esters of vegetable oils, mainly MERO rape seed oil) and alcohols (ethanol, methanol and their derivatives – methyl-t-butyleter (MTBE), ethyl-t-butyleter ETBE). Biomass used to produce gaseous products includes green hydrocarbon forage and farm animals excrements.

Despite its relatively high potential in Slovakia, use of the biomass for energy purposes is not satisfactory from the perspective of including energy-yielding produce into sowing technologies, as well as production of energy from biogas. Technological equipment is lacking in the area of implementation. In 2007, there were 4 biogas production facilities in operation in Slovakia. Biogas was produced from cattle manure at the volume of the 576 thous.m^3.

Total annual production of agricultural biomass suitable for heat production in Slovakia

Crop type	Area (ha)		Yield of biomass (t/ha)		Production of biomass (t/year)	
	2006	2007	2006	2007	2006	2007
Thick-sown cereals - total	565 665.38	612 136.70	3.27	3.13	739 890.30	766 395.20
Maize	151 005.65	157 255.60	7.77	5.56	1 173 308.80	874 341.14
Sunflower	108 816.00	64 746.20	4.62	4.44	502 729.90	287 473.13
Rapeseed	122 511.38	153 830.50	4.24	4.18	519 446.60	643 011.50
Orchards	7 684.29	7 329.70	3.50	3.50	26 894.00	25 654.00
Vineyards	16 262.09	15 902.00	1.50	1.50	24 393.00	23 853.00
Flight from permanent grasslands	82 000.00	74 476.60	2.00	2.00	164 000.00	148 953.20
Total	**1 053 944.80**	**1 085 677.30**	-	-	**3150662.60**	**2 769 681.17**

Source: RIPP

Note: In calculating biomass for densely-sown grains we considered average yealds of cereals in the corresponding year in Slovakia and ratio of grain and straw to total biological yeald (ratio of grain and straw was 1 : 0.9).
To produce heat, it is possible to use approximately 40 % of straw from densely-sown cereals. About 60 % of produced straw is added to forage rations for livestock, part of it is used for bedding, and another part is used to balance C in soil. For this reason the table shows only the value of usable straw production potential to produce heat. For maize, the calculated grain – to – corncomb ratio is 1 : 1.4, for sunflower it is 1 : 2.2, for rape seed it is 1 : 2.

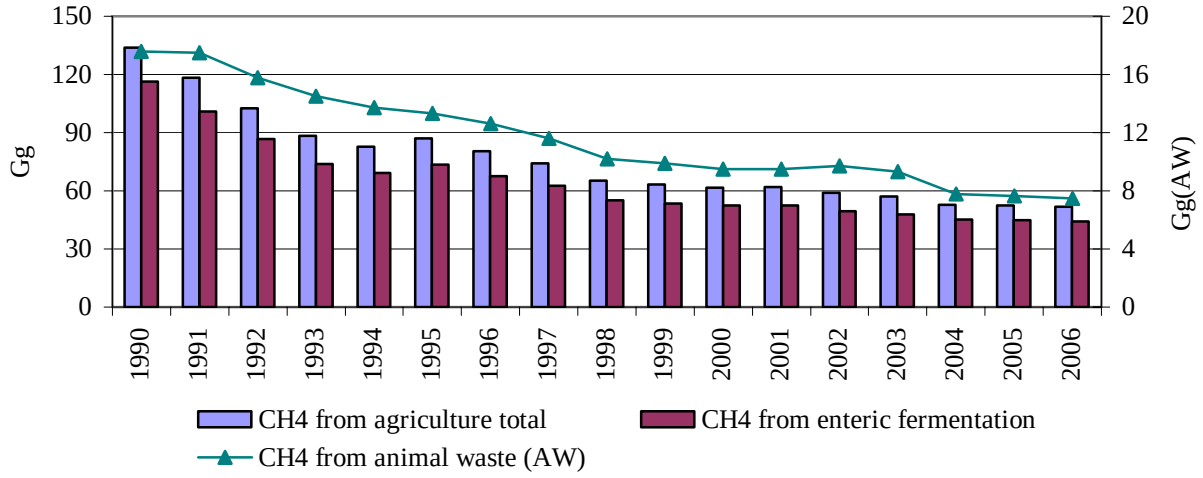
Impact of agriculture on environment

Agriculture is one the important environmental polluters. It mostly contributes to green house gases emissions, production of waste, discharge of waste water, and other.

Impact of agriculture on air and global climate

Share of agriculture on total methane production is systematically falling, due to decreased number of livestock. In 2006, agriculture produced 51.7 thous. tons of methane.

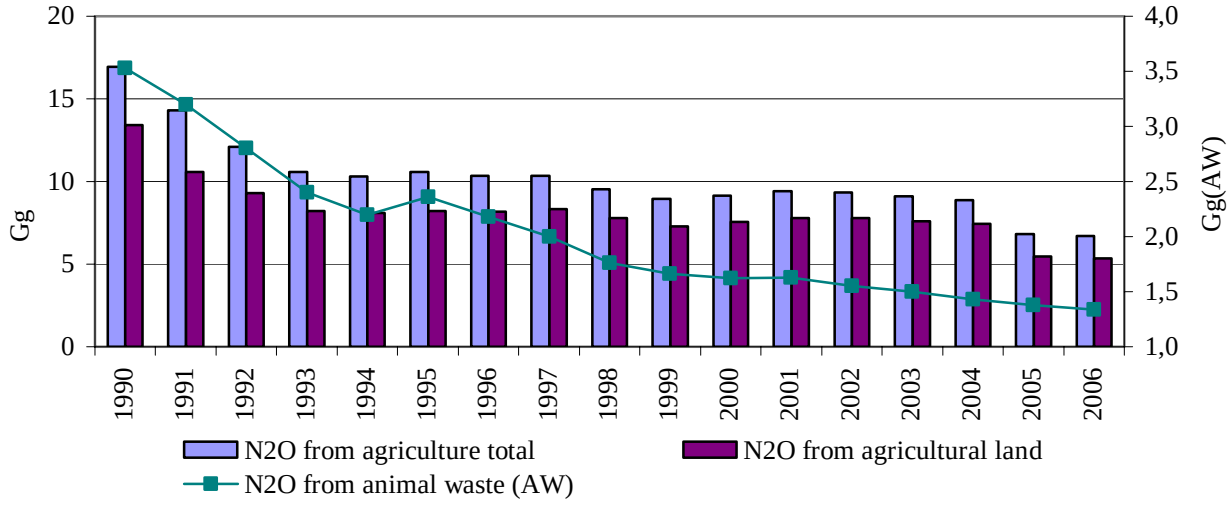
Trend in methane emissions from agriculture according to type of activity



Source SHMI

Production of nitrous oxide from agriculture is rapidly decreasing, due to a significant reduction in the use of fertilisers. In 2006, agriculture produced 6.7 thous. tons of nitrogen monoxide.

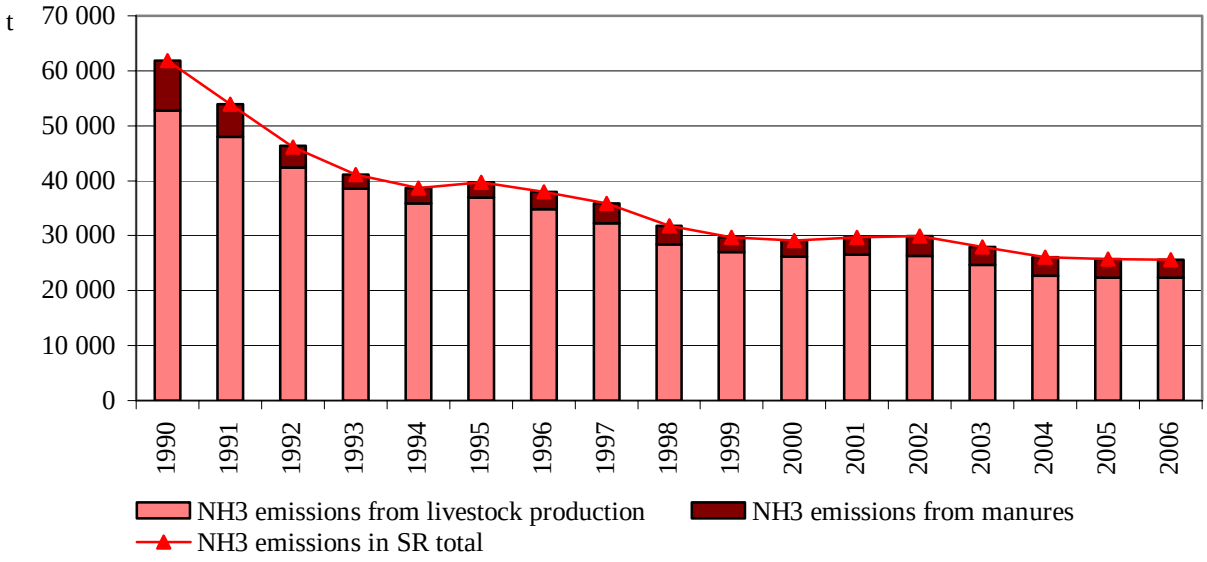
Trend in nitrogen monoxide emissions from agriculture according to type of activity



Source SHMI

Agriculture is the biggest producer of ammonia (NH_3). NH_3 emissions showed a falling tendency since 1990. Reduction in emissions from livestock production relates to a decreased rate of livestock raising.

Trend in ammonia emissions from agriculture



Source: SHMI

Impact of agriculture on water quality and quantity

In 2007, there was 274 984 m^3 of discharged wastewater related with agricultural activities.

Discharged amount of waste water in SR related to agriculture in 2007

Waste water from agriculture	Volume ($m^3.yr^{-1}$)	Insoluble compounds ($t.year^{-1}$)	BOD_5 ($t.year^{-1}$)	COD_{Cr} ($t.year^{-1}$)	ENP ($t.year^{-1}$)
Treated	107.254	7.202	7.754	23.793	0.001
Untreated	167.730	0.000	0.000	0.000	0.000
Total	274.984	7.202	7.754	23.793	0.001

Source: SHMI

Production of waste in agriculture

In 2007, there were 649 497.45 tons of total waste produced in agriculture, which is 91 947 tons less than in 2006. Of total produced waste other waste was 636 861.80 tons, which is 78 635.06 tons less than in 2006. Produced hazardous waste in 2007 was 12 635.65 tons of total waste volumes, which is 13 311.7 tons less than in 2006.

Forestry

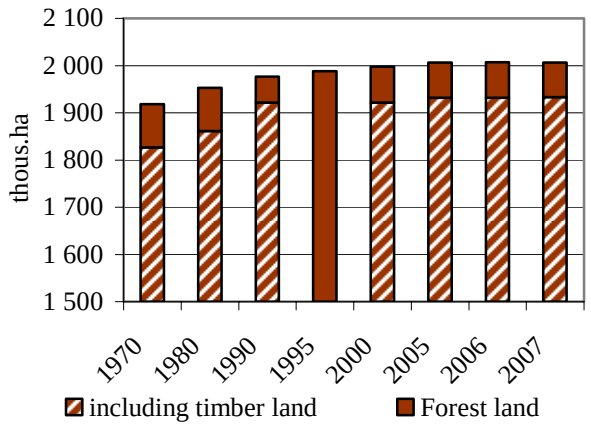
♦ Share of forestry on GDP production

GDP value for forest management in 2007 in current prices was higher only slightly (by 0.18 % or 8.5 bill. SKK) compared to the previous year, which caused reduction in the share of forest management on Slovakia GDP by 0.06 % down to 0.46 % (volume of wood production and sale was similar to 2006 with monetary value for wood increasing by 8 %).

♦ Structure of forest land

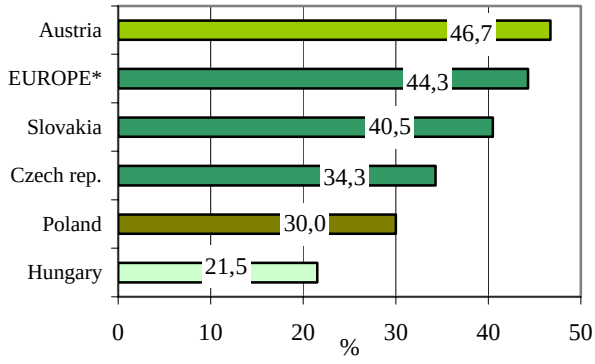
Slovak Republic belongs to the countries with the highest rate of **forestation**. **Forest land** in Slovakia in 2007 was about **40.9 %** (2 006 601 ha) of total area of the state - there has been a long-term, continuous increase in their size. Timber land in 2007 represented app. 96.3 % (1 932 942 ha) of total size of forest land and similarly, there has been a gradual increase in its size. Calculated to the number of inhabitants, this represents **3.72 km^2 per 1 000 inhabitants.** Since 1950, size of forest land grew by 13.3 %, while the greatest increase in size was recorded between 1960-1970.

Trend in forest land and timber land



Source: NFC

Comparison of forestation in selected countries

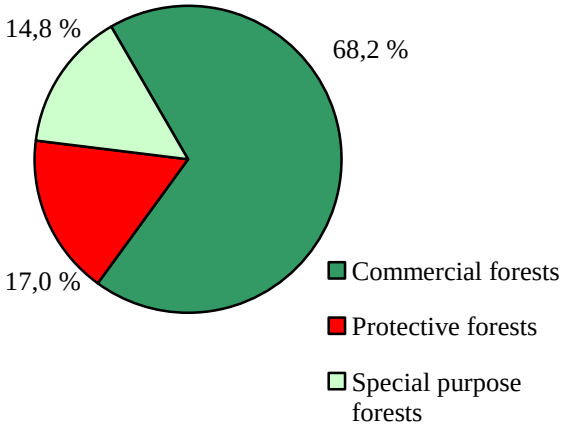


* – including Russian Federation;
Source: Global Forest Resources Assessment 2005, FAO

The forest ownership and utilisation settling process governed by the restitution legislation has not yet finished. This causes permanent changes to forest structure by ownership and utilization. **State** organisations of forest management **administer 55.5 % of forests,** which is 14.1 % more than in the state ownership. Forest land with no fully identified or documented ownership claims, or with no claims yet received from the entitled persons, take up **5.6 %** of total SR forest land.

Due to the increased demand for public benefit functions of forests, there was a gradual increase in the size of protection forests (from 7.9 % in 1960 to the present level of 17 %, the size is stabilized since recent years) and also forests for unique purposes (forests affected with pollution were removed from this category, which caused reduced size of these forests). Majority of production forests belong to poly-functional forests that also have other associated ecological and social functions, while only 6.7 % of forests are located in purely production type.

Spatial representation of forest categories in 2007



Source: NFC

Overview of area according to function – protective forests (PF) and special purpose forests (SPF) (2007)

Function - PF	**% of PF**
Erosion control	75.6
Water management	22.2
Deflation control	0.7
Avalanche control	1.5
Bank protective	0.2
Function - SPF	**% of SPF**
Water protective	4.5
Recreational	9.7
Health resort-therapeutic	1.2
Nature protection	12.7
Air pollutants control	37.0
Game management	6.8
Education-research	28.0

Source: NFC

♦ **Forest composition by species and age groups**

In terms of **forest composition by species**, there is a positive share of broad-leaved trees (59.5 %) compared to coniferous trees (40.5 %). There are **introduced tree types** commonly growing within broad-leaved tree vegetation areas. Their area has not increased over the recent decades (3.08 %), with the exception of *Robinia pseudoacacia*, that grows on non-green lands.

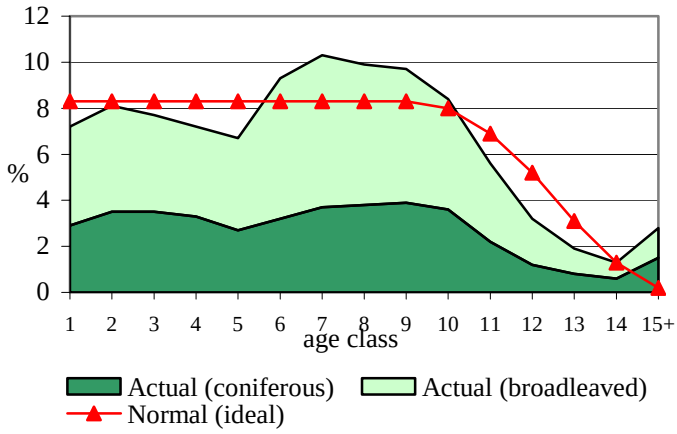
Real **forest age composition** of SR partially differs from the normal (theoretical) one. There are 538 528 ha of forests located in the 1-4 age category, 885 755 ha are located in the 5-9 age category, and 452 119 ha are located in the 10 and more age category, with clearings taking up the area of 11 640 ha.

Comparison of present tree species composition in the forest of the SR with original and target-perspective one

Tree species	**Tree species composition (%)**		
	Original	**Target - perspective**	**Actual (2007)**
Spurce / Fir	4.9 / 14.1	18.2 / 6.7	25.9/4.0
Pine / Larch	0.7 / 0.1	4.2 / 6.7	7.1/2.4
Other coniferous	0.9	1.2	1.1
Coniferous together	**20.7**	**37.0**	**40.5**
Oak	19.9	17.7	13.4
Beech / Hornbeam	48.0 / 2.6	35.9 / 0.9	31.2/5.8
Maple /Ash	3.2 / 0.4	3.0 / 0.5	2.0/1.4
Robinia / Birch	- / 0.1	0.1 / 0.2	1.7/1.4
Elm / Alder	0.9 / 0.3	1.2 / 0.3	/0.8
Poplar / Willow	0.1 / 0.1	0.2 / 0.1	0.4/0.4
Other broadleaved	3.7	2.9	0.5
Broadleaved together	**79.3**	**63.0**	**59.5**

Source: NFC

Age composition of the forest in 2007



Source: NFC

♦ **Forest transport network**

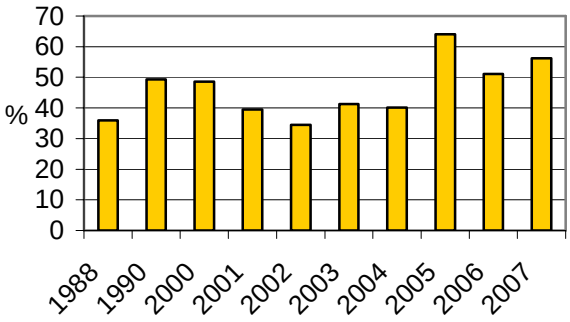
Average density of forest road network in Slovakia is 18.6 $m.ha^{-1}$, while the optimum density in our conditions fluctuates between 20 to 25 $m.ha^{-1}$. Length of outgoing forest roads in 2007 was **37 106 km**.

♦ **Forestation and standing volume**

In 2007, **13 698 ha were forested**, including 4 671 ha forested through **natural regeneration.** Share of natural regeneration has almost doubled since 1990 (currently, it represents 34.1 % of total forestation) and helps to enforce sustainable development practices in forests.

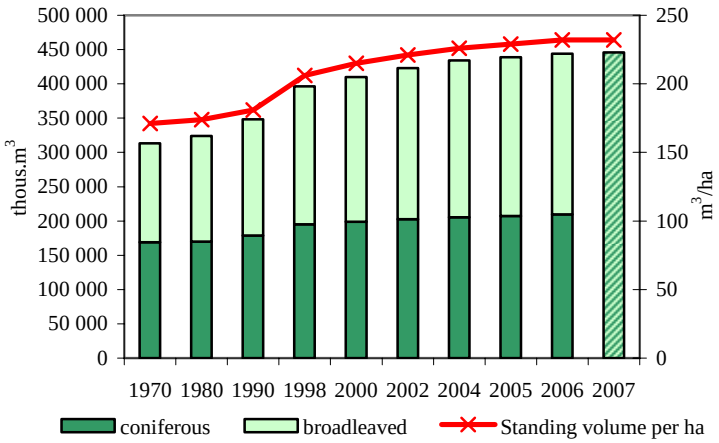
Standing volume in 2007 reached **445.8 mil. m^3** of barkless wood matter, with average stock per hectare reaching 232 m^3. Still increasing volume of wood stock is mainly influenced by the existing age composition of the Slovak forests, with abnormally high share of most-incremental medium age levels. **Total current increment** decreased since 1990 (through changes to the age composition) and is 11 665 thous. m^3. This trend may be considered linear since 2000.

