MINISTRY OF ENVIRONMENT
OF THE SLOVAK REPUBLIC

STATE OF THE ENVIRONMENT REPORT SLOVAK REPUBLIC 2010

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Slovak Environmental Agency

FOREWORD

Each person living in Slovakia is guaranteed his or her constitutional right to a suitable environment that, besides other factors, has a direct influence on that person's quality of life. Slovak Government considers **environmental protection and formation** one of its significant activities, as witnessed by the government program resolution. Re-creation of the Ministry of Environment on November 1, 2010 testified to a responsible approach of the Slovak Government and its understanding of the importance of environmental care.

Many times, amid the duties and obligations of our everyday life, we tend to take certain facts for granted and fail to appreciate the significance of having also a high-quality environment and its existence necessary for us as well as the whole of humanity. Many times we also fail to perceive **nature's beauty** and the still-present **richness of biodiversity** which have long been the typical characteristics of Slovakia. Only few countries can pride themselves with such diversity and variability of landscape. Because the Slovak Republic has stayed true to these values, it now forms part of the growing European network of NATURA 2000 protected areas. The need for their protection is ever more important in light of the fact that up to date the European Union has not been able to achieve its benchmark goal set for the year 2010 - halting the loss of biodiversity.

Sources of drinking water constitute one of the largest natural resources. The fact that it costs something (not the economic cost) remains unnoticed most of the time when turning the faucet. We realize very well that not everywhere in the world exist places that have water in abundance and of excellent quality. We must do everything to protect these sources also for the future. This relates to taking steps to **connect municipalities to public water supplies and sewerage systems**. We are well aware of the fact that in the area of **building waste water treatment plants** we are still lagging behind, as declared by the Organization for Economic Cooperation and Development (OECD) at its environmental performance review of Slovakia.

In terms of assessing the progress achieved in the protection of the environment we can say that we have achieved a **considerable improvement** in a number of sectors and regions. As an example let me use the **long-term reduction in the emissions** of air pollutants, reducing the **volumes of waste water** and contamination discharged into watercourses, as well as reduction in surface and ground water abstractions. In total, the updated environmental regional classification of 2010 shows that we are achieving the objective to **decrease the size of territories with damaged and heavily damaged environment.**

Despite the accelerated industrial growth in Slovakia, the **greenhouse gases emissions** in the years 2000-2008 stabilized themselves. This is a very significant fact and we believe it is necessary to maintain this trend and to adopt measures leading to a further drop in these emissions Nevertheless, the objective to limit climate change so much that the global temperature rise in this century will not exceed 2°C will most likely remain unmet. Almost all **impacts of climate change** such as weather

changes, climatic changes, changes to water regime, ecosystems, air quality, etc., may ultimately influence human health as well as other values. Last but not least, these are interlinked with considerable financial burdens of eliminating threats and negative phenomena. Also, the year 2010 was a typical example of these visible impacts. Slovakia was afflicted with **floods** that caused damage amounting to almost 500 mil. EUR. These floods were devastating to many people. Therefore, fighting the floods has been one of the priorities within the implementation of our new environmental strategy. This resulted in passing a new legislation - Act No. 7/2010 Coll. on flood protection, as well as in adopting documents related to landscape revitalisation and integrated management of watersheds. Exceptionally extreme rainfalls not only directly resulted in floods, but also in a system of newly-formed **landslides** that besides causing a serious damage to buildings and infrastructure also destroyed the existing state of the environment.

The **existing environmental loads** are also a major negative environmental element. A big initiative to tackle these problems is seen in the adoption of the National Programme of Sanation of environmental loads in March of 2010 and in the preparation of a law concerning the identification of environmental loads, as well as in adopting certain measures connected to their elimination and funding. This is a result of 8 years of initiative of the Ministry (Act No. 409/2011 Coll. on selected measures in the area of environmental load as amended).