Trend in share of incidental felling on total volume of timber felling in SR



Source: NFC

Trends in total standing volume



Source: NFC

♦ **Timber felling**

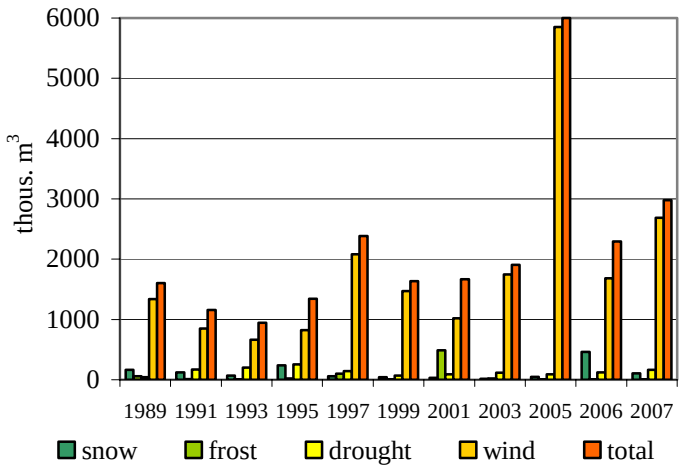
Timber felling in the Slovak forests shows an increasing tendency over a long range. In 2007, it was **8 367.1 thous. m^3**, including 5 344.2 thous. m^3 of coniferous timber. Since 1990, it has grown by 63 %. **Incidental felling** included **56.2 %** of total anticipated harvested timber (including 79.9 % of harvested coniferous trees), which significantly contributed to exceeding the anticipated harvested volumes.

Natural conditions in the SR forests allow implementing the shelter wood system on about 60 % of timber land, selection harvest on about 10 %, and clear cutting on the remaining 30 % of timber land. **Intensity of forest resources utilisation** was as much as 71.7 % this year; however, it still points to the sustainable use of the SR forests (timber felling is lower than the annual increment).

♦ **Injurious agents and forests condition**

As a consequence of negative impacts of wind, snow, frost, drought, and unknown **abiotic factors,** there was **2 186.8 thous. m^3** of wood matter **processed** this year, with more than 88 % caused by the wind.

Trend in damages caused by abiotic agents



Source: NFC

Damages caused by abiotic agents in 2007 (m^3)

Injurious agent	Affected	Processed
Wind	2 686 833	1 943 505
Snow	108 429	92 973
Frost	4 088	4 084
Drought	165 152	131 567
Underflooding	406	406
Other abiotic agents	16 491	14 252
Total	**2 981 399**	**2 186 787**

Source: NFC

Hurricane Kyrill substantially damaged middle-European forests at the beginning of 2007. Total volume of wind clearings in Europe represented approximately 55 mill.m^3, while Slovak forests were affected in a lesser degree (app. 400 thous.m^3). Incidental felling by wind was realized due to newly-created clearings, especially due to a storm of August 23, 2007.

Size of individual zones with pollution risk is **1 185 845.7 ha** of forests, while forests damaged by pollution take up **20 435 ha** forests (including over 69 % of coniferous). Spruce trees take up 52.7 %, while beech trees take up 23.5 %. Majority of pollution is of trans-boundary nature – coming from industrial areas of the neighbouring countries.

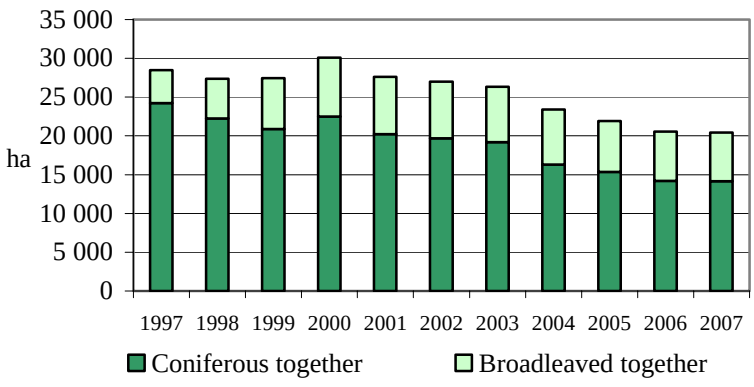
In 2007, Slovakia registered **463 forest fires** on the size of **679 ha,** causing **158 mill. SKK** in damages. Most frequent causes included burning of grass (122), setting fires in open nature (104), and manipulation with open fire (65).

Forest damage caused by anthropogenic injurious agents in 2007 (m^3)

Agents	Affected	Processed
Immisions	200 021	169 547
Fires	7 654	3 250
Wood stealing	8 032	8 032
Total	215 707	180 829

Source: NFC

Trend of the air pollution forest damage



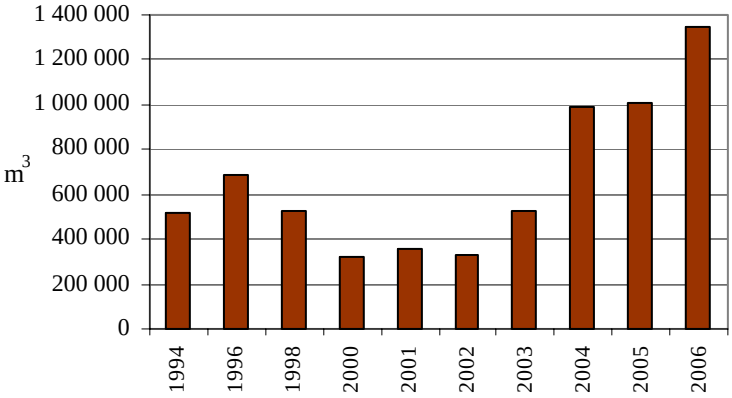
Source: SO SR

In 2007, the greatest invasion of vegetation by **bark beetles and woodworms** was recorded (as much as 2 506.8 thous. m^3) with 2 024.6 thous. m^3 processed. *Ips typographus* is the major harmful insect, attacking 2 325.8 thous. m^3 of wood matter. In general, situation in damaged vegetation by bark-beetles and woodworms is considered very negative. **Leave-eating and sucking** insects show a permanently high occurrence of lice on young larch trees and spruce trees (*Adelges laricis* and *Sacchiphantes viridis*). *Cameraria ohridella* attacked virtually all horse chestnut trees in Slovakia.

Armillaria ostoyae, that is becoming a major harmful agent of **phyto-pathogenic micro-organisms**, contributed to decomposition of spruce trees on acidic substrates in Kysuce, Orava, the sub-Tatras regions, and in Spiš. From the economy aspect, **wood-eating fungi** cause major damage (especially root and trunk rottenness). Spruce belongs to the most affected tree type, followed by fir, beech and pine.

Total recorded damage caused by **game** was 6 150 thous. SKK. Since 1991, (24 501 thous. SKK) they have had a falling tendency. Risks of forest vegetation damaged by game are increasing.

Trend of damages caused by bark beetles and wood borers



Source: NFC

♦ **Forest condition monitoring and assessment**

National programme of **forest ecosystems health condition monitoring** was implemented also in 2007. The programme operated 112 permanent monitoring areas (PMA) within the 16x16 km network (extensive monitoring), and 7 research PMAs (intensive monitoring). Both monitoring levels are part of the European network of monitoring areas within the UN/ECE ICP Forest Programme.

Ratio of trees **in the 2-4 degrees of damage** is the determining factor for assessment of deterioration or improvement to the health condition of forests. The year 1989 is considered most critical, when as much as 49 % of trees were classified into degrees of damage 2-4. We can say that health status of the SR forests has improved over the last years, or it has been stabilised, respectively, and fluctuations in individual years are caused mainly by climate factors.

Results of forest condition monitoring in SR in 1987-2007

Year	Tree types	Representation of trees in various damage degrees in %							
		0	1	2	3	4	1-4	2-4	3-4
1987	Coniferous	11	36	41	11	1	89	53	12
	Broadleaves	26	47	22	5	0	74	27	5
	Total	19	42	32	7	0	81	39	7
1997	Coniferous	13	45	38	3	1	87	42	4
	Broadleaves	22	55	21	2	0	78	23	2
	Total	18	51	28	2	1	82	31	3
1999	Coniferous	15	45	36	3	1	85	40	4
	Broadleaves	22	59	18	1	0	78	19	1
	Total	19	53	26	1	1	81	28	2
2001	Coniferous	12	49	37	1	1	88	39	2
	Broadleaves	18	55	26	1	0	82	27	1
	Total	16	53	30	1	0	84	31	1
2003	Coniferous	4	56	39	1	0	96	40	1
	Broadleaves	14	61	24	1	0	86	25	1
	Total	10	59	30	1	0	90	31	1
2005	Coniferous	6	59	33	2	0	94	35	2
	Broadleaves	21	65	13	1	0	79	14	1
	Total	14	63	22	1	0	86	23	1
2006	Coniferous	5	53	41	1	0	95	42	1
	Broadleaves	21	62	16	1	0	79	17	1
	Total	14	58	27	1	0	86	28	1
2007	Coniferous	5	58	36.1	1.1	0.3	95.3	37.5	1.4
	Broadleaves	19	65	14.9	1.7	0.0	81.5	16.6	1.7
	Total	13	61,8	24.0	1.5	0.1	87.4	25.6	1.6

Description of damage degrees of monitored trees: Source: NFC

0 - defoliation of trees between 0 - 10 % no defoliation (healthy trees)
1 - defoliation of trees between 11 - 25 % slight defoliation (slightly injured trees)
2 - defoliation of trees between 26 - 60 % medium defoliation (medium injured trees)
3 - defoliation of trees between 61 - 99 % strong defoliation (strongly injured trees)
4 - defoliation of trees between 100 % dying and dead

Major knowledges reached in 2006:

- Of total number of 4 023 monitored trees in 2007, 25.6 % were damaged, i.e. with defoliation exceeding 25 % (degrees of defoliation 2-4).
- A worse situation exists with the coniferous trees, with 37.5 % of damage trees, while only 16.6 % of the broad-leaf trees are damaged.
- Average defoliation of all tree types together in 2007 is 23.2 %, including 26.4 % of coniferous, and 20.8 % of broad-leaf.
- On the basis of the number of trees classified into the damage degrees of 2-4, health condition is worse than the whole-European average, caused mainly by worse health condition of coniferous trees.
- The least-defoliated tree types are hornbeam and beech. In long term, tree types with the greatest level of defoliation are fir and spruce.
- Orava, Kysuce, and Spiš-Tatras area belong to the areas with the worst long-term health condition of forest, partially also the Acacia vegetation of the south of Slovakia.
- As much as 86.7 % of the monitored trees showed at least one sign of damage by harmful agents. Only 13.2 % of trees showed no signs of damage.
- Assessment of atmospheric deposition of the areas of intensive monitoring showed reduced sulphur deposition in the Slovak forests in 2006 by 40-50 %, when compared to 2001.

- Total nitrogen deposition was higher than sulphur deposition at all monitored areas, both in open area, as well as in forestland. The trend started last year only proves that the acidification and eutrophication impacts of nitrogen gradually play a key role in relation to the health condition of forest vegetation.
- Ozone concentrations in the monirored territories in 2006 showed a typical annual trend, while the critical AOT 40 index level (set at 10 000 ppb.h for forest ecosystems) was exceeded in all monitored territories. The mentioned value was regularly exceeded in higher altitudes as early as in the first half of the vegetation season.
- Due to a very dry Spring of 2007 in lowlands, there was a shortage of water stores in soil. This resulted in a stopped lateral growth of beech trees.

Results of tree defoliation in selected European countries in 2006

Country	Number of assessed trees	Degree of injury				
		0	1	2	3+4	2+3+4
Czech Republic	5 661	12.3	31.5	54.5	1.7	56.2
Hungary	28 386	41.3	39.5	13.9	5.3	19.2
Poland	7 520	27.0	52.9	19.6	0.5	20.1
Austria	3 425	57.8	27.2	10.7	4.3	15.0
Slovakia	**3 975**	**13.9**	**58.0**	**27.0**	**1.1**	**28.1**

Source: NFC

♦ **Hunting**

There were **1 826 hunting areas** in Slovakia in 2007, including 28 game protection territories and 10 pheasant territories. Total size of the hunting territory is **4 459 thous. ha**. There is 2 334 thous. ha of agricultural land, 1 996 thous. ha of forest land, 51 thous. ha of aquatic, and 78 thous. ha of other land. Number of hunting areas is increasing, while their average size is decreasing.

Spring stocks of the cloven-hoofed game excluding the boar game as of March 31, 2007 were higher than in the previous year.

Shooting of clove-hoofed game in 2007 was higher than in the previous year, however, it should even be higher (the shooting plan was not met).

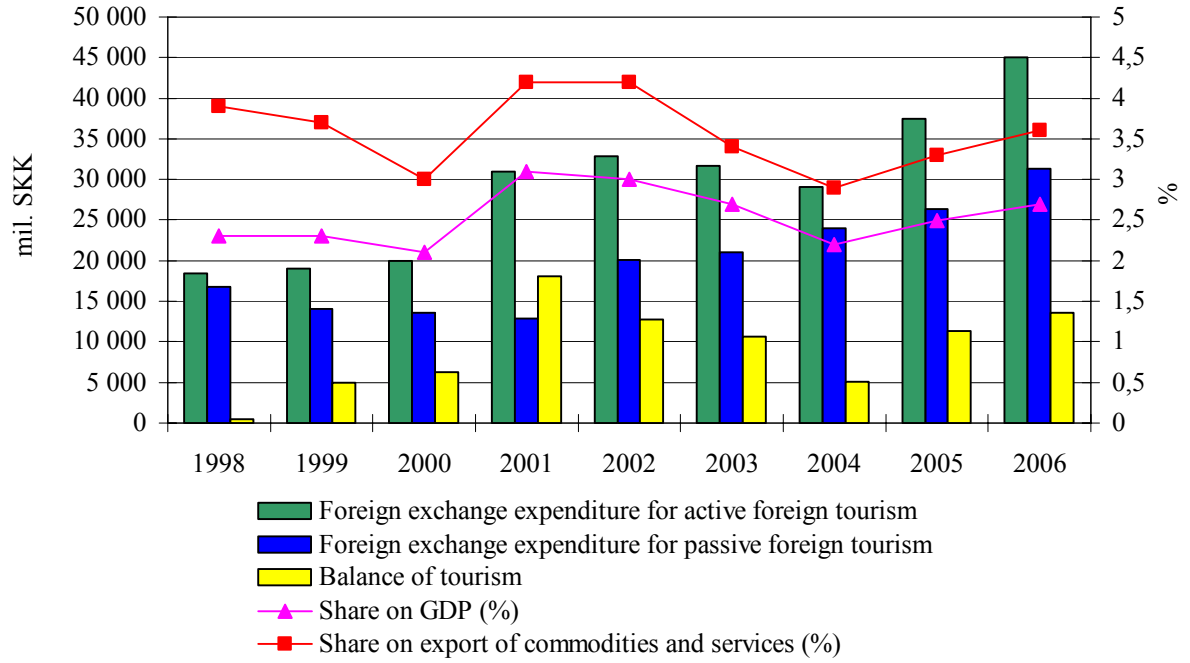
Spring stock of rabbit and turkey increased. On the other hand, spring stock of pheasant, brown hare and partridge dropped. Numbers of **large predators** increased statistically. In terms of other **rare species** of animals, compared to the previous year, their numbers increased, excluding wood grouse and hazel hen. Hunting of rare game species is strictly regulated. Permitted shooting limit of **bear** was 68, while the actual number of shot animals was only 25. 123 wolves and 8 alpine chamois were shot. Number of chamois decreased (from 665 in the last year to the present 645).

Recreation and tourism

♦ Tourism and its contribution to the GDP

Notwithstanding their fluctuating characteristics, **foreign exchange revenues for active tourism balance (AZCR) in 1997-2002 were on the rise**; however, during the **period of 2002-2004, there was a reduction,** caused by major changes outside the sector (strengthening of the Slovak currency conversion rate, especially relating to the US dollar and Polish zloty, increased original VAT tax rate from 14 to 19 %). **There was again a very significant increase in revenues from tourism and their share on the GDP and export of commodities and services in 2005-2007**.

Tourism and its share on GDP and export between 1998-2007



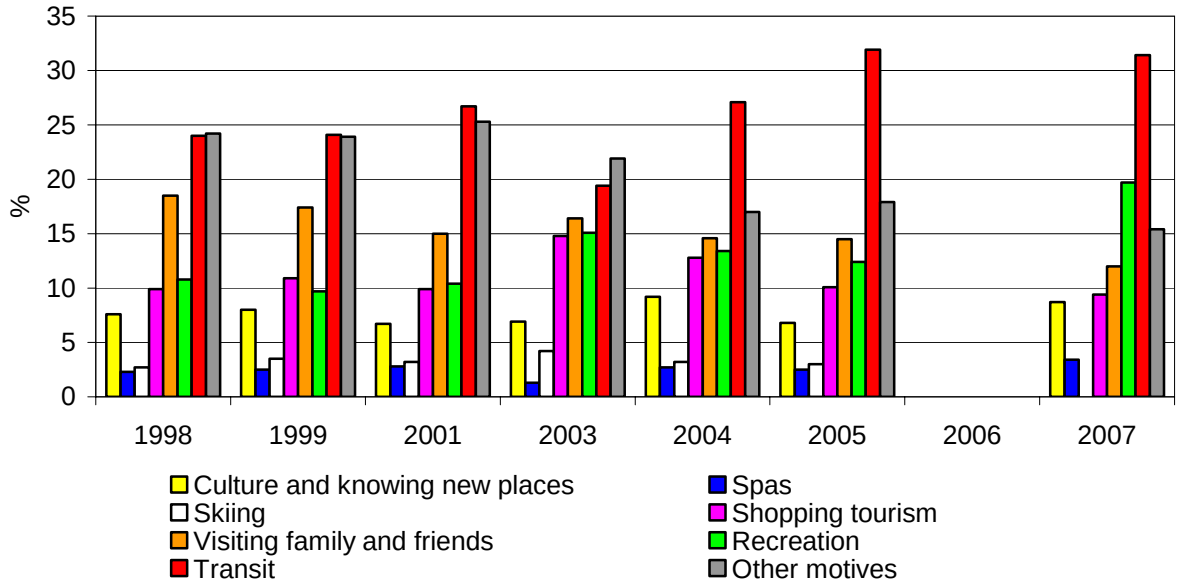
Source: SO SR

* level of revenues in foreign exchange in 2001 is partially affected by transition to EUR toward the end of the year and the SR citizens placing foreign exchange on their foreign exchange accounts

♦ Specific analysis of recreation and tourism

Dominant motives of the international tourists to Slovakia include activities in accordance with the requirements of sustainable development; however, high and significantly rising numbers (especially in the years 2003-2005) of transit tourists is a major challenge. Number of transit tourists slightly decreased in 2005-2007. The same may be said of the international clientele's broad number of interests over the course of the whole year, as well as individual types of tourism. Data collected for individual regions and towns may vary significantly.

Motives of international visitors to Slovakia between 1998-2007

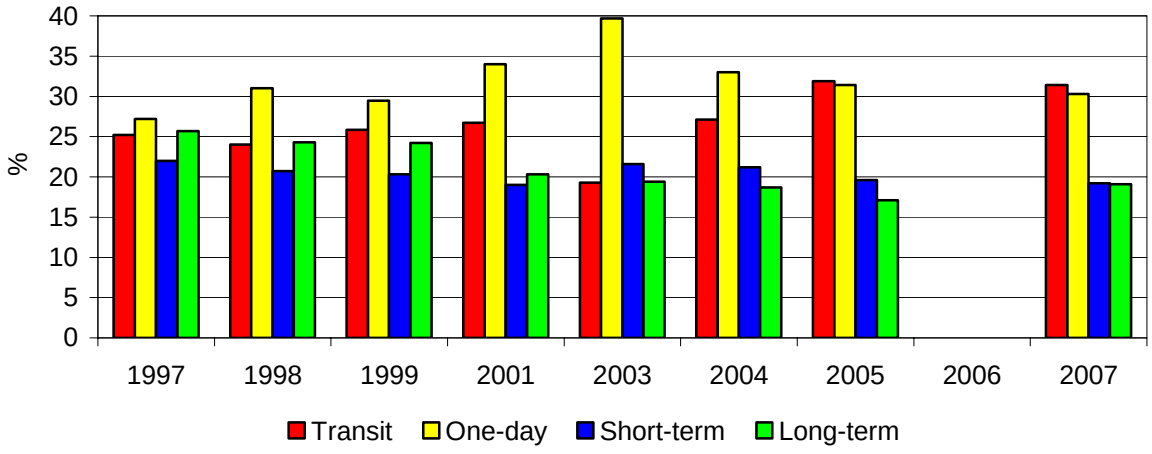


Source: MoE SR

Note. In 2006, no selection statistical survey was implemented in the area of active international tourism. For this reason it is not possible to supply information on motives of international tourists to Slovakia for 2006. In 2007, no data on the motive of skiing was surveyed.

Structure of international visitors by the length of stay is not positive. On one hand**, number of transit tourists was increasing** in the years 2003-2007**, on the other hand, number of short-stay visits, while the number of long-stay tourists stagnated.** Category of international tourists who do not use accommodation facilities (transit and one-day) has always shown one-half to two-thirds share. Category of long-term tourists who bring the greatest economic benefit to the area of tourism represents only less than one-fifth.

Types of international visitors to Slovakia between 1997-2007

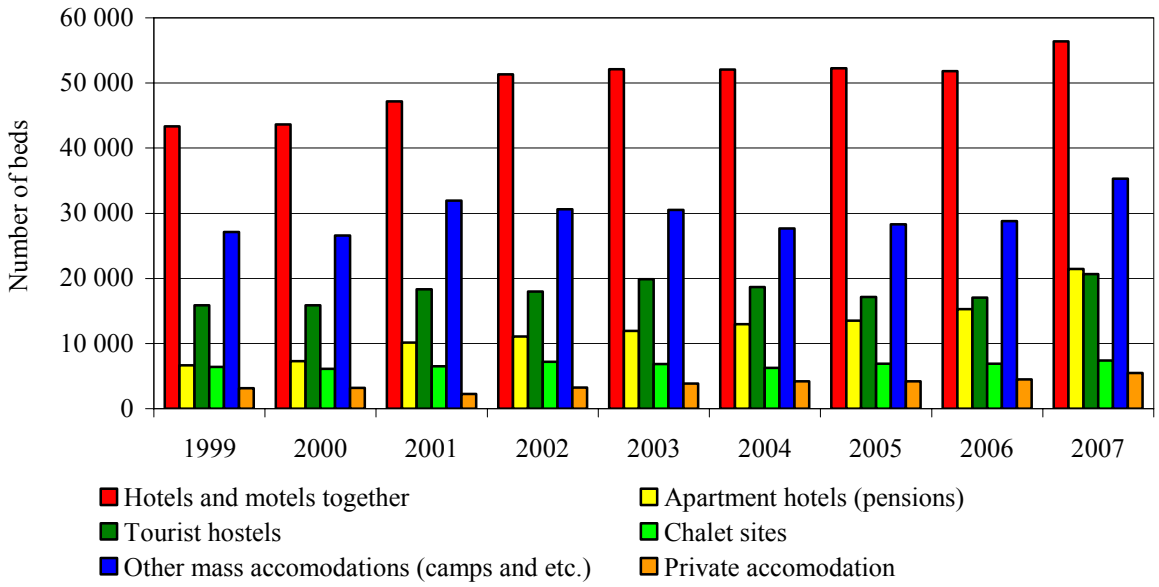


Source: MoE SR

Note. In 2006, no selection statistical survey was implemented in the area of active international tourism. For this reason it is not possible to provide any information on motivational factors of international visitors to Slovakia for the year 2006.

Increase in the bed capacity of accommodation facilities in 1999-2003 can be assessed positively as this increase has been caused especially by increase in the number of more affordable small environment friendly accommodation facilities – pensions and hostels. **With the exception of beds in pensions and recreational cabin facilities, trend in the number of beds in all other accommodation facilities stagnated in 2004-2006. There was again a significant increase in the number of beds in all accommodation facilities in 2006-2007, especially in the case of pensions (increase by 40,3 %), tourist hostels (increase by 21,4 %), other mass accommodation (increase by 22,5 %) as well as private accommodation (increase by 22,6 %).**

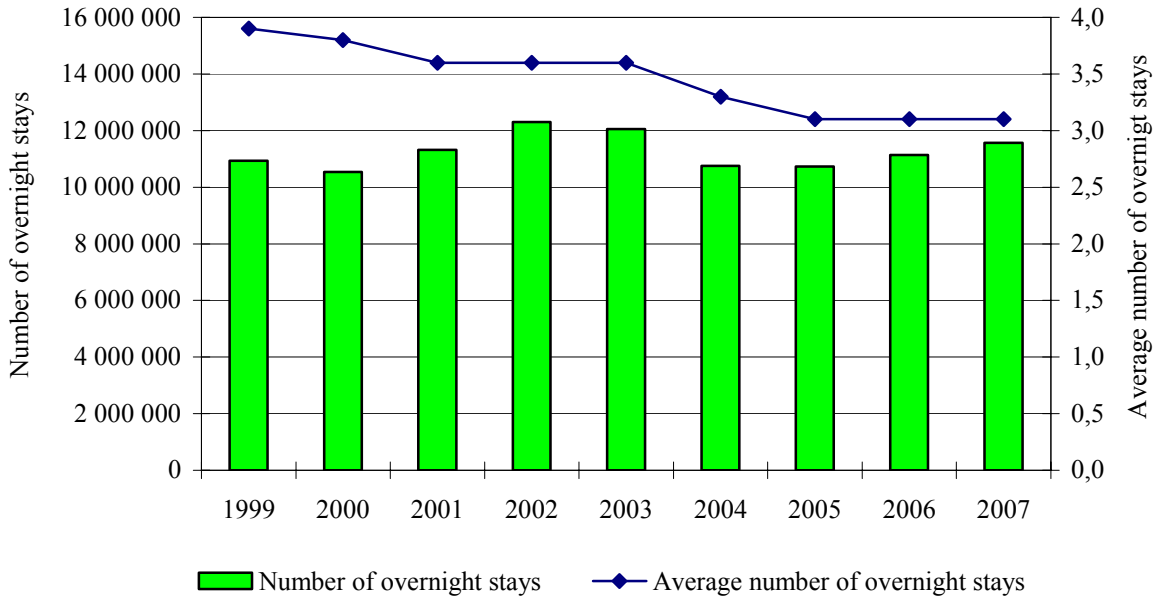
Capacity of tourism accommodation (number of bed places) in Slovak Republic between 1999-2007



Source: SO SR

Notwithstanding the fluctuating characteristics of statistical data, **number of overnight stays** is still stagnating. Most importantly; however, **average number of overnight stays decreases continually or even stagnates**. This relates to the attractiveness of the tourist destination and the level of development of its infrastructure. This is what influences the length of actual stays.

Overnight stays in tourism accommodation between 1999-2007



Source: SO SR

♦ **Demand of tourism on exploitation of resources**

In terms of national economy, **tourism with its little demand on material resources does not represent a significant demanding sector.** This fact is especially important for a country like Slovakia that depends much on export.

Demand of tourism on the exploitation of natural resources and land occupation is **important especially on the local** level. This phenomenon is caused by major seasonal differences in the number of tourists to individual tourist destinations. Compared to other economic activities, it is not possible, for example, to supply data on the energy and material demand of tourism, because of the lack of good data retrieving and collecting mechanisms to meet specific indicators. **Tourism,** being an economic sector, **does not place high demands on water, fuel, or energy consumption.** These demands, however, are normally typical for major fluctuations between high and low tourist seasons.

♦ **Environmental impact of recreation and tourism**

Intensity of tourist activities is not uniformly distributed over the area. Most tourist-attractive and at the same time most potentially endangered territories, due to mountain tourism activities, include especially national park territories. Sites for mountain tourism activities are concentrated within Tatra National Park (Roháčska valley in the West Tatras, and Mlynická, Mengusovská, Velická, Malá, Veľká Studená, and Skalnatá valleys in High Tatras), Low Tatras National Park (Demänovská and Jánska valleys, and northern slopes of Chopok, Bystrá valley, and southern slopes of Chopok), and Malá Fatra National Park (Vrátna valley). In terms of density of marked cycling and tourist trails, **the most fragmented territories**, in terms of their size, **are the areas of Pieniny National Park, NP Muránska Plane, and NP Slovenský raj.**

Number of locations for so called active sports in national parks behind the border of municipal construction zones (§14, part 1, letter b, c, d) of the Act No. 543/2002 Coll. on Nature and Landscape Protection between 2001-2007

Name of protected area	Mountain cilimbing and rock climbing	Ski-alpinism	Camping, bivouac	Ski areas	Cross country skiing **	Bicycle marked paths **	Hiking marked paths **
The Tatranský National Park							
2001	whole territory*	6				150/0.20	600/0.81
2002	whole territory*	6				150/0.20	360/0.49
2003	whole territory*	6	1	7	108/0,14	150/0.20	690/0.93
2004	whole territory*	6	1	7	108/0,14	150/0.20	690/0.93
2005	whole territory*	6	1	7	108/0,14	150/0.20	690/0.93
2006	whole territory*	6	1	7	108/0,14	160/0.22	690/0.93
2007	whole territory*	6	1	7	108/0,14	160/0.22	690/0.93
♦ **The Low Tatras National Park**							
2001	4	1				201/0.25	800/0.98
2002	4	1				201/0.25	800/0.98
2003	4	1	6	6		201/0.25	800/0.98
2004	4	6 (3 zones, 2 paths, 1 site)	7	6	40 + suitable tourist marked trails	718/0.39 (including national park protection zones)	800/0.44 (including national park protection zones)
2005	4	6 (3 zones, 2 paths, 1 site)	7	6	40 + suitable tourist marked trails	718/0.39 (including national park protection zones)	800/0.44 (including national park protection zones)
2006	4	6 (3 zones, 2 paths, 1 site)	7	6	40 + suitable tourist marked trails	718/0.39 (including national park protection zones)	800/0.44 (including national park protection zones)
2007	4	6 (3 zones, 2 paths, 1 site)	7	6	40 + suitable tourist marked trails	718/0.39 (including national park protection zones)	800/0.44 (including national park protection zones)
♦ **The Malá Fatra National Park**							
2001	1	1				0	157/0.69
2002	1	1				0	157/0.69
2003	1	1		2		0	157/0.69
2004	1	1	-	2	-	-	157/0.69
2005	5	-	4	2	15 + 157 tourist marked trails	35	157/0.69
2006	5	-	4	2	15 + 157 tourist marked trails	35/0.15	157/0.69
2007	5	-	4	2	15 + 157 tourist marked trails	35/0.15	157/0.69
♦ **The Pieniny National Park**							
2001	0	0				15/0.4	60/1.6
2002	0	0				15/0.4	60/1.6
2003	0	0	2	1	9	15/0.4	60/1.6
2004	-	-	1	1	9	15/0.4	60/1.6

2005	-	-	2	1	22/0,59	15/0.4	60/1.6
2006	-	-	2	1	22/0,59	15/0.4	60/1.60
2007	-	-	2	1	22/0,59	15/0.4	60/1.60
♦ **The Slovenský raj National Park**							
2001	1	0	3	5	1	60/0.3	275/1.39
2002	1	0	3	5	1	44,5/0.2	215/1.09
2003	5***	0	3	5	1	44,5/0.2	215/1.09
2004	5***	-	3	5	1	44,5/0.2	215/1.09
2005	5***	-	3	7	50/0,39 (suitable tourist marked trails including protection zones of national parks)	118,5/0.1(including Protection zones of national parks)	215/1.09
2006	5***	-	3	7	50/0,39 (suitable tourist marked trails including protection zones of national parks)	118,5/0.1(including Protection zones of national parks)	215/1.09
2007	1	0	4	9	50/0,39 (suitable tourist marked trails including protection zones of national parks)	118,5/0.1(including Protection zones of national parks)	215/1.09
♦ **The Muránska plane National Park**							
2001	3	0				0	318/1.57
2002	1	0				0	318/1.57
2003	1	0				0	318/1.57
2004	2	0	3	0	26/0,13	13/0.06	318/1.57
2005	2	-	3	-	26/0,13	13/0.06	318/1.57
2006	2	-	3	-	26/0,13	13/0.06	318/1.57
2007	2	-	3	-	50 + all tourist marked trails - i.e. 362 (NP including protection zones)	147 (NP including protection zones)	318 (NP including protection zones)
♦ **The Poloniny National Park**							
2001	0	0				0	119/0.4
2002	0	0				0	119/.0.4
2003	0	0	2	1	0	0	119/0.4
2004	0	0	2	1	0	0	119/0.4
2005	-	-	2	1	119/0,4	44/0.15	119/0.4
2006	-	-	2	1	119/0,4	44/0.15	119/0.4
2007	0	0	2	1	121/0,41	44/0.15	121/0.41

♦ **The Slovenský karst National Park**							
2001							
2002	1	0				38/0.19	270/0.78
2003	1	0				38/0.19	270/0.78
2004	1	0				38/0.19	270/0.78
2005	1	-	-	-	-	38/0.19	270/0.78
2006	1	-	5	-	-	38/0.19	270/0.78
2007	1	-	5	-	Suitable tourist marked trails	38/0.19	270/0.78
♦ **The Veľká Fatra National Park******							
2001	3	0				100/0.25	200/0.5
2002	3	0				100/0.25	200/0.5
2003	3	0	0	3	0	100/0.25	299/0.74
2004	5			3		100/0.25	299/0.74
2005	8	1	6	3	300/0,74	103/0.26	300/0.74
2006	8	1	6	3	302/0,75	103/0.26	302/0.75
2007	8	1 + tourist marked trails	6	3	302/0,75	103/0.26	310/0.77
♦ **Total**							
2001						**526/0.16**	**2,529/0.8**
2002	**9 +TANAP**	**8**				**548/0.17**	**2,499/0.79**
2003	**15 +TANAP**	**8**	**14**	**25**	**118**	**548/0.17**	**2,928/0.92**
2004	**18 +TANAP**	**13**	**17**	**25**	**184 + NAPANT**	**1,078.5 km**	**2,928 km**
2005	**25 +TANAP**	**13**	**28**	**27**	**680 + suitable tourist marked trails**	**1,234.5 km**	**2,929 km**
2006	**26 +TANAP**	**13**	**33**		**682 + suitable tourist marked trails**	**1,244.5 km**	**2,931 km**
2007	**21 +TANAP**	**13 + tourist marked trails**	**34**	**29**	**875 + suitable tourist marked trails**	**1,378.5 km**	**2,941 km**

Source: SNC SR

* - except for 8 localities defined in the Visiting order of national park, where climbing is forbidden
** - in case of cross country skiing, cyclo-tourism and hiking, information is available on length of the marked tracks, marked bicycle paths and of the marked hiking paths in km or in km/km^2
***- include climbing the ice falls
**** - Slovenský kras a Veľká Fatra were declared national parks in 2002

Permanent increase in length of erosion-impacted tourist marked trails presents a significant environmental issue. These trails are in the zone above the upper forest border and in precipices where, due to extreme climate conditions, exist greatly deteriorated local conditions for regeneration of soil and the flora. **Critical soil erosion** may be seen at marked tourist trails **in the territory of the national parks of Low Tatras** (2006-2007), **Malá Fatra** (substantial erosion increase over the years 2002-2003), and **Muránska Plane National Park** (substantial erosion increase over the years 2004-

2005). **Significant erosion** exists also **in the territory of Slovenský Raj National Park**. **In 2004-2005, significant increase in erosion of marked tourist trails was recorded also in the territory of the Tatranský National Park.**

Soil erosion on documented tourist hiking trails and cyclotrails in the territories of national parks between 2001 - 2007

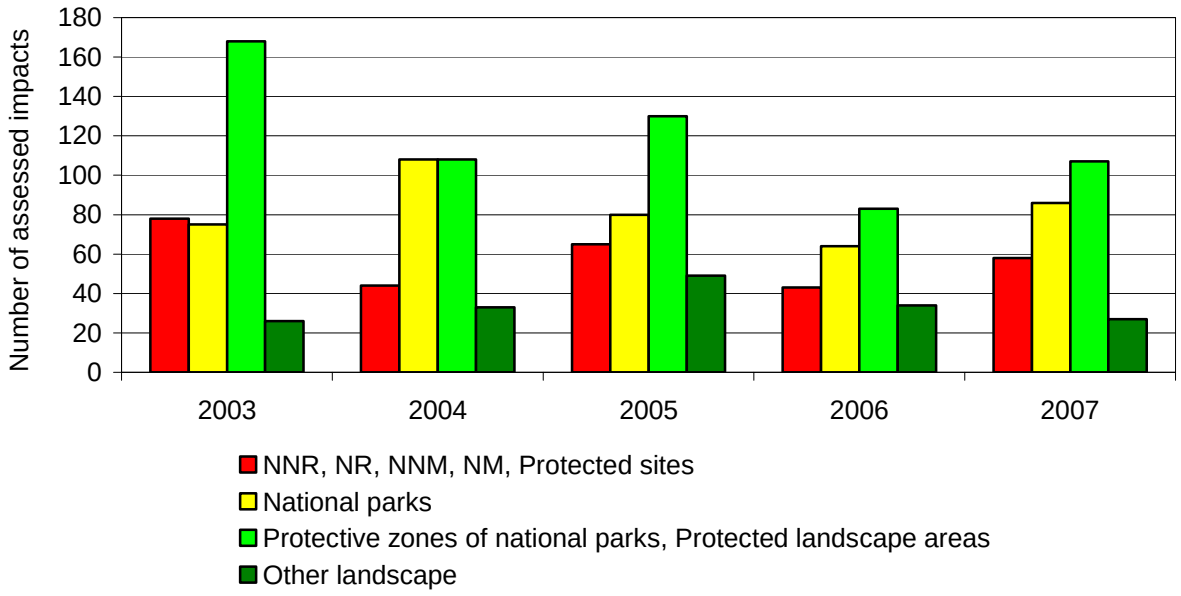
Year	Overall length of the marked bicycle paths affected by erosion (km/% of the total length)	Overall length of the marked hiking paths affected by erosion (km/% of the total length)
2001	2/0.38	576/22.7
2002	7.5/1.37	630/25.2
2003	12/2.19	732/25.0
2004	13.8/1.3	778/26.6
2005	17/1.5	878/30.0
2006	15/1.4	883/30.1
2007	19.1/1.8	957/32.9

Source: SNC SR

Highest degree of endangerment of small-size protected areas from tourism exists in the following territories: Tatras National Park, NP Low Tatras, NP Malá Fatra, NP Pieniny, NP Slovenský raj, PLA Dunajské luhy, PLA Malé Karpaty, PLA Strážovské hills, PLA Poľana, PLA Cerová vrchovina, and PLA Vihorlat.