Slovakia is a rather small country in the heart of Europe. For us, this fact leads to the necessity of seeking cooperation at the European or global levels, since **"the environment knows no borders"**. It is our actions that directly influence our environment not only in our country, but also in the neighbouring states. And this principle works both ways. This can be illustrated by the **ground ozone** load on Slovakia where despite a significant reduction in the ozone precursors emissions over the recent years there has not been a reduction in ground ozone concentration and the valid limit values are continually exceeded.

In the years 2010-2011, Slovak Republic succeeded in the second **environmental performance review** by the OECD. The review showed a success that had been achieved at the implementation of the objectives at the national and international levels; however, at the same time it also articulated the areas and measures that require more attention and increased efforts. Just like shown at numerous international platforms, the economic recession and the lack of funding are not legitimate reasons for lessening our effort to improve the quality of the environment. The solution lies in the change to a **greener economy**. However, such solution calls for a change in a number of attitudes and approaches, but, most of all, for a common integrated approach of all affected ministries, local governments, businesses, academic institutions, non-government organisations and groups of citizens in order to continue reducing the pressures and impacts on the environment.

It is the duty of us all to **protect the environment** either through our attitude toward exploiting natural resources or, for example, our attitude to waste generation and handling and by taking an active part in the approach to the issues related to environmental protection. We cannot and must not remain indifferent to the question of what will remain of our planet when future generations come.

In order to be able to give a competent answer to the question of the course of our environment, we have to have access to high-quality and timely information. This State of the Environment Report of the Slovak Republic in 2010 serves the above-mentioned purpose. Specifically, its objective has been to show key findings and answer key questions about the state and development of the environmental situation in our country - the factors that impact this development. At the same time, the Report undertakes to assess the efficacy of selected environmental protection tools.

Ing. József Nagy

Minister of Environment of the Slovak Republic

COMPONENTS OF THE ENVIRONMENT AND THEIR PROTECTION

• AIR

Key questions and key findings

♦ Key questions

- What is the recent trend in the area of production of polluting substances in the Slovak Republic?
- Is Slovakia fulfilling its obligations given by international conventions in the area of air protection?
- Are the air pollutants limit values for human health protection complied with?
- Are the air pollutants limit values for vegetation protection complied with?
- What has been the trend in the condition of the ozone layer and intensity of solar radiation over the SR territory?
- Is the SR fulfilling its international obligations in the area of the Earth's ozone layer protection?

♦ Key findings

- Emissions of basic pollutants (PM, SO_2, NO_X, CO) over a long-term horizon (1990-2009) have been consistently reduced; however, the speed of reduction after 2000 has been significantly slower. There was a temporary increase in emissions detected in 2003-2005; however, after 2005 the trend was falling again.
- Ammonia emissions have been persistently decreasing over a long time period.
- NMVOC emissions over a longer time horizon (1990-2000) have been decreasing persistently. In the period of 2000 to 2009 the values were maintained more-less at the same level, with slight fluctuations in specific years.
- Persistent organic pollutants (POPs) emissions dropped significantly over the period of 1990-2000. When the years 2001 and 2009 were compared, there was seen a reduction in the PCDD/PCDF emissions by 50.3%, PCB emissions by 4.4%, and the sum of PAH emissions increased by 29%.
- Slovakia is fulfilling its obligations given by international legislation in the area of air protection.
- The designated 19 areas of air quality management in 2010 covered the size of 2 904 km^2 with 1 404 721 people, which represent 26% of total Slovak population.
- Notwithstanding the persistent decrease in the pollutants emission, in 2010 a number of monitoring stations again detected exceeded limit values for selected air-borne pollutants (NO_X, PM_{10}, $PM_{2.5}$) designated to ensure human health protection.
- The massive reduction in national emissions of ozone precursors over the last years has not resulted in reduced ground ozone concentrations in Slovakia. Some ground ozone characteristics in 2010 remained at a relatively high level achieved in the previous years.
- Limit values of air-born pollutants (SO_2, NO_X) designated for the protection of vegetation have not been exceeded. Exceeded values were detected for ground ozone.
- Total atmospheric ozone was above the long-term average values, within a 2.4% deviation above the mean value; total sum of daily doses of the ultraviolet erythema radiation decreased.
- Slovakia is fulfilling its obligations given by international legislation in the area of ozone layer protection.