Although all categories of protected areas together cover only about 18% of the SR size, to them relate 60-80% of assessed impacts to nature and landscape that require permission of pertinent nature conservation authority (especially areas of TANAP, NP Nízke Tatry, NP Slovenský raj, and NP Malá Fatra. In the category of protected areas, most assessed impacts in 2004-2007 **permanently belong to protection zones of national parks and protected landscape areas and national parks, while open landscape is least represented. With the exception of open landscape, these impacts have grown in 2006-2007.**

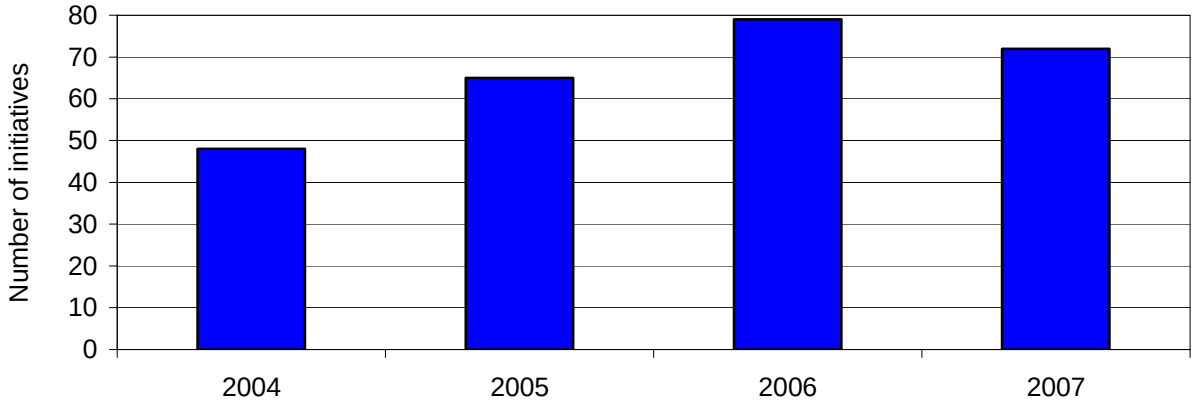
Number of assessed impacts on natural landscape related to tourism activities between 2003-2007



Source: SNC SR

In case of tourism-related initiatives that were assessed in terms of environmental impact we can say that after their very significant growth in 2004-2006, they slightly decreased in 2006-2007.

Number of initiatives related to tourism activities assessed in terms of their impact on environment between 2004-2007



Source: MoE SR

Healthy conditions of living and working conditions shall be created and secured by conservation of air, water, land and other elements of environment...

§13a of the Act No. 272/1994 Coll. on Protection of Human Health as subsequently amended

• PUBLIC HEALTH

Life expectancy at birth

Average life expectancy at birth is rising for both genders, reaching 70.51 years for men and 78.08 years for women in 2007. The SR population is aging at the base of the age pyramid, i.e. from the bottom, due to a reduction in fertility and natality, as well as near the top of the age pyramid due to an increasing average life expectancy.

Morbidity and mortality

In 2007, there were 28 226 deaths for men and 25 630 deaths for women. Compared to 2006, this is higher by 135 deaths in men, and 420 deaths in women. In 2007, men comprised 52 % of deaths, while women 48 %.

Greatest public mortality both in men and women over a long time period has been from **circulatory system diseases**, with 29 289 deaths, which is 47.9 % in men and 55.9 % in women. Second most frequent cause of death for both, men and women, are still **tumours**. Compared to the last year, cancer shows a slightly rising tendency, with 11,966 deaths in 2007, which is 24.4 % of men and 18 % of women. There appears to be a slightly rising trend, compared to 1993. In men, third most frequent cause of death is **injuries and poisonings and other external causes** (8.3 %). In women, the third most frequent cause of death includes **respiratory diseases** with a slight reduction, compared with the last year (4.7 %).

Public Health – selected indicators

Indicator	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Life expectancy at birth											
• Men	68.9	68.6	68.95	69.15	69.51	69.77	69.76	70.29	70.1	70.4	70.51
• Women	76.7	76.8	77.03	77.23	77.54	77.57	77.62	77.82	77.9	78.2	78.08
Live births per 1 000 inhabitants	11.0	10.7	10.4	10.2	9.5	9.5	9.6	10.0	10.1	10.0	10.1
Deaths within 1 year of age per 1 000 live births	8.7	8.8	8.3	8.6	6.2	7.6	7.8	6.8	7.2	6.59	6.1
Infant mortality rates	5.4	5.4	5.1	5.4	4.1	4.7	4.5	3.9	4.1	3.53	3.4
Deaths	52 124	53 156	52 402	52 724	51 980	51 532	52 230	51 852	53 475	53 301	53 856
Deaths per 1 000 inhabitants	9.7	9.9	9.7	9.9	9.7	9.6	9.7	9.6	9.9	9.89	10

Source: SO SR

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

♦ **Air dose equivalent rate**

Input of the external photon dose equivalent in air H (nSv.h^{-1}) in 2006 in the early alarm networks of in the whole SR territory reached the average value of 107.1 nSv.h^{-1}. Average annual effective dose E (μSv) for the whole SR territory was 937 μSv 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 μBq.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 Bq.m^{-2} in Slovakia.

♦ **Contamination of other environmental compounds**

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

♦ **Radon and its radioactive decay products**

The basic public health legislation on protection against the adverse effects of ionizing radiation is Act No. 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: - cosmic radiation - terestrial gama radiation - radio-nuclides in body - radon and the products of mutation	**2.94** 0.39 0.46 0.29 1.80	**650**
Medical exposure together. from that: - diagnostics - radiotherapy	 0.8 – 1.0 -	
Atmospheric testing of nuclear weapons	-	30
Radio-nuclides outlet	-	2

Source: PHA SR

Nuclear institutions

Nuclear Regulatory Authority (NRA SR) is an independent central state administration authority, headed by the Chief Officer. In 2007, atomic law restatement was discussed in four parliament committees and subsequently approved. Act that amends and supplements the atomic Act No. 541/2004 Coll. as amended, was adopted on 7.2.2007 and published in Collection of Laws of SR on March 7, 2007. NRA SR drafted an amendment to the atomic law as part of its legislative activities in 2007. The amendment is based on transposition of EU Council Directive 2006/117 Euratom on supervision and controls at transboundary transport of radioactive waste and burnt nuclear fuel.

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: NRA SR

Slovakia is a signatory to all major international agreements and conventions in the area of peaceful exploitation of nuclear energy.

- **Activity of nuclear institutions in SR**

NPP V-1 Bohunice

First NPP block of Bohunice V-1 was put out of operation in December 2006 and in 2007 was in regime 5, i.e. fuel in the reactor and the primary circuit cooled by natural circulation. Second NPP V-1 block in Bohunice was in operation in 2007 according to demands of Slovak energy control centre.

In 2007, NPP – EBO V-1 detected 7 occurrences, 3 of them within the INES 0 degree, and none in the INES 1 degree.

NPP V-2 Bohunice

Both NPP Bohunice V-2 blocks in 2007 operated with new type of core fuel with the content of second-generation gadolinium that contributes to a more efficient use of fuel and more balanced distribution of output in the reactor's active zone. Implementation of periodic assessment of nuclear safety at NPP V2 in Bohunice after 10 years of operation was major event in 2007. Preliminary results of NRA SR assessment suggest that current condition of nuclear safety of NPP V-2 Bohunice after the completion of MOD V-2 modernization program, implementation of corrective measures and elimination of faults detected by test can be a good starting point for safe operation of NPP V-2 Bohunice until the next periodic nuclear safety assessment.

In 2007, both NPP V-2 blocks detected 21 operation occurrences, 18 of them assessed under the INES 0 degree.

NPP Mochovce 1,2

In 2007 in NPP Mochovce 1,2 planned shutdowns were implemented at the blocks for overhauls and fuel changes. Both shutdowns were implemented as planned.

There were two major operation events in NPP Mochovce 1,2 in 2007. The first event relates to insufficient sealing of primary circuit (PC) return valve, while the second event relates to faults in set paths for measuring sealing characteristics of PC equipment division planes.

In 2007, there were 13 occurrences in NPP Mochovce, 5 of which were classified under the INES 0 degree.

Nuclear power plants under construction

At present, one atomic power plant is under construction in Slovakia - NPP Mochovce 3,4 in the ownership of SE, inc..

NPP Mochovce 3, 4

Conservation and protection works on 3rd and 4th blocks of NPP Mochovce continued also in 2007. NRA SR periodically controls and assesses their condition. Planning works began in 2007 as a result of a decision of the owner of the plant. Their result should involve continuing construction of blocks 3 and 4.

Nuclear power plants to be phased out

In 2007, one atomic plant – NPP A-1 in Bohunice was phased out. After the SE inc. division, the plant became the ownership of JAVYS, inc. Block 1 of the NPP Bohunice V-1 that terminated output operation in 2006 as a result of government decision on early termination of operation of NPP Bohunice V-1 blocks in 2006-2008.

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. In 2007, program of gradual translation of burnt nuclear fuel from original T-12 tanks to new KZ – 48 tanks was terminated. This gradually increases storing capacity of storage.

Technology of processing and treatment of radioactive nucklear 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. In 2007, a decision to launch the operation of discontinual line designated to fix ions and sludge into bituminous matrix was issued.

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

Final processing of liquid radioactive waste (RAW) sludge, Mochovce is in the ownership of JAVYS, inc. and aims at final processing of liquid radioactive waste from the operation of NPP Mochovce into the form appropriate to be stored within radioactive waste deposit. Technology consists of two individual processes involving bituminization and cementation. In 2007, NRA SR assessed documentation that served as a basis for issued permit for test operation of this nuclear facility. The authority was inspected in order to verify its present condition and readiness for test operation. In 2007, this nuclear facility still did not operate in permanent mode.

Nuclear facilities to be phased out

VUJE, inc. owns two experimental nuclear facilities – bituminization line and RAO incinerator, both in the I-st. stage of phase-out.

♦ **Handling with radioactive waste**

Handling of radioactive waste constitutes an integrated system that includes the collection, separation, storage, processing, treatment, manipulation, and discharge of radioactive waste. Current policy of handling radioactive waste in the SR builds on the following steps:

- treatment of RAO into an acceptable form to be contained or stored over longer time periods,
- depositing low and medium radioactive RAO into a surface discharge site and a long-term storage of RAO unacceptable to be deposited at the surface discharge site,
- survey and development of subterranean storage of burnt nuclear fuel and RAO unacceptable to be deposited at the surface storage site.

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 contuinued in its close cooperation with the supervising authority over the chemical legislation (SR Ministry of Economy).

On June 1, 2007, a new EC Regulation 1907/2006 became effective in all EU member states. This legislation addresses registration, evaluation, authorisation, and restriction of chemical substances (REACH) and also establishes the European Chemical Agency. This legislation amends and supplements Directive 1999/45/EC and supersedes Council Regulation (EEC) 793/93 and Commission Regulation (EC) 1488/94, Council Directive 76/769/EEC, and Commission directives 91/155/EEC, 93/67/EEC, 93/105/EC, and 2000/21/EC (hereinafter only „the REACH regulation“). Over the last two decades and in light of new, progressive technologies, management of chemicals was re-evaluated and the Ministry of Environment of SR subsequently implemented impact assessment in line with the coming Slovak legislation related to environmental protection. In compliance with the provisions of REACH, businesses that produce or import chemicals will be responsible to adopt necessary risk management measures that follow the assessed risks associated with their chemicals, based on information on these substances. This regulation established the European Chemical Agency (hereinafter only "agency"), which will control chemical substances. It will be necessary to restructure restrictions regarding the use of certain chemicals and to substitute the effective Council Directive 76/769/EEC.

Changes arising from the amended Council Directive 67/548/EEC will be transposed and subsequently implemented by the SR Ministry of Economy into the Slovak legal system. This will specifically be done through novelization of Act 163/2001 Coll. on chemical substances and chemicals as amended. **Important objective of the REACH regulation is to encourage substituting hazardous chemicals with less hazardous chemicals or technologies wherever there are suitable alternatives. However, also these alternatives must be very strictly controlled and monitored. Environmental control and monitoring will be the responsibility of the SR Ministry of Environment, through its organizations.**

The **Rotterdam Convention** on prior informed consent procedure for certain hazardous chemicals and pesticides in international trade is a major international law instrument to improve international regulation of trade with certain hazardous substances and pesticides. This Convention entered in effect **for Slovakia on April 26, 2007**. The Rotterdam Convention represents a suitable instrument to limit the use of hazardous chemical substances at global level.

SAICM

Ministry of Foreign Affairs of Slovak Republic nominated the Ministry of Environment, department of environmental risk management, to be the national contact site for Strategic approach to international chemicals management (SAICM) in Slovakia. In 2007, MoE SR was involved in preparing the strategy and participated in workshops of the SAICM organizations.

POPs-management

POPs-management in SR involves relevant activities as part of the initial phase of international document implementation pursuant to EC Regulation 850/2004 on POPs, amended by Council Regulation (EC) 1195/2006, Council (EC) Regulation 172/2007, and Commission (EC) Regulation 323/2007. In 2007, Commission Decision 2001/639/EC which establishes common format for submitting determined and measured data and information.

Priorities of this area include elimination of POPs-pesticides and PCB-containing waste. With regard to the need for funds to address this issue, there is a possibility to receive a contribution from **The Environment Operational Programme, the Waste Management Priority Axis 4** being part of the 4.3. operational objective, focused on environment-friendly hazardous waste handling approaches.

Xenobiotics in the food chain

Limits published in the Slovak Food Codex that are compatible with the EU limits regulate the volumes of xenobiotic substances added to food to extend its life cycle, improve technological production concept, aroma, colouring agents, as well as contaminants from industrial production and environmental pollution.

Monitoring of the cccurrence 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.

45 132 samples were extracted over the entire monitored period (17 years), containing **2 827** limit-exceeding samples, which represents **6.3%.** Monitoring was carried out for 668 agricultural subjects (in 75 districts), analyzing soil samples from 457,000 ha. **In 2007**, total number of **1 549 samples** were extracted from 626 hunts and subsequently analysed for content of chemicals, nitrates, and nitrites. Monitoring was implemented for 51 agricultural subjects in 37 districts, with analysis of the soil samples from 28 994 ha, including the crop produced from this soil.

Summary of results from Coordinated Target Monitoring in 2007

Commodity	No. of analyses	No. of samples	No. of limit-exceeding samples of IS	% IS	Xenobiotic substances
Soil	5 836	958	0	0	
Water	1 564	182	2	1.1	
Including:					
Water for irrigation purposes	972	108	0	0	

Water for feeding	592	74	2	2.7	Nitrates
Forage	2 931	388	0	0	
Including:					
Forage from hunts	1 960	303	0	0	
Trough forage samples	971	85	0	0	
Raw matter	3 148	389	0	0	
Including:					
Raw matter of plant origin	1 096	180	0	0	
Raw matter of animal origin	2 052	209	0	0	

Source: FoRI SR

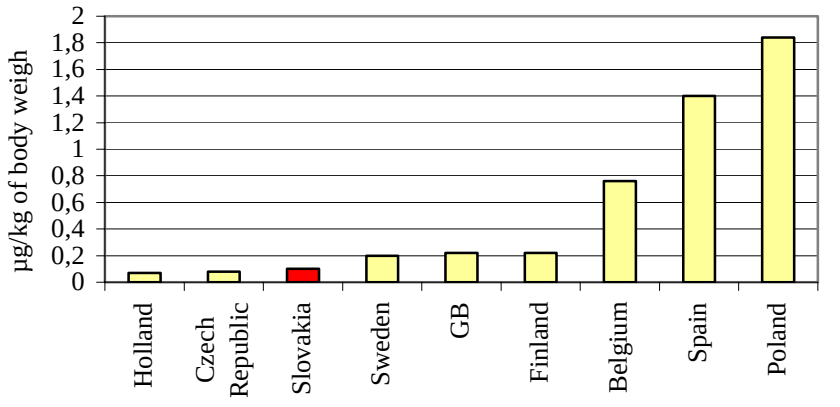
We can say that in terms of the overall assessment of contamination by all xenobiotic substances at once per individual commodities, percentage of the limit-exceeding samples dropped **since 1991,** while it must be noted that the limit values have been changing over the period of 16 years.

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 weakly intake (PTWI) as well as acceptable daily intake (ADI).

Over the period of **fifteen years, 10 931 samples** were analysed, including **510** samples, i.e. **4.7%** that exceeded permitted limit values, especially in nitrates, chemical elements, and pesticides. **In 2007, 554 samples** were analysed, including **16** samples (i.e. **2.9 %)** that were unacceptable.

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



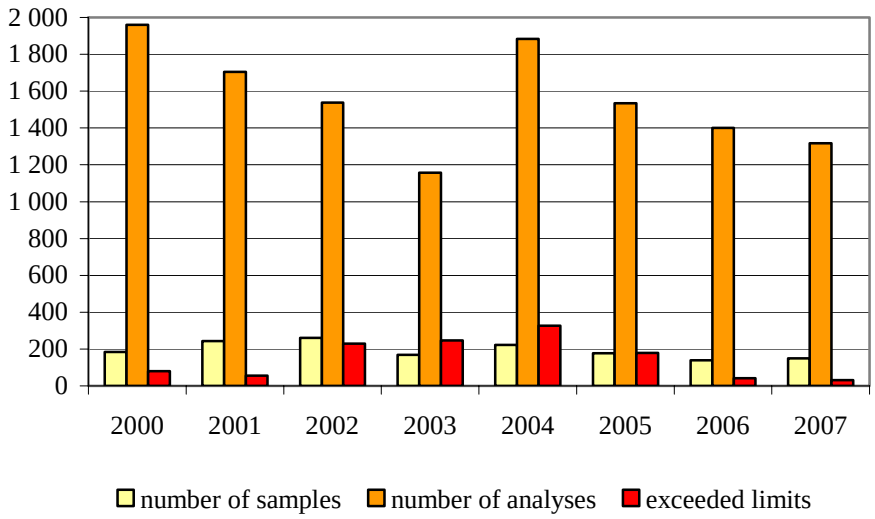
Source: FoRI

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 is carried out in order to continue collecting data and information on impacts of ecological factors of the external environment on a selected type of game in designated regions of Slovakia. In 2007, 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.

Over the period of **thirteen years, 3 355 samples** were extracted within the monitoring, of which **21.6%** did not comply with the limit values. Greatest number of non-compliant samples over the whole monitored period was detected for chemical elements and PCBs. In **2007, 149 samples** were extracted, of which **21.5%** exceeded the limits.

Comparison of number of samples, analyses, and exceeded limits (total) for the years 2000-2007



Source: SVA SR

*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

The year 2007 was the second year of meeting the objectives of the Programme of Waste Management of the Slovak Republic for the years 2006-2010.

Balance of waste generation

Waste generation (t)

Waste category	Amount (t)
Hazardous waste	663 299.73
Other waste	14 456 137.35
Municipal waste	1 668 648. 31
Total	**16 788 085.39**

Source: SEA, SO SR

Generation of waste located on the market (t)

Waste category	Amount (t)
Hazardous waste	525 165.60
Other waste	8 740 682.17
Municipal waste	1 668 648.31
Total	**10 934 469.08**

Source: SEA, SO SR

Compared to 2006, the annual increment in waste put on the market is about 25 %. **Other waste** is the greatest waste category responsible for this situation, with as much as 29 % annual increment.

The increase existed in hazardous waste generation by 2 %, 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.

In the area of waste generation **by economic activities** classification, **manufacturing industry** has been the **dominating** component over the recent years, **with 55 %** share. Sector of building industry follows with 22 %, agriculture with 7 %, 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 2007 (t)

Economic sector	Total	Hazardous waste	Other waste
Agriculture	649 497.45	12 635.65	636 861.80
Fishery	671.72	0.22	671.50
Industry total	5 053 345.77	332 868.92	4 720 476.85
Building industry	2 039 422.02	27 550.74	2 011 871.28
Trade	367 973.00	29 891.34	338 081.65
Hotels and restaurants	2 997.88	114.98	2 882.90
Transport and communications	137 291.70	67 544.56	69 747.14
Banking and insurance sector	324.10	83.79	240.31
Activities in domain of real estate	244 324.30	5 920.98	238 403.32
Public administration and defence	27 367.31	1 086.45	26 280.86
Education	1 592.38	103.43	1 488.95
Health service	245 418.98	2 743.51	242 675.47
Waste water treatment and waste disposal	257 669.54	37 053.29	220 616.25
Unknown	237 951.61	7 567.72	230 383.88
Total	**9 265 847.76**	**525 165.60**	**8 740 682.17**

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	81 572.52	1 051.81	80 520.71
O	Handing over to another subject	425 564.59	19 824.73	405 739.86
Z	Storage of waste	314 199.58	20 365.65	293 833.93
Total		**821 336.69**	**41 242.19**	**780 094.50**

Source: SEA

Waste recovery

There were **3 483 168 tons of waste recovered** in the SR in 2006. This represents **32 % of total volume of waste** located on the market. R10 activities – tratment of soil for the purposes of agricultural returns or for improving the environment show a has the greatest share on waste reclamation (22 %). R5 activity – Recycling or re-extraction of other inorganic compounds show a 21 % share, R3 activities – Recycling or re-extraction of organic compounds that are not used as solvents (including composting and other biological transformation processes) show a 15 % share.

Waste recovery following codes R1 – R13 in year 2007 (t)

Code of recovery	Total	Hazardous waste	Other waste
R01	161 752.17	7 144.84	154 607.34
R02	3 313.61	3 230.05	83.55
R03	527 963.82	19 367.36	508 596.46
R04	468 079.98	9 457.25	458 622.73
R05	738 631.66	3 920.26	734 711.39
R06	677.69	362.37	315.32
R07	491.24	37.05	454.19
R08	2 367.00	2 345.00	22.00
R09	12 275.93	12 244.48	31.45
R10	757 041.65	5 751.94	751 289.71
R11	133 711.78	450.20	133 261.58
R12	79 789.42	6 357.12	73 432.30
R13	597 072.26	27 383.14	569 689.12
Total	**3 483 168.21**	**98 051.07**	**3 385 117.14**

Source: SEA

Waste disposal

Of total volumes of generated waste, **45 % of waste was disposed,** which in absolute numbers means **4 961 342.87 tons of waste.** Dominance of landfill waste is a historical rule, with a 86 % share on total waste disposal. As of December 31, 2007, there were 151 landfills operated in Slovakia.

Number of landfills (towards 31.12.2007)

Region	Hazardous waste landfills	Landfills for not hazardous waste	Inert waste landfills	Total
Bratislava	2	11	2	15
Trnava	2	11	1	14
Trenčín	1	15	3	19
Nitra	3	18	2	23
Žilina	0	16	2	18
Banská Bystrica	1	19	2	22
Prešov	1	20	1	22
Košice	3	13	2	18
Total	**13**	**123**	**15**	**151**

Source: SEA

Waste disposal following codes D1 – D15 in year 2007 (t)

Code of disposal	Total	Hazardous waste	Others waste
D01	4 269 207.25	132 287.24	4 136 920.02
D02	136 485.98	93 195.47	43 290.50
D03	10.22	10.22	0.0
D05	130.36	60.71	69.65
D08	69 839.40	34 942.33	34 897.07
D09	107 154.34	84 323.14	22 831.20
D10	84 588.95	27 501.64	57 087.31
D11	38.22	27.90	10.32
D12	137.83	25.53	112.30
D13	14 690.86	90.00	14 600.86
D14	1 350.13	405.29	944.84
D15	277 709.33	13 002.86	264 706.46
Total	**4 961 342.87**	**385 872.33**	**395 260.02**

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)

Summary reports by producers of electrical equipment for the year 2007

Category under Annex 3 of the waste law	Introduced to market (kg)	Collected (kg)	Processed (kg)	Recovered (kg)	Recycled (kg)
1. Big domestic appliances	28 624 066	8 499 804	8 311 204	7 212 313	7 160 955
2. Small domestic appliances	3 260 568	744 171	744 171	594 830	572 308
3. IT and telecommunication devices	5 408 045	1 933 154	1 933 214	1 713 828	1 668 720
4. Consumer electronic devices	6 085 362	1 623 252	1 623 146	1 405 323	1 348 850
5. Sources of light	3 044 460	49 889	172 929	163 457	155 989
5a.Gass lamps	312 951	163 332	163 332	146 550	146 550
6. Electrical and electronic instruments	2 025 628	71 169	71 169	63 293	57 223
7. Toys, devices designated for sport and recreational use	90 603	3 686	3 686	2 874	2 518
8. Medical devices	69 644	67 413	67 413	57 608	57 294
9. Machines for monitoring and testing	32 006	28 202	25 375	21 590	21 449
10. Vending machines	97 381	17 461 126	97 495	87 296	86 606
	49 050 713	**30 645 198**	**13 213 134**	**11 468 963**	**11 278 462**

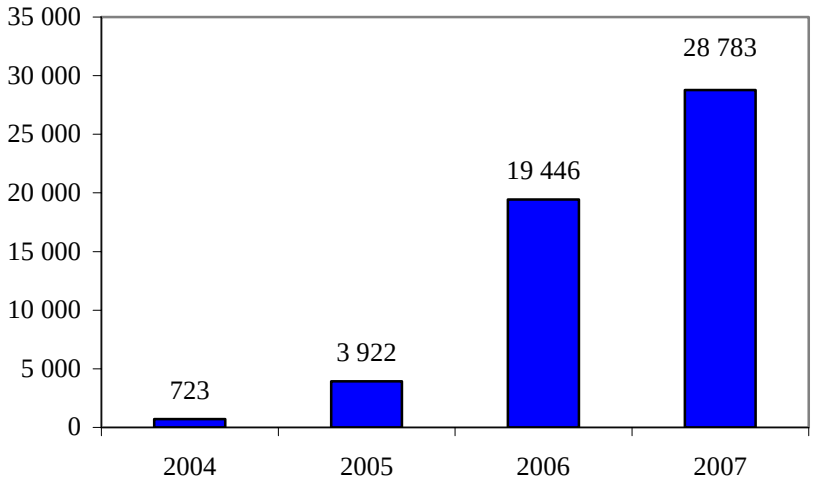
Source: SEA

There were placed on he market 49 thousand tons of electrical devices in Slovakia in 2007 (9 kg per habitant). Amount of collected WEEE was approx. 30.6 thousand tons (5.6 kg per habitant).

Old vehicle

There were 28 783 old vehicle processed in 2007.

Processed old vehicle (amount of cars)



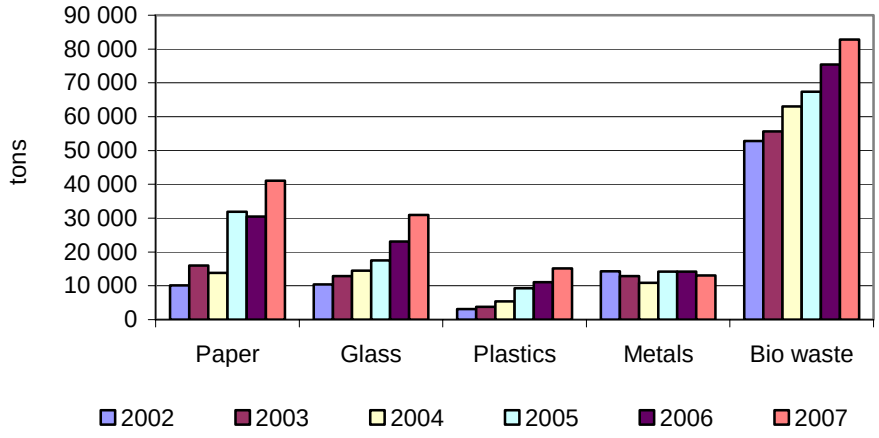
Municipal waste

According to data from the SO SR, there were **1 668 648 tons of total municipal waste** generated in Slovakia in 2007. Greatest municipal waste (MW) production was recorded in the Bratislava region, with 21 816 tons of KO more than in 2006. Least MW was produced in the region of Banská Bystrica. This volume represents **309 kg of municipal waste per capita.** Compared to 2006, this is an increase by 8 kg per capita. Long-term waste **disposal on landfills** (76 %) is the **most frequent method** of municipal waste handling, following by incineration with energy recovery (7 %) and composting by 5 % and incineration 4 %. .

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 2006.Volume of **recovered municipal waste per capita increased by 15 kg**.

Separated waste collection (t)



Source: SO SR

Financial mechanisms of waste management

- **Recycling fund**

The recycling fund completed its sixth-year existence in 2007.

Revenues from producers and importers of taxed commodities in 2007 represented more than 593 million SKK, which is 28 million more than in 2006. In 2007, the Recycling fund acknowledged more than 1 680 applications for funding from municipalities and businesses. In total, 647.5 million

SKK were approved for the applicants, which is by 282.5 million SKK more than in 2006. Recycling fund also acknowledged 1 330 applications of municipalities for the obligatory contribution to separated waste, in the sum of 1 300 to 1 800 SKK per ton of waste to be reclaimed. To this end, more than 63 million SKK were designated in 2007, which is an increase by more than 46 million SKK.

Thanks to the fund's financial contribution in 2007, Slovak Republic could, through contractual obligations of its recipients - businesses and municipalities - collect and separate 212 000 tons of waste. More than 134 000 tons of waste material was reclaimed through the fund's contribution. Subjects that received contribution from the fund collected and processed more than 28 000 old vehicles. In relation to projects implemented through the fund in 2007, increment in the newly-created jobs reached 148. Since 2002, total number of these new jobs has reached 930.

♦ **Environmental Fund**

In 2007, the Environmental Fund in the area of waste management, 74 applicants funded, with the amount of 198 mil. SKK.

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		Packaking waste	Recovered waste or waste incinerated with energy recovery				
			Material recycling	Recycling total	Other recovery methods	Waste incineration with energy recovery	Waste and energy recovery and waste incineration in total
Glass		98 033	14 329	14 329	984	-	15 313
Plastics		59 981	23 830	23 830	-	3 236	27 066
Paper/cardboard		110 244	67 072	67 072	-	2 702	69 774
Metals	4 460	1 311	1 311	272	272	1583	-
	9 939	2 123	2 123	362	362	2 485	-
	14 399	3 434	3 434	634	634	4 068	-
Wood		17 858	471	471	-	1 411	1 882
Total		**300 515**	**109 136**	**109 136**	**1 618**	**7 349**	**118 103**

Source: MoE SR

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

Over the period of 1.1.2007 to 31.12.2007, the MoE SR issued **151 decisions on trans-boundary transport of waste**.

Summary of the number of effective licenses for trans-boundary transport of waste, issued in 2007 (t)

Issued in year	Import	Export	Transit	Total
2007	41	7	3	**51**
2007- 2008	74	18	8	**100**
Total	**115**	**25**	**11**	**151**

Source: SEA

Total permitted volumes of waste by individual countries (t)

Country	Import to SR (t)	Export from SR (t)	Transit (t)
Belgium	-	5 500	-
Czech Republic	318 690	700	-
Netherlands	350	-	1 092
Croatia	500	-	-
Japan	100	-	-
Hungary	48 200	-	8 100
Poland	340 800	207 900	-
Austria	143 680	-	20 800
Romania	-	-	400
Italy	-	-	5 000
Germany	60 500	194	40 792
Switzerland	500	-	-
Ukraine	34 050	26 350	-
Great Britain	-	90	-
Total	**947 370**	**240 734**	**76 184**

Source: SEA

***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 2007, there was an increased number of occurrences that deteriorated the quality of surface and ground water. SEI alone registered 157 of emergency deteriorations or threats to water quality (EDW).

Special declination or quality menace of water of the SR in the years 1994-2007

Year	EDW recorded by SEI	Special deterioration of water					
		Surface			Ground		
		Total number	Watercourses and basins	Water courses	Total number	Pollution	Endanger-ment
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
2007	157	97	1	4	60	4	56

Source: SEI

In 2007 again, in terms of hazardous compounds, deterioration of water quality was caused mainly by crude oil compounds in 76 cases (48.7 %), waste water in 24 cases (15.2 %), and in 26 cases (16.5 %) no contaminant was detected. Livestock excrements in 12 cases (7.6 %), 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 1994-2007

Sorts of water deteriorative substances	1994	1996	1999	2000	2001	2002	2003	2004	2005	2006	2007
Oil substances	63	69	54	33	40	64	59	70	63	69	76
Alkalis	3	5	5	2	2	5	3	1	0	3	4
Pesticides	1	1	1	0	0	1	0	3	0	2	0
Excrements of farm animals	9	14	7	5	4	9	21	15	14	14	12
Silage fluids	0	1	2	4	0	2	1	1	0	0	0
Industrial fertilisers	0	0	0	0	0	0	1	0	0	0	0
Other toxic substances	5	1	6	12	5	3	3	0	4	4	5
Insoluble substances	4	4	1	5	2	6	11	3	4	3	3
Waste water	6	6	6	10	10	17	35	20	10	28	24
Other substances	13	9	4	2	1	3	7	10	8	6	7
Water detrimental substances impossible to determine	17	7	12	9	7	17	35	14	10	22	26

Source: SEI

In 2007, no emergency deterioration of water quality outside the Slovak territory was recorded. Unknown originators (30.6 %) and so-called foreign organisations (10.8 %) represent stable contributors to emergency deterioration of water quality.

Just like in the previous years, in 2007, 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 (50) and transfer of hazardous substances (4).

Accidental deterioration of air quality

In 2007, Air Protection Inspectorate Division of SEI, recorded only one event that caused deterioration in air quality.

Summary of the major events (accidents) leading to exceptional deterioration or threatening of air quality in 2007

Year	Date	Place of occurrence, object	Cause of accident	Aftermath of accident
2007	24.03.07	SLOVALCO, Ltd. Žiar nad Hronom Anódka – AN operation	Fire caused as consequence of increased temperature of flues in the pipeline of the kiln	Excessive escape of emissions into the atmosphere SO_2, NO_x, PM, CO,F, HF, tar

Source: SEI

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.

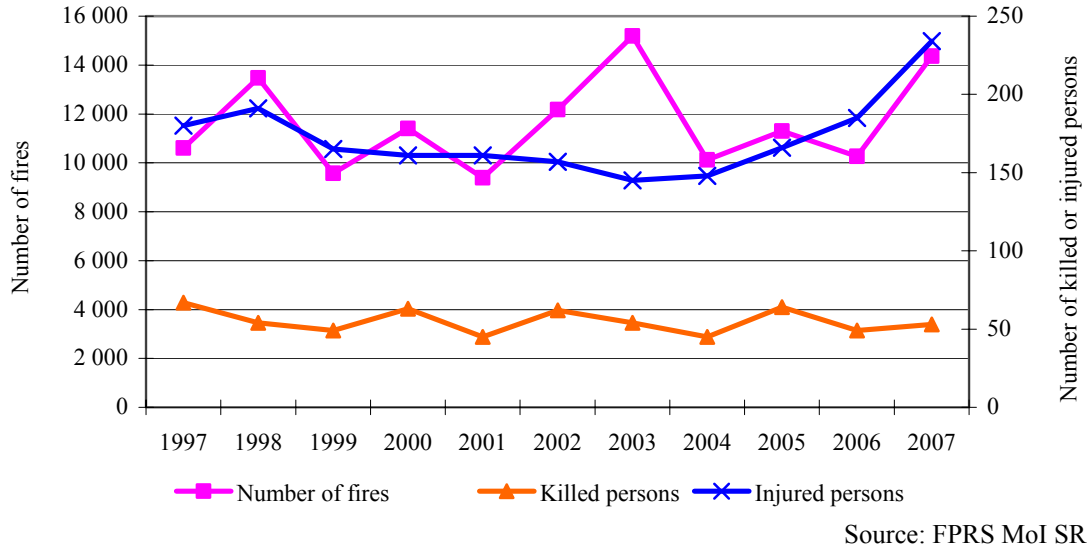
Fire risk

In **2007** were documented in the SR **14 366** fires, causing 53 casualties and 234 injured**.** Direct material damage reached 1 413 570.8 thous. SKK, while the volume of preserved values was calculated at 5 515 255 thous. SKK.

In terms of damage cause by fires in individual industrial sectors, **most fires occurred** again **in agriculture** - 3 018, with direct material damage of app. 53.3 mil. SKK, 2 deaths and 7 injured persons. **Households** occupy the second place in fire statistics by number of occurred fires, with 2 048 fires killing 37 people, and 169.2 mil. SKK in direct material damage. Least number of fires was recorded in the **trade** sector, with 133 fires, and 24.2 mil. SKK in direct material damage.

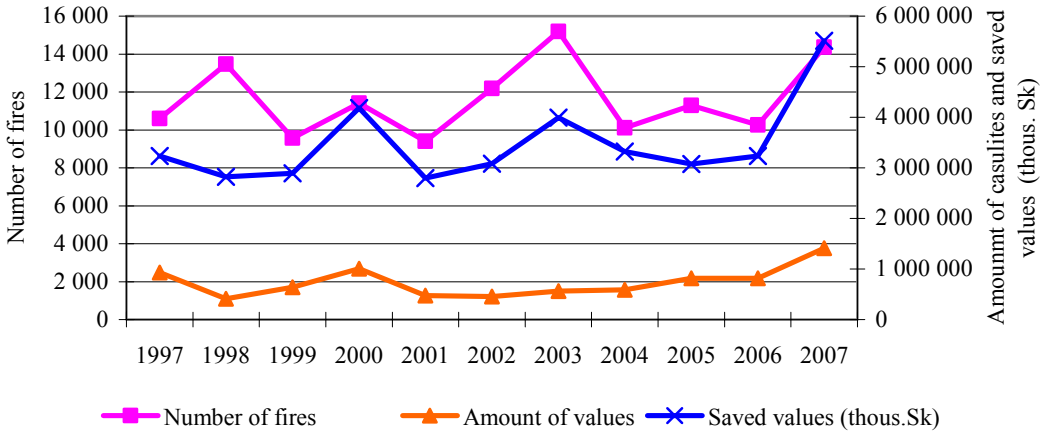
From the perspective of administrative distribution of territory, **most fires** occurred in 2007 in the Košice region (2 872), while **least** fires were recorded in the Trenčín region (1 079). **Greatest damage** due to the occurrence of fires was recorded in the Žilina region (45 715.4 thous. SKK) and the **least** in the Trenčín region (66 276.5 thous. SKK).

Relationship between number of fires and number of killed or injured persons in 1997-2007



Source: FPRS MoI SR

Relationship between number of fires and number of casualties or amount of saved values in 1997-2007



Source: FPRS MoI SR

Floods

In 2007, there were 60 municipalities affected by floods. 2 277 inhabitants felt the aftermath of the floods, including 37 persons who had to be evacuated.

Total cost and damages by floods in the SR in 2007 amounted to 125.107 mil. SKK, including the rescue costs of 9.137 mil. SKK, and safety works of 3.393 mil. SKK.

Material damage amounted to 74 912 thous. SKK, damage to private citizens' property was 6 792 thous. SKK, and damage to municipal property was 54 900 thous. SKK, damage to higher territorial governing units was 13 220 thous. SKK. Flood prevention construction measures at water courses were damaged, resulting in damages at 34 665 thous. SKK.