Emission situation

♦ Balance of basic pollutants emissions

Trend in emissions of particulate matter

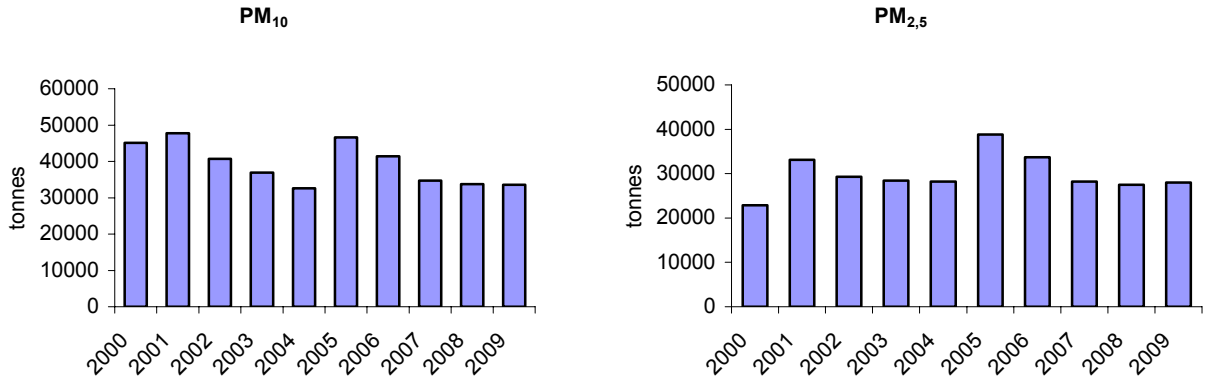
Emissions of particulate matter have shown a steady reduction since 1990, which, apart from reduction in production and energy consumption, has been caused by a change within the fuel group toward more purified fuels, as well as by using fuels with higher quality labels.

Reduction in particulate matter emissions was further contributed to by introduction of separation equipment or increasing its efficiency, respectively. Increase in the PM emissions over 2004-2005 was caused by an increased consumption of wood within the sector of small-size sources (heating up of houses) due to increased natural gas and coal prices for small consumers. Reduction in the PM emissions in 2006 was caused mainly by reconstructions of the separation equipment in several power management and industrial installations. Further decrease in the PM emissions by large stationary sources in 2007 was caused by the fact that some incineration units installed at significant sources were out of operation. Since 2008, the PM emissions trend has continued to decrease slightly.

Balance of PM_{10}, $PM_{2.5}$ emissions

In the sector of road transport, diesel engines are among the major contributors to the PM_{10} and $PM_{2.5}$ emissions. The share of abrasion is less significant than in the case of the PM emissions. In total, the most significant contributors to the PM_{10} and $PM_{2.5}$ emissions include small sources (heating of houses). Increased emissions in this sector reflect the increased consumption of wood caused by growing prices of natural gas and coal.

Development trends in PM_{10} a $PM_{2.5}$ emissions



Emissions were stated to the date 15.2.2011

Source: SHMI

Trend in emissions of sulphur dioxide

Emissions of 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.

Decreasing trend in the SO_2 emissions until 2000 was caused by reduction in the consumption of brown coal and lignite, heavy heating oil, using of low-sulphur heating oils, and installation of desulphurisation plants at all large power sources. Fluctuating trend in the CO_2 emissions in 2001 through 2003 was caused by partial or full operation, by the quality of burnt fuel types, and by the volume of production at energy sources. In 2004-2006, there was another reduction in the SO_2 emissions, especially in large stationary sources. This reduction was caused mainly by burning low-sulphur heating oils and coal, and by a reduced production volume. In 2005, there was a significant reduction in the SO_2 emissions from road transport, by as much as 77%. This reduction, despite the increased fuel consumption, was caused by implemented measures relating to the sulphur content in fuels (Resolution of the Slovak Ministry of Environment no. 53/2004 Coll.) Further decrease in the SO_2 emissions by large stationary sources in 2007 was caused by the fact that some incineration units installed at significant sources were out of operation. Since 2008, the SO_2 emissions trend has continued to decrease.