Floods aftermath over the period of 1999-2007

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	193.40	2 799.64
2007	60	339	109.58	9.14	6.39	125.11

* including also the sum of 6.0 mil. SKK – cost of anti-mosquito chemical spray treatment Source: MoA SR, MoE SR

Strategy of the State Environmental Policy *leads to integration of the Slovak Republic as an independent state into the global alliance, which creates precondition of achieving the European and global environmental safety, peace and sustainable development and life on Earth ...*

from the document on State Environmental Policy Strategy from 1993

ENVIRONMENTAL CARE

• ENVIRONMENTAL LAW

Collection of Laws of the Slovak Republic published the following legislation in 2007: 10 acts, 7 Ministry of Environment resolutions, and 1 announcement on Ministry regulation.

Acts

- Act **117/2007 Coll.,** which amends Act 572/2004 Coll. on trade with emission quotas and on amendment to other laws as amended by Act 733/2004 Coll.
- Act **203/2007 Coll.,** which amends Act 47/2002 Coll. on air as amended
- Act **217/2007Coll.,** which amends Act no.469/2002 Coll. on environmental product labelling
- Act **276/2007Coll.,** which amends Act no.587/2004 Coll. on Environmental fund
- Act **332/2007Coll.,** which amends Act 666/2004 Coll. on flood protection
- **Act 359/2007 Coll.** on prevention and recovery of environmental damage, and on amendments to other laws
- Act **452/2007 Coll.,** which amends Act 15/2005 Coll. on protection of wildlife animal and plant species through regulating their trade, and on amendments to other laws as amended by Act 672/2006 Coll.
- Act **454/2007Coll.,** which amends Act 543/2002 Coll. on nature and landscape protection as amended
- Act **529/2007 Coll**., which amends Act 478/2002 Coll. on air protection, amending Act 401/1998 Coll. on air pollution fees as amended (Air Act) as amended, and which amends Act 401/1998 Coll. on air pollution fees as amended
- Act **569/2007 Coll.** on geological works (Geological act).

MoE SR Regulation

- MoE SR Regulation **227/2007 Coll.,** which amends Ministry of Environment Regulation 125/2004 Coll. outlining details on processing of old vehicles and on certain car manufacture requirements
- MoE SR Regulation **313/2007 Coll.,** which amends Ministry of Environment Regulation 208/2005 Coll. on handling electrical appliances and electro-waste
- MoE SR Regulation **351/2007 Coll.**, which amends MoE SR Regulation 705/2002 Coll., on air quality
- MoE SR Regulation **411/2007 Coll.,** which executes Act 205/2004 Coll. on collecting, storing, and spreading information on environment, and on amendments to other laws
- MZ SR Regulation **457/2007 Coll.** which amends the MoE Regulation 409/2003 Coll. which sets forth emission limits technical requirements and general requirements for the operation of sources using organic solvents as amended by Regulation 132/2006 Coll.
- MoE SR Regulation **631/2007 Coll.,** which amends MoE SR Regulation 706/2002 Coll., on sources of air pollution, emission limits, on technical demands and general operation conditions, on the pollutants register, on categorizing of air pollution sources, and on the requirements to ensure dispersion of pollutants emissions as amended
- MoE SR Regulation **638/2007 Coll.**, which amends MoE SR Regulation 24/2003 Coll. which executes Act 543/2002 on nature and landscape protection.

MoE SR Announcement

- Announcement of MoE SR **178/2007 Coll.** of March 20, 2007 on issuing an order 1/2007, which amends a MoE SR Decree 5/2005 of November 16, 2005 on subsidies to municipalities to cover costs for delegated execution of state administration environmental care.

Environmental impact assessment is a comprehensive identification, description and evaluation of the likely environmental impact of a strategic document and a proposed activity…

§ 3 b of the Act No. 24/2006 Coll. on environmental impact assessment and on amendment to other laws

• ENVIRONMENTAL IMPACT ASSESSMENT

In 2007, MoE SR implemented the EIA process, assessing 236 constructions, facilities, and other activities. These activities included those with an ongoing obligatory assessment process that terminated by an issued final position statement pursuant to Act 24/2006 on environmental impact assessment and on amendment to other laws, and in cases of assessment processes that began before February 1, also pursuant to the SR National Council Act 127/1994 Coll. on environmental impact assessment. In 2007, there were 176 final position statements issued at the MoE SR.

Within the SEA process, MoE SR continued to assess strategic documents that may have a major impact on environment that extends beyond national borders, as well as strategic documents applicable to the whole state's territory. 18 strategic documents were assessed within the assessment period.

Assessment of strategic documents pursuant to Sect.4 and Sect.7 of Act 24/2006, as well as proposed activities under Sect. 29 of Act 24/2006 (finding proceedings) was implemented also by local and regional environmental authorities.

Outcomes of the EIA process in 2007 – the MoE SR level

Number of assessed buildings and activities at MoE SR - EIA	251
Number of decisions issued at MoE SR	133
Number of final positions issued	118
Number of assessed drafts of strategic documents - SEA	16

Source: MoE SR

Outcomes of the EIA process in 2007 – the environmental authorities level

Number of decisions issued by regional environmental authorities and district environmental authorities	428
Number of assessed drafts of strategic documents - SEA	79

Source: MoE SR

MoE SR keeps the **central register** of all assessed strategic documents and proposed activities (in electronic form) as the commissioned authority on behalf of the SR, in cooperation with Slovak Environmental Agency, using the information system for environmental impact assessment in Slovakia. For all available information, go to http://eia.enviroportal.sk/

Complete documentation (hard copies) from the EIA process of proposed activities carried out and completed by MoE SR since 1994 until 2004 are archived in the **EIA Documentation centre** at Slovak Environmental Agency. Documentation as from January 1, 2005 until the end of 2007, is kept at MoE SR. Information from the documentation may be requested from SEA and MoE SR.

Documentation of the processes carried out by regional and local environment agencies is archived at individual authorities.

Integrated pollution prevention and control is a set of measures aimed at a pollution prevention, reduction of emissions to air, water and soil, reduction of waste generation and at waste recovery and disposal in order to achieve a high level of protection of the environment taken as a whole.

§ 2 par. 1 of the Act No. 245/2003 Coll. on integrated pollution prevention and control

• INTEGRATED POLLUTION PREVENTION AND CONTROL (IPPC)

IPPC was introduced into the Slovak legal codes and implemented through **Act 245/2003 Coll. on integrated environmental pollution prevention and control and on amendments of certain laws as amended (Act on IPPC)**.

In March 2008, came into force a MoE SR Resolution 63/2008 Coll., which amends Resolution 391/2003 Coll., amending Act on IPPC, and which regulates the process and form of acquiring a certificate of professional training to offer professional counselling in the area of IPPC. The Resolution also specifies the data to be acquired and notified by the IPPC operators before February 15 of each year into the integrated information system register.

Slovak Environmental Inspection is the administration authority in the process of integrated licensing and issuing of integrated licenses. As of December 31, 2007, 510 valid integrated licenses were issued for existing and new operation sites.

The system of integrated environmental pollution prevention and control has been developed to ensure a complex collection of data and information on the IPPC. The system includes: Register of operators and IPPC operations, Register of issued integrated licenses, Integrated register of information system (IRIS), Register of environmental quality norms, BAT and BREF Register, and the Register of authorised persons.

New EP and Council Regulation (EC) 166/2006 **concerning the establishment of a European Pollutant Release and Transfer Register entered into effect in January 2006, which will substitute and extend the actual European Pollutant Emission Register (EPER)**. First duty to report, as dictated by E-PRTR, is for the calendar year of 2007.

Environmental damage *is a damage inflicted on*

- *protected species and protected biotopes, and which shows critical adverse impacts on reaching or sustaining favourable conditions in the protection of protected species and protected biotopes, with the exception of the previously-identified adverse impacts that aroused as a consequence of the operator's actions that the operator was entitled to perform in compliance with special provisions,*
- *water, which shows adverse impacts on ecological, chemical, or quantitative conditions of water, or on aquatic ecological potential, with the exception of adverse effects set forth by special provisions, or*
- *soil, where the damage represents soil contamination that poses a major risk of adverse impacts on health, caused either by direct or indirect introduction of substances, products, organisms, or microorganisms to soil, into soil or below the soil's surface.*

Act No. 359/2007 Coll.

• PREVENTION AND REMEDYING ENVIRONMENTAL DAMAGES

In 2007, Slovak Republic included in its legislation an EP and Council Directive 2004/35/EC on environmental liability with regard to the prevention and remedying of environmental damage (hereinafter only „directive") through its **Act No. 359/2007 Coll. on the prevention and remedying of environmental damage and on amendment to other laws**.

Presently, in the EU there are many contaminated cities that pose major health risks. Over the last decades, the loss of biodiversity has dramatically accelerated. Absence of any activity might result in a greater municipal contamination and a greater future loss of biodiversity. Prevention and elimination of environmental damage represents the greatest contribution to the implementation of objectives and principles of the Community's environmental policy, as stated in the European Union founding treaties.

Prevention and elimination of environmental damage should be implemented through the „**polluter-pays**" rule, in compliance with the principle of sustainable development. Fundamental principle of the directive that is also reflected in the corresponding law requires the operator whose activities occasioned environmental damage or pose an imminent threat of such a damage, to be considered financially liable. The objective is to force the operators to adopt and execute measures and strategies to minimize environmental damage, as this would reduce their financial liability risk.

The law considers **environmental damage** as only **damage to protected species and biotopes, on water and on land**, rather than any damage to environment. Nevertheless, any adverse change to any of the mentioned natural resources is considered damage, regardless of whether such was caused by breaching legal provisions or by acting in compliance with them. Operators carrying out work activities defined by legislation are liable for such environmental damage. This is the case of objective

liability, while the operators involved in other work activities fall under subjective liability pertaining only to the damage on protected species and biotopes.

Information system of the prevention and remedying of environmental damage was implemented.

A major industrial accident involves an event such as excessive emission level, fire or explosion with the presence of one or more selected hazardous substances, which results from uncontrolled developments in operation of any business eligible under this law, and which leads to immediate or consequent hazard to life or health of the public, environment, or property inside or outside the business.

Sect. 2(h) of Act No. 261/2002 Coll.

• PREVENTION OF MAJOR INDUSTRIAL ACCIDENTS

Prevention of major industrial accidents is regulated through the following legislation:

- Act No. 261/2002 Coll. on prevention of major industrial accidents and on amendments to other laws as amended (hereinafter only the Accident Act),
- Resolution No. 489/2002 Coll. which executes several provisions of Act No. 261/2002 Coll. on preventing major industrial accidents and on amendments to other laws as amended,
- Resolution No. 490/2002 on safety administration and on emergency plan as amended.

Unexpected, sudden emergencies, especially major leakages of hazardous substances, fires, explosions, that could occur especially in the chemical industry as a consequence of extraordinary causes or mishandled production procedures, represent a major hazard not only to workers of the given facility, but also to the public and to the environment. Qualified prevention, above all, plays the fundamental and irreplaceable role in fighting the occurrence of such events.

Act on accidents introduced a complex programme of prevention and accident preparedness. The Act fully embraces one of the key EU directives in the area of industrial pollution and risk management – Directive 96/82/EC on the control of major-accident hazards involving dangerous substances, the so-called SEVESO II Directive.

Act on accidents divides businesses by total volumes of selected hazardous substances present in the plant into **A category and B category (so-called SEVESO businesses).** At present, there are **37 A-category businesses** and **39 B-category businesses** under the pertinent law.

Basic obligations of business operators with present selected hazardous substances include:

- to revise total volumes of selected hazardous substances in the plant and subsequently classify the business into a pertinent category,
- to issue a report on registration of the business by local district environmental authority.

Business registered under a given category should:

- appoint a qualified person,
- develop a programme of prevention of major industrial accidents and introduce safety control system,
- develop risk assessment and safety report,
- develop an emergency plan,
- inform the public,
- engage rescue service,
- make agreement on liability insurance,
- submit documentation for developing a public safety plan.

Information system of prevention of major industrial accidents for public together with authorised version for competent organs was put in practice.

Register of qualified persons in 2006 included **219 professionals in the area of prevention of major industrial accidents** and **29 emergency technicians.** The list of authorised persons in 2006 included **34 subjects.**

In **2003-2007,** the MoE SR registered **18 immediate hazards of major** industrial accidents and **3 major industrial accidents.** Information on major industrial accidents was supplied to JRC EC in Ispre and is stored in the MARS database (Major Accident Reporting System). This database stores information on major industrial accidents in EU.

Overview of reported events for individual years of 2003-2007

	2003	2004	2005	2006	2007
Imminent hazard of major industrial accident	7	4	1	1	5
Major industrial accident	0	0	2	1	0

Source: MoE SR

Genetic technologies *shall be activities of genetic engineering and modern biotechnology, which create and use live genetically modified organisms including micro-organisms.*
Genetically modified organism *shall be an organism, of which genetic material has been altered in a way that does not occur naturally by sexual reproduction and natural recombination.*

§ 2 par. 1and § 4 par. 1 of the Act No. 151/2002 Coll. on use of genetic technologies and genetically modified organisms

• GENETIC TECHNOLOGIES AND GENETICALLY MODIFIED ORGANISMS

The area of using genetic technologies and genetically modified organisms (GMO) within the Slovak legal code is addressed by the **Act No. 151/2002 Coll. on the use of genetic technologies and genetically modified organisms as amended by the Act No. 587/2004 Coll., and the MoE SR Regulation 399/2005 executing this Act as amended by Regulation 312/2008 Coll.**.

The law makes it possible to use genetic technologies and genetically modified organisms in three ways:

- in enclosed areas (devices),
- intentional release, including a) introduction to the environment,
  b) introduction to the market.

♦ **Using of genetic technologies and genetically modified organisms in vitro**

Plans the use of genetic technologies and genetically modified organisms in enclosed areas (laboratories, greenhouses, cultivating rooms, and other enclosed facilities) is divided into four at risk categories (RC), while the RC 1 represents no or negligible risk, RC 2 means small risk, RC 3 means medium risk, and RC 4 means significant risk.

On the basis of received applications and notifications by the MoE SR in 2007, 39 facilities were entered into the register of facilities. License was given to 16 facilities for their first use of genetic technologies, while 3 facilities were given the permission to initiate the RC 2 activities. MoE SR did not object to commencement of activities in RT in 78 facilities.

♦ **Intentional release**

In 2007, MoE SR issued 1 permit for test cultivation of genetically modified corn.

♦ **Biological safety commission**

Commission for the biological safety (commission) is the professional consulting body to the Ministry of Environment of the SR in the area of biological safety. The Commission consists of a broad spectrum of professionals, scientists, public officers nominated to represent the affected resorts, representatives of the public including the users (producers, importers, salespersons, etc.), and the general public. The Commission cooperates with the Association of experts.

In 2007, there were 15 sessions of the commission. At the mention sessions, the Commission commented on the statements adopted by the EU, proposals to issue licenses for the first use of the facilities for genetic technologies, and on the notification reports on launching of operations in facilities.

Eco-label *is a label, which on the basis of a legally specified verification certifies, that a particular product meets requirements above the standard from the point of environmental protection, when compared with other products of the same group of products.*

§ 2 par. 2 of Act No. 469/2002 Coll. on Environmental eco-labelling

• ENVIRONMENTAL ASSESSMENT AND PRODUCT LABELLING

Conditions and strategy for licensing and using the national label "*Environment-friendly product*" (EFP), as well as the EC environmental label „*European Flower*" are governed by the **Act No. 469/2002 Coll. on environmental product labelling as amended by Act No. 587/2004 Coll.**. The MoE SR Directive No. 258/2003 Coll. was subsequently adopted, which executes the Act on environmental product labelling. With the goal to ensure reduction of negative impacts of the products on the environment, the **Program of environmental product labelling for the years 2004-2008** was adopted in 2004. The Programme aims to apply the environment creation and protection aspects into product strategy, through implementation of the environmental tender criteria.

NPEHOV regulations represent the basic technical document of the *National Programme of Environmental Assessment and Product Labelling in the SR*, which carries out attestation of product conformity with the basic and specific environmental requirements, with the objective to obtain the national environmental label (EFP). In 2007, 13 products received national environmental label "EFP". Since 1997, 144 products received national environmental label "EFP".

Act No. 217/2007 Coll. of March 29, 2007 which amends Act No. 469/2002 Coll. on environmental labelling of products as amended by Act No. 587/2004 Coll. effective as from June 1, 2007 *in its full text including the annexes and legal provisions accentuates the word "product".*

Environmental management is a set of voluntary instruments of environmental policy that enable implementation of a systematic approach to solution of issues regarding protection and planning of the environment as well as increase of environmental-friendly behaviour of companies by the application of eco-innovation trends.

• ENVIRONMENTAL MANAGEMENT AND AUDIT

Scheme of the European Community (EC) for **environmental management and audit (EMAS)** is a voluntary instrument of the EU that testifies to the fact that organizations base their environmental behaviour on consistent work.

Legal regulation of EMAS stems from the following documents:

- European Parliament and Council Directive 761/2001 of March 19, 2001, which allows for voluntary involvement of organisations within the ES scheme for environmental management and audit (EMAS) in its application acts,
- Act No. 491/2005 Coll. on environmental inspection and registration within the European Community scheme for environmental management audit, and on amendment of certain laws,
- Directive No. 606/2005 Coll., which executes Act No. 491/2005 Coll. on environmental inspection and registration within the European Community scheme for environmental management and audit, and on amendment of certain laws.

In the course of 2007, other two organisations complied with conditions for the EMAS registration. These subjects are active in the area of mechanical production - INA Kysuce, Inc., Kysucké Nové Mesto, and INA Skalica, Ltd., Skalica.

Environmental management system (EMS) pursuant to STN EN ISO 14001 was introduced in other 108 organisations over the course of 2007. This increased the number of registered functional environmental management systems in Slovakia as of December 31, 2007 to 462.

Environmental goals, set for reaching good condition of surface waters and for good condition of underground waters must be secured by implementation of programme of arrangements, which are specified in the plan of watercourses management by 31 December 2015.

§ 16 par. 1 of the Act No. 364/2004 Coll. on Water Sourses, changing and amending some laws (Water Act)

• ECONOMICS OF ENVIRONMENTAL CARE

State budget and investment policy

Funds that pertain to environmental protection and development were released from the state budget of the Slovak Republic through subsidies from budget chapters at different Ministries and from the Environmental Fund.

Environmental investments of some government departments of SR financed from the state budget in 2007 (thous. SKK)

Department	WWTP Sewages	Other WM actions	Waste manage-ment	Air Protection	Others	Total	%
MoE SR	1 499 377	430 400	331 743	379 670	84 159	2 725 349	84,9
MoA SR	0	0	0	0	15 500	15 500	0,5
MoEd SR	4 702	56 271	15 290	28 118	19 278	123 659	3,9
MoTPT SR	104 816	931	3 376	208	29 569	138 900	4,3
MoFA SR	0	0	0	0	0	0	0
MoCRD SR	49 201,4	62 645,5	70 005,1	682,8	24 602,3	207 137,1	6,5
Total	**1 658 096**	**550 248**	**420 414**	**408 679**	**173 108**	**3 210 545**	**100**

Source: Proper resorts

During the period 1993-2007, Ministry of Environment SR designating the sum of 18.6 billion SKK to environmental investments, the Ministry of Agriculture designated the sum of 8.1 billion SKK, and the Ministry of Defence of the Slovak Republic designated the sum of 2.01 billion SKK. **Total environmental investments** for the period 1993-2007 in Slovakia represent the sum of **37.3 billion SKK.**

Budget grants determined on realization of environmental programs

The environmental fund was established on January 1, 2005, through **Act No. 587/2004 Coll. on environmental fund and amendment to certain laws.**

Review of financed grants in 2007

Area of budget grants	Number	SKK
Protection of air and of ozone layer	29	40 157 980
Protection and rational efficiency of water	368	1 454 737 483
Including: - WWTP and sewers	226	1 005 716 814
- water lines	127	398 259 669
- anti-flood measures	15	50 761 000
Development of waste management	79	207 298 000
Protection of nature and lands	24	35 708 850
Environmental education and promotion	40	73 455 347
Survey, research and development	11	79 033 709
Accidents	2	3 273 700
Total	**553**	**1 893 665 069**

Source: Environmental fund

Of total number of awarded loans in the sum of 140 199 356 SKK, 49.9 % was awarded to the development of waste management, 43.6 % to the protection of atmosphere and the Earth's ozone layer, and 6.5 % to the protection and rational use of water.