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Trend in emissions of nitrogen oxides

Emission of nitrogen oxides since 1990 dropped slightly despite the fact that they grew slightly in 1994-1995 due to an increased natural gas consumption.

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,

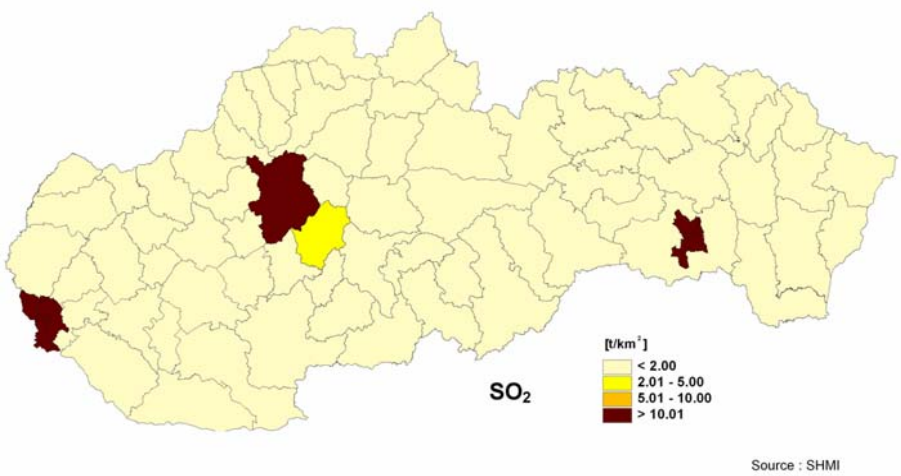
there was a significant reduction in the NO_X emissions, especially in case of large and medium stationary sources. This reduction relates to reduced production (Zemianske Kostoľany and Vojany electrical power plants) and consumption of solid fuels and natural gas (Zemianske Kostoľany and Vojany electrical 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 also relates to the modernisation of personal and freight vehicles, as well as the use of a more exact emission factor.

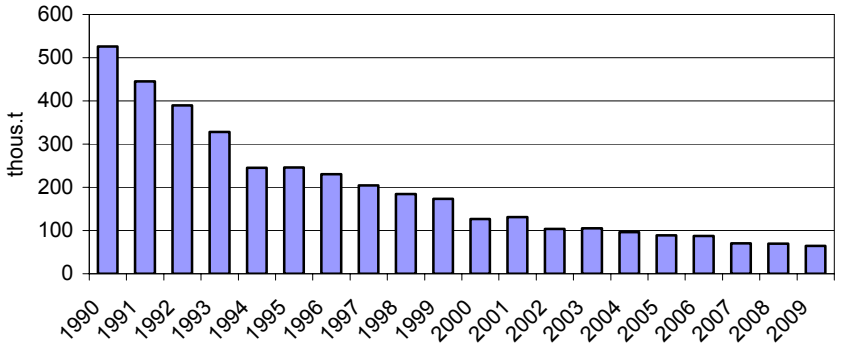
Trend in carbon monoxide emissions

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.

Element regional emission of SO_2 in 2009 ($t.km^{-2}$)

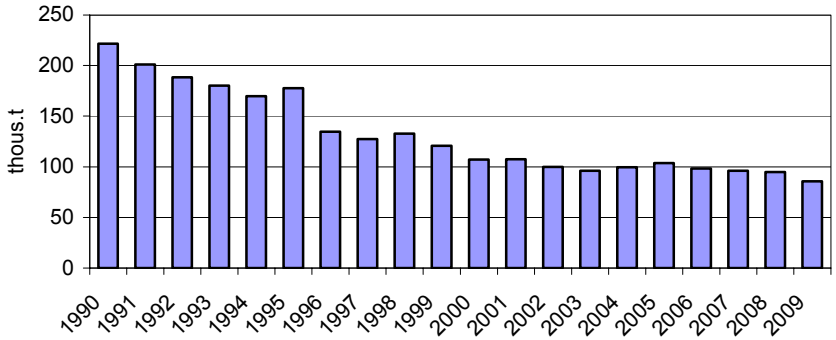


Trend in emission of SO_2



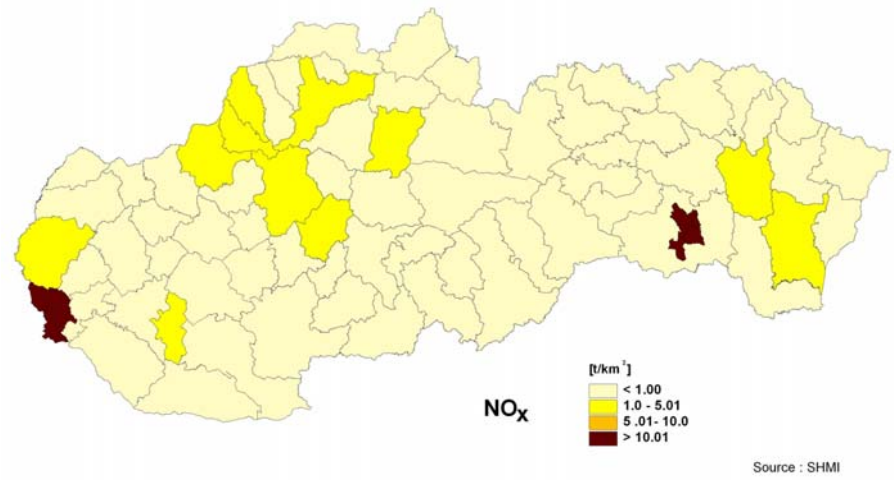
Source: SHMI

Trend in emission of NO_X

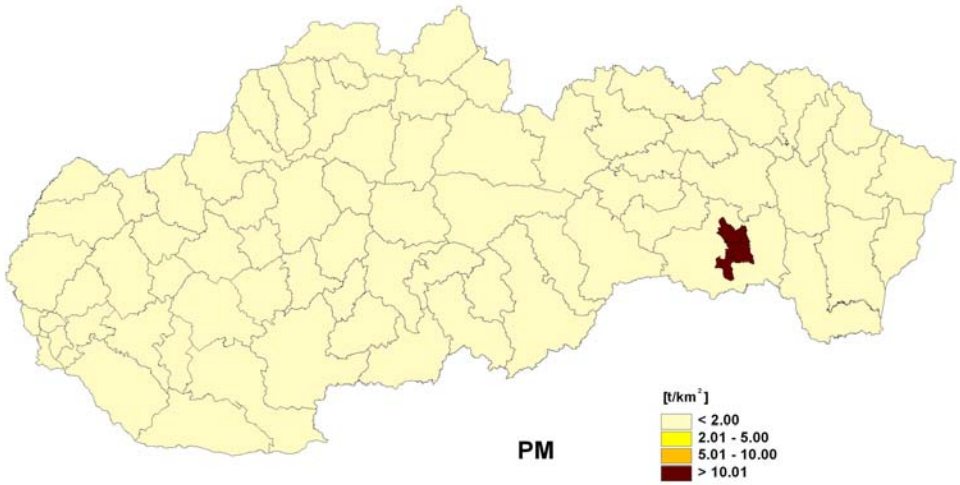


Source: SHMI

Element regional emission of NO_X in 2009 ($t.km^{-2}$)