Economic tools

- **Fees for pollution and exploitation of natural resources**

In 2007, the greatest portion of fees for pollution of environment came from air pollution fees (1.166 bill. SKK).

Gains from selected economic tools exercised in 2007 (thous. SKK)

Sort of payment	2007
Charges for pollution of air	1 166 532
Retributions for tapping of waste water	355 015
Charges for loading of wastes	88
Penalisation for the failure to pay air-pollution fees.	2 292
Charges for exploitation of natural resources	
Retributions for taking of subterranean waters	407 201
Settlements for yielding spaces	20 928
Settlements for mined minerals	145 595
Settlements for loading of gases and liquids in natural rocky-structures and subterranean places	36 798

Source: Environmental fund

- **Fines imposed by the State administration environmental authorities**

State administration environmental authorities impose fines for non-compliance with the provisions set forth under generally binding legal policies.

Penalties laid by executive administration for the environment during the period of 1993-2007 (thous. SKK)

Sector	1993	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Protection of air	9 693	3 771	2 334	1 644	2 220	6 176	1 847	4 328	6 016	3 545	2 564
Protection of water	12 635	7 850	6 733	6 038	8 887	5 858	8 030	9 540	10 603	14 832	12 679
Wastes	5 894	8 659	7 012	9 213	9 269	3 743	6 129	7 899	6 994	9 635	9 813
Protection of nature	662	1 893	1 659	1 498	1 581	3 532	1 255	1 421	1 607	2 703	3 227
Penalization			692	417	4 244	1 357	353	553	192	0	0
Building law				1 091	5 671	7 135	3 716	917	469	245	0
Packaging							5	2	1	310	0
Prevention of gross industrial averages							4	7	31	226	0
Trading with endangered species of animals and plants							43	73	81	160	0
Public water-supply and sewages									1	0	0
Integrated prevention and control									125	284	1 440
GMO									150	50	3
Geological works									5	0	0
Fishery										3	0
Total	**28 884**	**22 173**	**18 430**	**19 901**	**31 872**	**27 801**	**21 382**	**24 740**	**26 275**	**17 161**	**29 726**

Source: MoE SR

In 2007, the greatest sum of fines was imposed in the area of water protection (12.679 bill. SKK) and in the area of waste management (9.813 mil. SKK).

Environmental gains and expenses

Financial indicators of environmental protection in Slovakia are systematically monitored by the Statistical Office of Slovak Republic for 1998-2007, both as investments – common internal company expenses and yields for protecting the environment, and as expenditures of individual budget chapters.

Environmental gains and expenses according to contemporary way of statistical showing, during the period of 1998-2007 (thousand SKK)

Domain of gains and expenses	1998	2000	2001	2002	2003	2004	2005	2006	2007
Investments on protection of environment covered from state sources	1 221 075	899 167	1 195 411	1 070 774	891 491	797 000	1 027 000	1 143 000	858 000
Investments on protection of environment covered from foreign sources	7 008 421	377 289	133 748	2 164 044	328 000[1)]	135 000[1)]	802 000[1)]	1 638 000[1)]	1 594 000[1)]
Current costs of protection of the environment	7 036 448	6 666 920	9 209 273	11 485 181	11 389 498	13 886 000	15 100 000	23 277 000	17 452 000

Intradepartmental disbursement– wage	434 349	508 619	612 137	842 778	877 277	912 000	1 068 000	1 111 000	1 020 000
Intradepartmental disbursement – other	3 188 770	3 083 225	4 892 388	5 579 150	5 290 254	4 849 000	5 373 000	13 460 000	4 561 000
Disbursement of organization on protection of the environment covered by other subject Charges and payments to public organs and organizations	2 464 240	2 253 695	2 653 205	2 919 064	2 991 248	1 492 000	4 345 000	4 033 000	6 059 000
Payments to private person or organizations	949 089	821 381	1 051 543	2 144 189	2 230 719	6 631 000	4 314 000	4 673 000	5 811 000
Profits from the protection of the environment Sales from selling of products, tools and components	610 971	641 788	659 868	709 743	106 022	111 000	52 000	65 000	85 000
Sales from selling of technologies	509	1 882	16 116	1 100	30	0	0	13 000	5 000
Sales from provided services	328 985	307 421	477 601	1 056 806	1 497 401	4 497 000	5 613 000	4 506 000	5 758 000

[1)] without expenses of municipalities

Source: SO SR

Enlightenment activities *increase the general cultural and awareness and educational level of people by... improving their relationship with their own state, and towards the* ***environmental care.***

§ 2 par. 2 of the Act No. 61/2002 Coll. on Enlightenment Activities

• SCIENCE, RESEARCH AND ENVIRONMENTAL EDIFICATION

Science and research

Research endeavours in 2007 carried out by professional organisations within the sector focused on the following:

SGI DS addressed numerous aspects of environmental geological survey and research. This especially included regular monitoring and evaluation of the mechanism of negative changes to the geological space, within the partial monitoring system of geological environmental factors. Continuing issues focused on the creation of a set of geological factor environmental maps in the scale of 1 : 50 000 in selected Slovakia's regions. The project of Geological maps development 1: 50 000 for the needs of integrated landscape management was studied extensively.

In 2007, besides other scientific and technical projects, **WRI** also focused on the project of SZIGETKOZ - Implementation of new approaches for sustainable management of water and landscape of the Hungarian-Slovakian territory (LIFE Programme), Zemplínska aquatic route (INTERREG III.A), and EnviroGeoPortal (INTERREG III.A).

In 2007, **SEA** also addressed the EnviroGeoPortal project and participated in the project funded by the 6th framework programme of GNU - network of GMES users (Global environmental and safety monitoring) coordinated by the Austrian Environmental Agency.

Research and development activities of the **SHMI** in 2007 again focused on applied research. Results of the activities contributed mainly to the protection of aquatic sources and atmosphere, and to the continuous assessment of climatic system and its impacts on the hydrosphere especially. For SHMI, the year 2007 meant creation of an agreement on cooperation with the European Centre for Medium-Range Weather Forecasts. (ECMWF) Objective of the input is to improve weather forecasts that represent a major contribution in terms of flood aftermaths prevention or crisis management activities.

In the area of nature and landscape protection, **SCA** carried out various tasks and projects of basic and applied research, such as inventory survey of caves, geological and geo-morphological research, bio-speleological research of invertebrates.

State Nature Conservancy (SNC SR) conducted partial count of big predators in selected areas in order to determine their numbers. It mapped introduced and invasive species of plants, plants of European significance, animals, bogs, wetlands.

SMNPaS workers implemented an inventory survey of proposed European significance territories. Other research activities focused on marmot colonies, and bio-indicative species of malaco-fauna.

Research at the **Bojnice ZOO** focused on the protection of species and their raising by humans.

Environmental research and monitoring at **SAS** in 2007 continued through the following projects: VEGA, 5.- 6. framework programme of the EU, SRDA, COST, UNESCO, etc.

MoE SR and SAS cooperated at creating a representative monograph titled Landscape Ecology in Slovakia. Besides, their cooperation involved genetically-modified organisms, monitoring of seismic phenomena in the Slovak territory, etc.

Green Project

The **"Green Project"** grant scheme is one of the possibilities for specific financial assistance to environmental activities carried out by non government organizations. Therefore, green projects represent the functional instrument that helps to increase the level of environmental awareness among the general public.

Since the „Green Project" competition was first announced, 220 projects have been supported in this way. In 2007, released funds within the programme reached 371 500 SKK.

Environmental edification

Major activities in 2007 included for example:

Presentations and exhibitions

- Enviro Nitra 12.04. – 15.04. 2007
- Recycling – Innovation - Separation Banská Bystrica 24.-27. 04. 2007
- AQUA Trenčín 19.06. – 21.06. 2007

Conferences, seminars, lectures, training sessions

In 2007, MoE SR in cooperation with professional organisations within the sector organised a number of events for professionals and general public alike:

- Reclamation technologies of biological waste within the municipal sphere
- Environmental loads
- 12. professional seminar for workers of accessed caves
- Hydrochémia 2007 – New analytical methods in water chemistry
- World Water Day – Water and culture
- NATURA 2000 – size of protected territories, problems related to the declaration process, approaches to address the economic damage in favour of limitation of private owners' activities.
- Recycling industry - condition, problems, and perspectives
- Enviro-i-forum
- Environmental policy and industrial development of the SR
- First places of the Slovak mineral world
- Day of the Earth's Ozone Layer protection
- 15. anniversary of completing Danube's dams
- World day of animal protection
- Landscape – an undervalued thing
- Conference to commemorate the 75th PIENAP anniversary
- Conference to commemorate the 30th anniversary of the Slovenský karst BR
- Research and protection of mammals in Slovakia VIII
- Declaration of tri-lateral trans-boundary ramsar site Niva (river flat) at the confluence of Morava, Dyje, and Danube.

Festivals, competitions, films, and projects for the public

- ENVIROFILM 2007
- International Danube Day 2007
- Festival of folk creativity, crafts and fun
- CAP Á Ĺ EST
- Štiavnica Christmas Fair
- Hypericum – physical wellness and educational competition for the youth
- Children to nature
- Fair of environmental educational programmes – Šiška (cone)
- Envirootázniky (enviro-questions) – Olympics on environment
- ProEnviro
- Vodný svet (Water world) summer camp
- Summer eco-camp
- Project "School in the Museum" (SMM)
- Living Gallery Project (SMM)

Publication activity

Major periodicals published in the sector of environment in 2005 included the MoE SR Journal, Enviromagazine magazines, Aragonit, Mineralia Slovaca, Slovac Geological Magazin, Protected areas of Slovakia, Protection of the Slovak Nature, Water management bulletin, publications of the State of the environment report, Water in the Slovak Republic, Slovak Karst Journals, Naturae Tutela, Sinter bulletin, ZOO news.

Besides these periodicals, the edition plan included annual reports, journals from various events, educational methodological workbooks, taxonomic identification guides for plant and animal species, advertisements and educational brochures, posters, pamphlets, cave guides, maps.

A bilingual document called **Environment in Slovakia** was published in 2007, with the aim to present the work and mission of the Ministry, legal situation, and its trends in the area of environmental protection and creation.

The Zelená šanca (Green chance) edition included a number of created promotional and educational films shown on the public television.

Environmental Law and Access to Information

In 2007, on free access to information and amendment to certain laws according to **Act No. 211/2000 Coll.**, were registered 3 728 applications. Greatest number of registered applications submitted by the public came through the „Green Line“. Direct telephonic conversation were registered through 2 511 applications, 87 applications were sent in by mail and subsequently registered, 3 proposals were faxed, and 990 applicants were sent by electronic mail. 127 personal inquires have been processed directly by the public office.

Human kind is a part of the nature *and life depends on undisturbed functioning of nature systems, which provide for resources of energy and nutrition,... Permanent benefit from the nature depends on maintenance of basic ecological processes of vitally important systems, from* ***diversity of life forms,*** *which are threatened by extreme exploitation and destruction of areas from the man's side.*

The World Chart on Nature, adopted by the UN General Assembly on 28 October 1982

INTERNATIONAL CO-OPERATION

• INTERNATIONAL CARE OF THE ENVIRONMENT

Cooperation of the Vysegrad group

Ministers of environment of the Czech Republic, Hungary, Poland, and Slovakia met in Prague in May 24-25, 2007 for the 14th time. The meeting focused on climatic changes, framework directive on waste, coordination of environmental policies, and the preparation of a conference of Ministers of environment of the UN EEC organized in the Fall of 2007 in Belgrade.

Bilateral cooperation

Bilateral cooperation with the neighbouring countries including the Czech Republic, Poland, Hungary, and Austria focused primarily on the cooperation between border regions on programming and implementation of common projects with funding from the EU programmes.

Equally intensive were activities of mixed committees and taskforce groups for cooperation with the mentioned countries in the area of border waters.

Multiteral cooperation

The 6th ministerial conference called „Environment for Europe" organized in October 10-12, 2007 in Belgrade hosted 2000 delegates from 51 member countries of the UN European Economic Commission, together with European Commission, international organisations, non-government organisations, financial institutions, regional environmental centres, and civic organisations. Major topics of the conference centred on evaluation of activities and their implementation, building of

capacities, and the future of the Environment for Europe process. There also were other 60 accompanying events organised besides the main programme. Representatives from the Slovak Ministry of Environment were directly involved in an UN EEC event called "Assessing the state of trans-boundary water bodies within the UN EEC region“, and also participated directly in an event organised by the International Commission for the Protection of the Danube River addressing the Tisa river watershed.

Coordination of the SR activities toward the EU in the area of environment

Coordination of the SR strategy toward the EU in the area of environment is supervised by the MoE SR. The highest decision making authority to adopt legal steps and political documents at the EU level for environmental issues is the EU Environment Council, with the Slovak Minister of Environment as a member. Besides its regular meetings, the presiding country usually organises also an informal council of ministers of environment in its own territory. In total, there were 6 meetings, which included 4 formal meetings (20.2. and 20.12.2007 in Brussels, and 27.6. and 30.10. 2007 in Luxembourg).

In 2007 continued the process of transposition and implementation of the effective EU legal acts in the area of environment. The following environmental **legal instruments** were adopted in the EU for the monitored time period: 1 regulation, 3 directives, and 5 decisions.

The year 2007 was the 1st year of a new programming period in terms of using the EU funds within the Cohesion fund and Structure Funds for the period of 2007-2013. In June 2007, works on the document called **"Condition and future possibilities for the implementation of acquis for the period of 2007-2013"**were successfully completed. This was one of the key elements in the process of preparation and approval of the Operation environment programme.

Measures of the economic policy and other measures shall be designed to implement economical and social development of the Slovak Republic, and they will follow the principle of sustainable development. These measures should provide from the very beginning, that ***also aspects of environmental protection shall be fully taken into consideration*** *and that they shall be connected to the requirements of a harmonic social development.*

Article 72 par. 2 of the European Affiliation Agreement, signed between the European Union and its members on one side and the Slovak republic on the other side (Luxembourg, 4 October 1993)

• PROGRAMMES AND PROJECTS OF INTERNATIONAL CO-OPERATION

PHARE - National Programme

- **PHARE – Twinning, Twinning light**

In 2007, in the area of environment, the PHARE Programme continued to focus on strengthening the MoE SR administration. It also supports of the process of approximation of legislation and its application in accordance with the EU requirements. In 2007, there were 4 projects implemented within the PHARE - Transitional fund 2007 scheme. One of these projects terminated in 2007, while the other 3 will terminate in 2008.

TF UIBF 2004/016-764.08.03.01-0007 - Securing the compliance to the information flows requirements on the quality of water bodies in Slovakia, and software strengthening of the recreational purposes water database system - technical assistance	
Partner	SHMI + Deconta, s.r.o.
Total financial volume	199 000 €
State of project	Project terminated 11/2007

TF 2005/017-464.06.01 – Determination of environmental quality norms for water and strengthening of regional and district environmental authorities to implement control and monitoring of water - twinning	
International partner	Italy (Agency for the co-operation of local governments – Torino)
Total financial volume	2,016,400 EUR
State of project	PROJECT UNDER IMPLEMENTATION, PLANNED COMPLETION - JUNE 2008

TF UIBF 2005/017-464.08.01 – Drafting of the national methodology for water quality determination in the valley rivers pursuant to RSV with the use of phytoplankton, and a proposal to monitor phyto-benthos – twinning light	
International partner	Austria (Federal agency for environment)
Total financial volume	120 000 €
State of project	PROJECT UNDER IMPLEMENTATION, PLANNED COMPLETION - JUNE 2008

TF UIBF 2005/017-464.08.01 – Completion of information system for environmental impact assessment – strategic environmental assessment part – technical assistance	
Partner	proIS Ltd.
Total financial volume	147 000 €
State of project	PROJECT UNDER IMPLEMENTATION, PLANNED COMPLETION - JUNE 2008

INTERREG IIIB CADSES

The following **priorities** were determined within the Community Initiative Programme of INTERREG III CADSES (2000-2006) for the programme period of 2000-2006:

Priority 1: Support of sustainable territorial development and social and economic cohesion
Priority 2: Effective and sustainable transportation systems, access to information society;
Priority 3: Support and management of landscape development, natural and cultural heritage;
Priority 4: Protection of environment, management of resources and prevention.

Projects within the INTERREG programme are of supra-national character, and in each project there must be **at least 3 project managers** with financial sharing from different CADSES countries.

MoE SR is a national authority for the SR within the CIP INTERREG IIIB CADSES Community Initiative Programme (hereinafter only „CIP Interreg IIIB CADSES").

In total, within the CIP INTERREG IIIB CADSES Community Initiative Programme **as of December 31, 2007,** on the national level, there were **40 projects** approved with **59 project partners from Slovakia, with total volume of required funding at 6 221 077 EUR.** Of this, **3 856 189 EUR** comes **from ERDF,** and **2 364.25 EUR** represents national co-funding.

GEF – Global Environmental Facility

In the period from 1.7.2006 to 30.6.2010, a new programming period will start for the Global Environment Facility initiative (GEF 4), with the priority areas narrowed down to **climate changes and biodiversity.** For the BIODIVERSITY area, Slovakia was placed in a group of 93 countries with

an average allocation per country at the maximum of 3.5 mil. USD by 2010. In the area of Climate changes, Slovakia was assigned an individual allocation at total volume of 5.7 mil. USD by 2010.

Slovakia has participated within the GEF initiative since 1994. Up to date, 12 projects have been approved, with total subsidies of 22.46 mil. USD, including three that are already completed. Slovak organisations also continue to be part of fourteen international projects, and two other projects are currently in preparation.