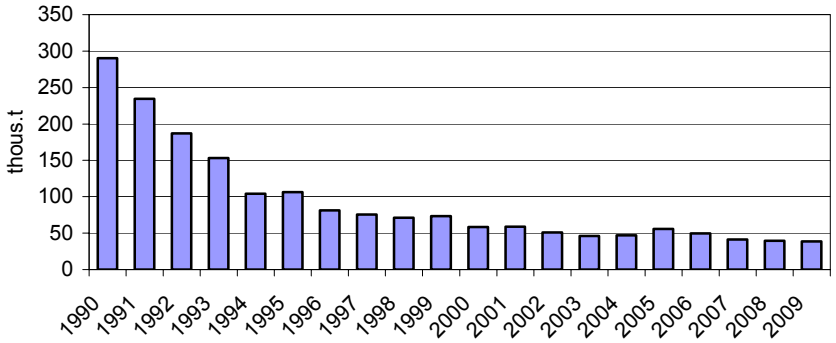


Element regional emission of PM in 2009 (t.km^{-2})



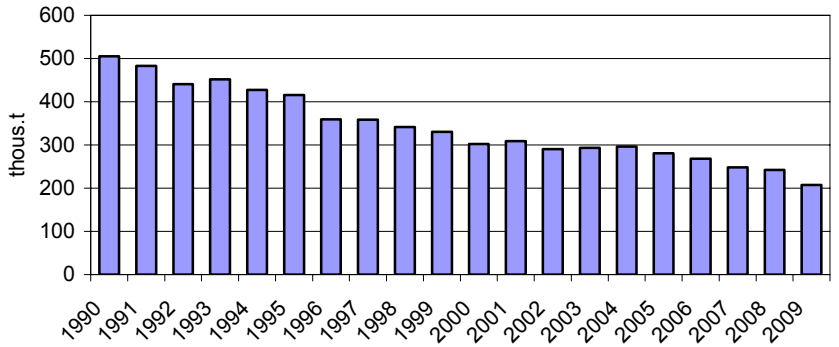
Source : SHMI

Trend in emission of PM



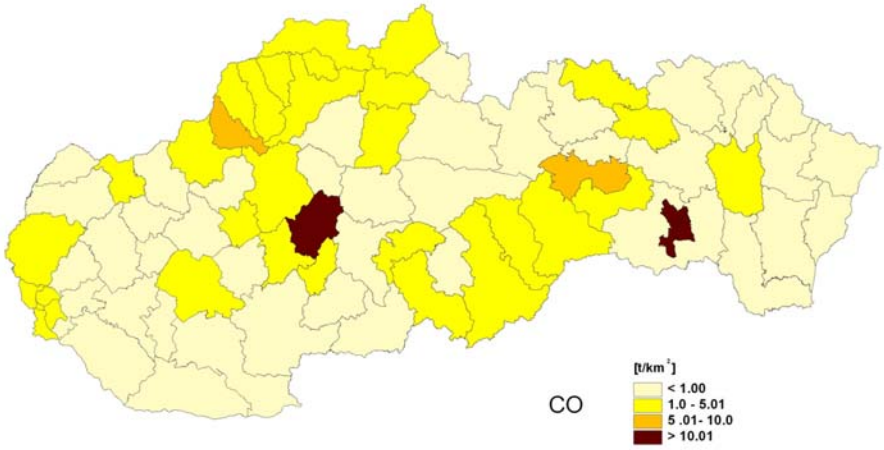
ource: SHMI

Trend in emission of CO



Source: SHMI

Element regional emission of CO in 2009 (t.km^{-2})



Source : SHMI

Meeting international obligations for the basic pollutants emissions

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 protocols' obligations in the area of acidification are met:

- ***Protocol on further reduction of sulphur 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 sulphur emissions

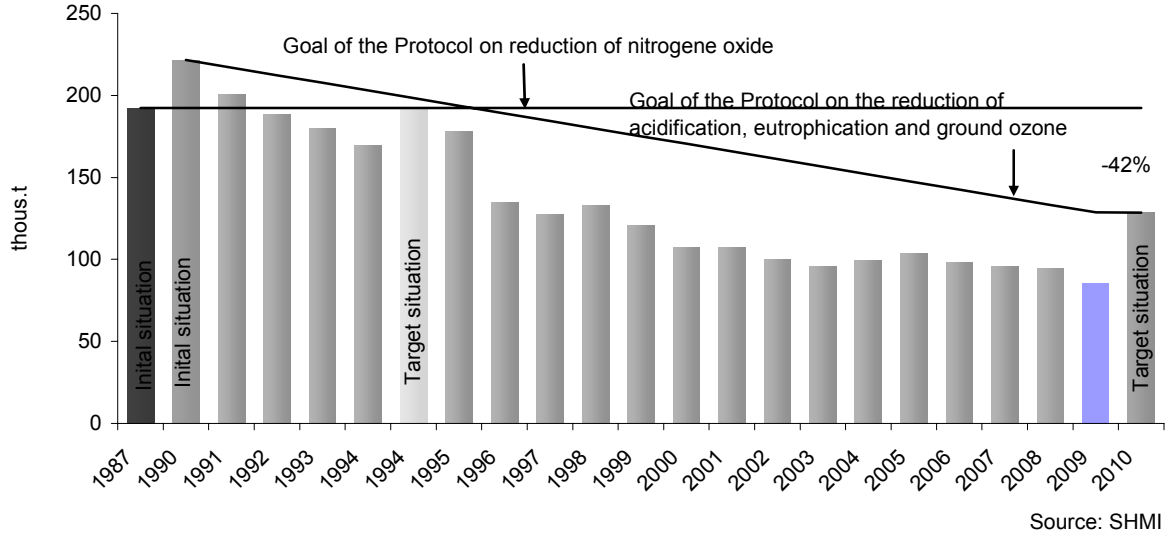
Year	1980 (initial year)	2000	2005	2010
SO_2 emission (thous. t)	843	337	295	236
SO_2 emission reduction (%)	100	60	65	72

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, sulphur dioxide emissions reached the level of 123.880 thousand tons, which is 85% less than in the years 1980. In 2005 it was 89 thousand t, which is 89% less than in 1980. In 2009, sulphur dioxide emissions reached the level of 64.082 thousand tons, which is 89% less than in 1980.

- ***Protocol on the Reduction of Acidification, Eutrophication and Ground Ozone***

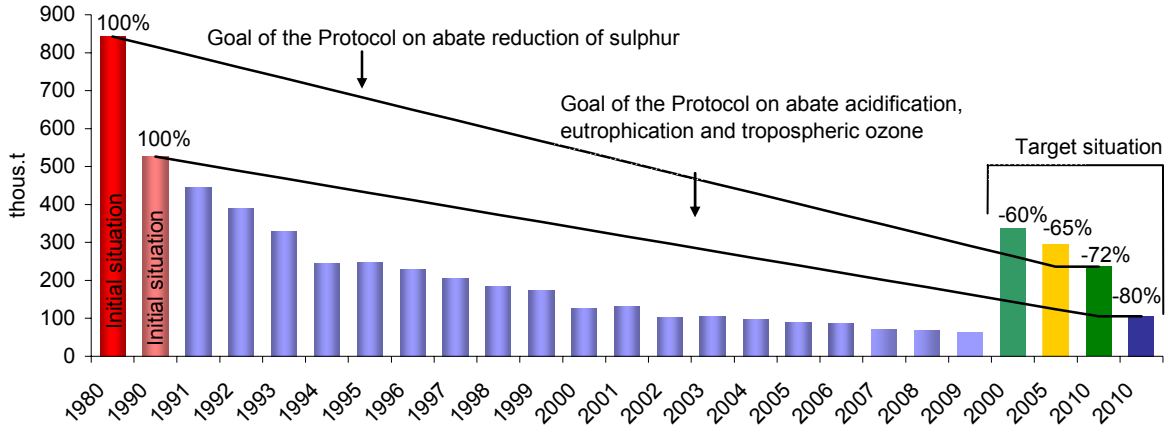
The protocol was signed in Göteborg in 1999. Slovakia signed the protocol in 1999 and ratified in 2005. Slovakia obliged itself to reduce the SO_2 emissions by 2010 by 80%, the NO_2 emissions by 2010 by 42%, the NH_3 emissions by 2010 by 37% and the VOC emissions by 2010 by 6% in comparison to the year 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 regard to following the outcomes of international agreements