GEF Projects in the area of environmental protection

Project	Area	GEF grant	Total costs
		mil. USD	
Protection of biodiversity	biodiversity	2.300	3.17
Strategies to protect biodiversity, action plan, and national administration	biodiversity	0.077	0.077
Grassland of Central Europe – protection and sustainable use	biodiversity	0.750	1.102
Protection, renewal, and rational use of calcareous fens in Slovakia	biodiversity	1.000	2.463
Support in the implementation of the National biological safety framework for Slovakia	biodiversity	0.466	0.605
Reduction of green house emissions through the use of the biomass energy in the north-west of Slovakia.	climate change	0.999	8.343
Elimination of barriers to public lighting reconstruction in Slovakia	climate change	0.995	3.203
National assessment for the development of capacities for global environmental management	more areas	0.200	0.22
Integration of principles and practices of ecological management into landscape and water management in the East-Slovakian lowland	more areas	0.995	4.345
Elimination of ozone layer depleting particles at the production of household refrigerators and freezers	ozone layer	3.500	5.953
Initial assistance to Slovakia to meet the obligations under the Stockholm convention on persistent organic pollutants (POPs)	POPs	0.475	0.475
Initial assistance to Slovakia to meet the obligations under the Stockholm Convention on persistent organic pollutants (POPs)	POPs	10.704	20.778
		22.461	**50.734**

I. Programming period of 2004-2006

European Commission approved the Basic Infrastructure Operation Programme (BI OP) on December 18, 2003. The Programme addresses the objectives of the National Development Plan for the years 2004-2006 for the area of transportation, environmental, and local infrastructure. BI OP outlines areas for applying for financial assistance from the EU structural funds, directly **from the European Regional Development Fund (ERDF).** MoE SR in this period assumed the role of an intermediary under the authority (Ministry of construction and regional development) for BI OP for the Priority 2 – Environmental infrastructure, which is one of its three priorities. Each priority is divided into a number of measures. For the priority 2, the measures include the following:

2.1 Improvement and development of infrastructure for the protection and rational use of water,

2.2 Improvement and development of infrastructure for the protection of atmosphere,

2.3 Improvement and development of infrastructure for waste management, and

2.4 Protection, improvement, and regeneration of natural environment.

Volume of means allocated for individual measures under Priority 2 – Environmental infrastructure for the years 2004-2006

	Allocated means (in SKK) *	**Allocated means (in €)**
Measure 2.1 (water)	**total: 2 215 150 644** ERDF: 1 748 803 130 SB: 466 347 514	**total: 58 293 438** ERDF: 46 021 135 SB: 12 272 303
Measure 2.2 (air)	**total: 1 275 267 384** ERDF: 867 743 110 SB: 407 524 274	**total: 33 559 668** ERDF: 22 835 345 SB: 10 724 323
Measure 2.3 (waste management)	total: **1 174 746 592** ERDF: 829 081 302 SB: 345 665 290	**total: 30,914,384** ERDF: 21 817 929 SB: 9 096 455
Measure 2.4 (natural environment)	**total: 289 820 452** ERDF: 217 365 358 SB: 72 455 094	**total: 7 626 854** ERDF: 5 720 141 SB: 1 906 713

1 Euro = 38 SKK

As of **December 31, 2007,** the MoE SR as SORO for the Priority 2—Environmental infrastructure BI OP, registered **428 applications** for non-refundable financial contribution (NFC)

within **Measure 2.1: 161 applications** for NFC

within **Measure 2.2: 67 applications** for NFC

within **Measure 2.3: 149 applications** for NFC

within **Measure 2.4: 51 applications** for NFC

As of **December 31, 2007,** Minister of Environment **approved 186 applications** for non-refundable financial contribution, on the basis of recommendations from the selection committee (Environmental Project Board). Of this, **186 applications** already showed a **concluded contract** on awarding non-refundable financial contribution.

- within **Measure 2.1: 64** approved applications for NFC in total amount of ERDF and SB **2 468 968 447 SKK**
- within **Measure 2.2: 34** approved applications for NFC in total amount of ERDF and SB **2 078 242 556 SKK**
- within **Measure 2.3: 62** approved applications for NFC in total amount of ERDF and SB **1 599 256 262 SKK**
- within **Measure 2.4: 26** approved applications for NFC in total amount of ERDF and SB **299 409 072 SKK**

MoE SR pursuant to the MoE SR Resolution 2/2006-9 of February 1, 2006 and its annex 1 created a depository of projects for individual measures under priority 2 BI OP. Purpose of the depository was to create a list of applications to which NFC could not be allocated due to insufficient available volume of funds for the corresponding measures. Desired NFC for these applications was at last allocated on the day when the Ministry of Environment called the applicant to the contract on awarding a non-refundable financial contribution.

As of **December 31, 2007, 51 applications** for the Priority 2 – Environmental infrastructure BI OP were added to the depository of projects, specifically including:

within **Measure 2.1: 32 applications** for NFC
within **Measure 2.2: 3 applications** for NFC
within **Measure 2.3: 15 applications** for NFC
within **Measure 2.4: 1 application** for NFC

Calls within the measures 2.1, 2.2, and 2.3 have been closed since May 2006, call within the measure 2.4 have been closed since October 31, 2006.

During the period of 2000-2006, Slovakia was receiving assistance also from the European Community under the **ISPA programme** (Instrument for Structural Policies for Pre-Accession). Given assistance was directed toward reaching a balance with the most costly directives in the area of environment. As of December 31, 2007, this Programme supported 22 large projects in the area of environmental infrastructure building, in total sum of 316 566 370 EUR.

In 2004, in connection to Slovakia's accession to the EU, Slovakia was no longer an eligible applicant for the ISPA programme. This resulted in a reduced programming period, and the resources continued to be allocated under the follow-up **Cohesion fund (CF).** As of December 31, 2007, the Cohesion fund provided funding to 7 projects focused on environmental infrastructure, in total sum of 237 031 181 EUR.

II. Programming period 2007-2013

MoE SR becomes the governing authority for the Environmental Operation Programme (EOP), for the new programming period of 2007-2013. On the basis of experience acquired from the previous period as well as the periods of the pre-accession funds, MoE SR, in cooperation with other sector organisations, developed an EOP that determines the areas of support for the programming period of 2007-2013. Since the approval of the EOP took more time than originally planned, the Programme was approved as late as November 8, 2007. For this reason there were no calls to submit NFC project applications in 2007.

The operation programme will support projects aimed at improving environmental protection through the following priority axes:

Priority axis 1: „Integrated protection and rational use of water"

Priority axis 2: „Flood protection"

Priority axis 3: "Air protection and minimisation of adverse effects of climate change"

Priority axis 4: „Waste management"

Priority axis 5: "Protection and regeneration of natural environment and landscape"

Volume of means allocated to individual Priority axes within the Operation Programme of Environment 2007-2013

	Allocated means (in €)
Priority axis 1: (water)	**total: 1 077 227 136** CF: 915 643 065 SB: 161 584 071
Priority axis 2: (floods)	**total: 141 176 471** CF: 120 000 000 SB: 21 176 471
Priority axis 3: (air)	**total: 211 764 706** ERDF: 180 000 000 SB: 31 764 706
Priority axis 4: (waste)	**total: 570 588 235** CF: 485 000 000 SB: 85 588 235
Priority axis 5:	**total: 59 714 041** ERDF: 50 756 935 SB: 8 957 106

SOUTH EAST EUROPE Operation Programme

(SOUTH EAST EUROPE: JOINTLY FOR OUR COMMON FUTURE)

South-East Europe Programme of supra-national co-operation is part of the new objective – European territorial co-operation for the programming period of 2007-2013. South-East Europe Operation programme (hereinafter only „S-EE OP") was approved by the Commission's decision K(2007) 6590 of 20/XII/2007. Objective of the S-EE OP is to improve the process of territorial, economic, and social integration, support of cohesion, stability, and competitiveness through developing supra-national partnership and joint activities for the matters of strategic importance.

S-EE OP involves 16 countries: Albania, Bosnia and Herzegovina, Bulgaria, former Yugoslavian Republic of Macedonia, Croatia, Montenegro, Greece, Hungary, Moldova, Austria, Romania, Slovakia, Slovenia, Serbia, Italy, and Ukraine.

For Slovakia, the whole of its territory is eligible for this programme. Eligible institutions include national, regional, and local institutions (public institutions, institutions governed by public law, or

institutions governed by private law). Total financial allocation for SR for S-EE OP for the period 2007-2013 represents **9.896 mil. EUR.** Rate of co-funding from ERDF for the project partners from SR is 85 % of total justifiable costs to their activities under the project.

Objectives of S-EE OP will be reached through the following Priority axes:

Priority axis 1 „Facilitation of innovations and doing business“

Priority axis 2 “Protection and improvement of environment"

Priority axis 3 „Improving accessibility“

Priority axis 4 „Development of supra-national synergies for areas of sustainable growth“

Priority axis 5 „Technical assistance for the support of implementation and capacity building"

CENTRAL EUROPE – Operation programme Central Europe

(CENTRAL EUROPE: COOPERATING FOR SUCCES)

Operation programme Central Europe (hereinafter only “OP CE”) was approved by Commission's decisions K(2007) 5817 of 03/XII/2007, which adopts the operation programme "Central Europe", and which is implemented by national, regional, and local institutions from 9 countries, including 8 EU member states (Austria, Czech Republic, Germany, Hungary, Italy, Poland, Slovakia, and Slovenia) and the west border area of Ukraine.

The Programme releases 231 mil. EUR from the European Regional Development Fund (ERDF) to fund justifiable costs of the leading partners and project partners. For Slovakia, the whole of its territory is eligible for this programme. Total financial allocation for SR for OP CE for the period of 2007-2013 represents **9.8 mil. EUR.** Costs of Slovak project partners may be covered from the ERDF funds up to 85 %. The partners must co-finance the remaining part of the costs from their own sources.

Objectives of OP CE will be met through the following Priority axes that are worked out in more detail to show the level of intervention areas.

Priority 1: “Facilitating innovations in Central Europe“

Priority 2: “Improvement of accessibility of Central Europe as well as within it.”

Priority 3: “Responsible use of environment”

Priority 4: “Increasing the competitiveness and attractiveness of towns and regions“

Priority 5: “Technical assistance for the support of implementation and capacity building”

In 2007, there was no call at the supra-national level to submit project applications for non-refundable financial contribution from ERDF. In 2007, there was no preparation of program documents, or created program structures at the European, national, and regional levels.

ALPHABETICAL LIST OF ABBREVIATIONS

ADI	Acceptable Daily Income
AL	Arable Land
AMS	Automated Monitoring Stations
AOT40	Accumulated Dose Over a Threshold of 40 ppb
AST	Agrochemical Soil Testing
BAT	Best Available Techniques
BI OP	Basic Infrastructure Operation Programme
BOD	Biochemical Oxygen Demand
BREF	BAT Reference Document
CCHSP	Centre for Chemical Substances and Products
CCTIA	Central Controlling and Testing Institute in Agriculture
CFM	Co-ordinated Focus-specific Monitoring
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
CM	Cultural Monument
COD	Chemical Oxygen Demand
COD_{Cr}	Chemical Oxygen Demand by Dichromade
COD_{Mn}	Chemical Oxygen Demand by Permanganate
Coll.	Collection of Laws
CPM	Co-ordinated Purpose-oriented Monitoring / Consumption Pool Monitoring
CR	Critically Endangered Taxon
ČSFR	Czechoslovak Federative Republic
dB	Decibel
DD	Data Deficient Taxon
D.U.	Dobson units
EC	European Commission / European Community
Ed	Endemic Taxon
EDW	Emergency Deteriorations of Water
EEA	European Environmental Agency
EEC	European Economic Community
EFP	Environment-friendly Product
EIA	Environmental Impact Assessment
ELC	European Landscape Convention
EMAS	Eco-Management and Audit Scheme
EMEP	European Monitoring and Evaluation Programme
EMS	Environmental Management System
EN	Endangered Taxon
ENP_{UV}	Extracting Non-polar Substances
EOP	Environmental Operation Programme
EP	European Parliament
ERDF	European Regional Development Funds
EU	European Union
EUROSTAT	Statistical Office of the European Communities
EX	Extinct Taxon
FAO	Food and Agriculture Organisation of the United Nations
FDI	Foreign Direct Investments
FoRI SR	Food Research Institute of SR
GCCA SR	Geodesy Cartography and Cadastre Authority of the Slovak Republic
GDP	Gross Domestic Product
Gg	Greenhouse Gases / Giga Grams of CO_2
GMO	Genetically Modified Organisms
GS SR	Geological Survey of the Slovak Republic
GWh	Giga Watt hour
ha	Hectare

HW	Hazardous Waste
IBA	Importance Birds Areas
ICP Forest	The International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests operating under UNECE (United Nations Economic Commission for Europe)
IEA	International Energy Agency
IGCC SR	Institute of Geodesy, Cartography and the Cadastre of the Slovak Republic
IMS	Information Monitoring System
Inc.	Incorporated
INES	International Nuclear Event Scale
IPCC	Intergovernmental Panel of Climate Change
IPPC	Integrated Prevention and Pollution Control
IS	Insoluble Substances
ISO	International Organization for Standardization
IUCN	The International Union for the Conservation of Nature and Natural Resources
JRC	Joint Research Centre
kt	Kilotonnes
KURS 2001	The Conception of Spatial Development of Slovakia 2001
LA	Loaded Area
LR	Lower Risk Taxon
Ltd.	Limited corporation
MB SR	The Monuments Board of the Slovak Republic
MGF	Monitoring of Game, Wildlife, and Fishes
MMO SR	Main Mining Office of the Slovak Republic
MoA SR	Ministry of Agriculture of the Slovak Republic
MoC SR	Ministry of Culture of the Slovak Republic
MoCRD SR	Ministry of Construction and Regional Development of the Slovak Republic
MoD SR	Ministry of Defence of the Slovak Republic
MoE SR	Ministry of Environment of the Slovak Republic
MoEC SR	Ministry of Economy of the Slovak Republic
MoED SR	Ministry of Education of the Slovak Republic
MoF SR	Ministry of Finance of the Slovak Republic
MoFA SR	Ministry of Foreign Affairs of the Slovak Republic
MoH SR	Ministry of Health of the Slovak Republic
MoI SR	Ministry of Interior of the Slovak Republic
MoJ SR	Ministry of Justice of the Slovak Republic
MoLSAF SR	Ministry of Labour, Social Affairs and Family of the Slovak Republic
MoTPT SR	Ministry of Transport, Posts and Telecommunications of the Slovak Republic
MR	Monument Reserve
MW	Municipal Waste, MegaWatt
NATO	North Atlantic Treaty Organisation
NC SR	National Council of the Slovak Republic
NCM	National Cultural Monument
NE	Not Evaluated Taxon
NEHAP III	National Environmental and Health Action Plan for the Slovak Republic III
NEIS	National Emission Inventory System
NEL	Non -polar Extractable Substances
NFC	National Forest Centre / Non-refundable Financial Contribution
NFC - FRI	National Forest Centre – Forest Research Institute
NM	Nature Monument
NM VOC	Non-Methane Volatile Organic Compounds
NMSKO	National Monitoring Air Quality Network
NNM	National Nature Monument
NNR	National Nature Reserve
No.	Number

NP	National Park
NPP	Nuclear Power Plants
NR	Nature Reserve
NRA SR	Nuclear Regulatory Authority of the SR
NUTS	Nomenclature of Units for Territorial Statistics
OECD	Organisation for Economic Co-operation and Development
PA	Protected Area
PAH	Polyaromatic Hydrocarbons
PCB	Polychloride Biphenyl
pcs	Pieces
PES	Primary Energy Sources
PG	Permanent Grassland
pH	Acidity in pH
PJ	Peta Joule (10^{15} J)
PLA	Protected Landscape Area
PLF	Protected Landscape Fragment
PM_{10}	Particulate Matter between 2.5 and 10 micrometers in size
PMA	Permanent Monitoring Areas
PMS	Partial Monitoring System
PMS-S	Partial Monitoring System - Soil
PMS- F	Partial Monitoring System - Forests
POPs	Persistent Organic Pollutants
ppb	Parts per Billion
PPP	Purchase Power Parity
PS	Protected Site
pSCI	Proposed Sites of Community Importance
pSPA	Proposed Special Protected Area
PZ	Protective Zone
RAW	Radioactive waste
REACH	European Community Regulation on Chemicals and their Safe Use (EC 1907/2006) (Registration, Evaluation, Authorization and Restriction of Chemical Substances)
RES	Renewable Energy Sources
RIAP	Research Institute for Animal Production
RIPP	Research Institute of Plant Production
RISO	Regional Waste Information System
SAICM	Strategic Approach to International Chemicals Management
SCI	Sites of Community Importance
SD	Sustainable Development
SEA	Slovak Environmental Agency, Strategic Impact Assessment
SEI	Slovak Environmental Inspection
SFA	Slovak Fishing Association
SGI DS	State Geological Institute of Dionýz Štúr
SHMI	Slovak Hydrometeorological Institute
SKK	Slovak Crowns
SMM	Slovak Mining Museum
SMNPaS	The Slovak Museum of Nature Protection and Speleology
SNC SR	State Nature Conservancy of the Slovak Republic
SO SR	Statistical Office of the Slovak Republic
SPA	Special Protected Area
SR	Slovak Republic
SR GO	SR Governance Ordinance
SSCRI	Soil Science and Conservation Research Institute
SSPA	Small-size Protected Areas
STN	Slovak Technical Standard
SVA SR	State Veterinary Administration of SR

SWME	State Water Management Enterprise Inc. Žilina
TANAP	Tatras National Park
Tg	Tera grams of CO2
TJ	Tera Joule
TWh	Tera Watt Hour
UN	United Nations
UNECE UN EEC	UN Economic Commission for Europe
UNEP	United Nations Environment Programme
UNESCO-MaB	The United Nations Educational, Scientific and Cultural Organization – Man and the Biosphere
ÚPD	Physical-planning Documentation
V4	Visegrad group (4 Central European Countries: Czech Rep., Slovakia, Hungary, Poland)
VaK	State Enterprises Water and Sewage Works
VOC	Volatile Organic Compounds
VRP	Village Renewal Program
VU	Vulnerable Taxon
WFD	Water Framework Directive
WH	World Heritage
WHO	World Health Organization
WQEDA	Water Quality Endangerment and Deterioration Accidents
WRI	Water Research Institute
WWTP	Waste Water Treatment Plants

STATE REGISTRATION NUMBER OF THE DISTRICTS IN THE SR

Bratislava region	
Bratislava I.-V	BA,BL
Malacky	MA
Pezinok	PK
Senec	SC
Trnava region	
Trnava	TT,TA
Dunajská Streda	DS
Galanta	GA
Hlohovec	HC
Piešťany	PN
Senica	SE
Skalica	SI
Trenčín region	
Trenčín	TN,TC
Bánovce nad Bebravou	BN
Ilava	IL
Myjava	MY
Nové Mesto nad Váhom	NM
Partizánske	PE
Považská Bystrica	PB
Prievidza	PD
Púchov	PU
Nitra region	
Nitra	NR,NI
Komárno	KO
Levice	LV
Nové Zámky	NZ
Šaľa	SA
Topoľčany	TO
Zlaté Moravce	ZM
Žilina region	
Žilina	ZA,ZI
Bytča	BY
Čadča	CA
Dolný Kubín	DK
Kysucké Nové Mesto	KM
Liptovský Mikuláš	LM
Martin	MT
Námestovo	NO
Ružomberok	RK
Turčianske Teplice	TR
Tvrdošín	TS
Banská Bystrica region	
Banská Bystrica	BB,BC
Banská Štiavnica	BS
Brezno	BR
Lučenec	LC
Detva	DT
Krupina	KA
Poltár	PT
Rimavská Sobota	RS
Veľký Krtíš	VK
Zvolen	ZV
Žarnovica	ZC
Žiar nad Hronom	ZH
Prešov region	
Prešov	PO,PV
Bardejov	BJ
Humenné	HE
Kežmarok	KK
Levoča	LE
Medzilaborce	ML
Poprad	PP
Sabinov	SB
Snina	SV
Stará Ľubovňa	SL
Stropkov	SP
Svidník	SK
Vranov nad Topľou	VT
Košice region	
Košice I.až IV	KE,KI
Košice okolie	KS
Gelnica	GL
Michalovce	MI
Rožňava	RV
Sobrance	SO
Spiš ká Nová Ves	SN
Trebišov	TV

SVETOVÉ KULTÚRNE A PRÍRODNÉ DEDIČSTVO SLOVENSKA


Vlkolínec


Kostol Sv. Ducha v Žehre


Spišský hrad


Spišské Podhradie


Spišská Kapitula


Drevený kostol v Hronseku


Bardejov


Banská Štiavnica


Karpatské bukové pralesy


Dobšinská ľadová jaskyňa


Jasovská Domica


Ochtinská aragonitová jaskyňa


Gombasecká jaskyňa


Jasovská jaskyňa

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