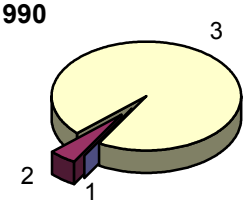
Source: SHMI

♦ Balance of ammonia emissions (NH_3)

Production of the NH_3 emissions$_3$ in 2009 was 25 016.39 tonnes. More than 90% of all NH_3 emissions originate in the sector of agriculture - livestock production and animal waste management. NH_3 emissions from the use of artificial nitrogen fertilisers also represent a significant category in the sector of agriculture. NH_3 emissions from the energy sector/industrial production and transport are less significant. NH_3 emissions from industrial production originate mainly from nitric acid production. NH_3 emissions from transport originate mainly from road transport.

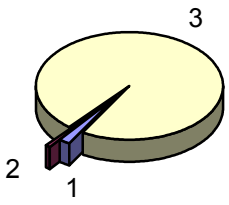
The contribution of the particular sectors in NH_3 emission

1990



0.05%	1. Transport	1.85%
4.79%	2. Industry	0.85%
95.17%	3. Agriculture	97.30%

2009

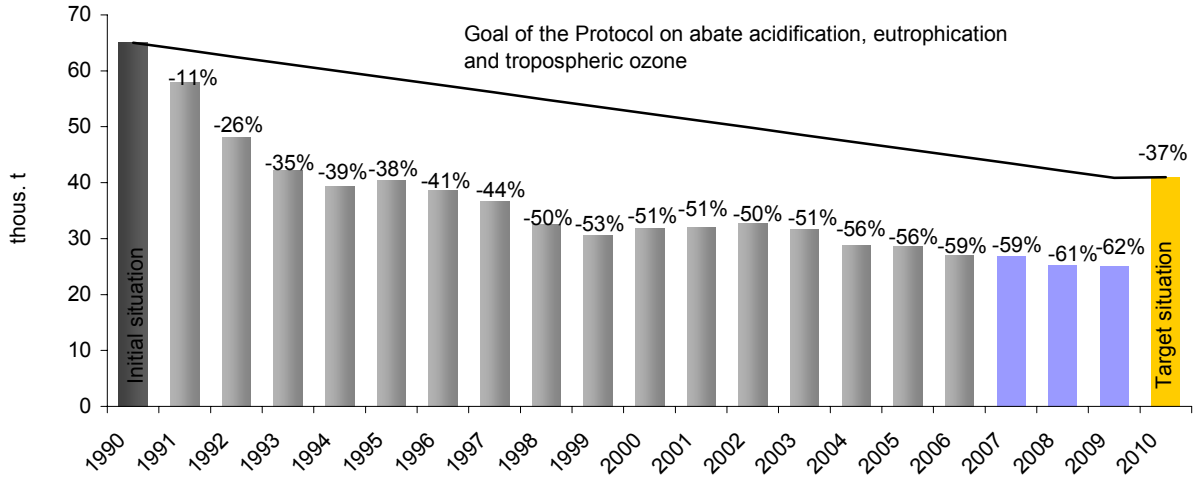


Emissions were stated to the date 15.2.2011

Source: SHMI

Over a long-term period, there is a persistent decrease in total volumes of NH_3 emissions. This reduction in 2009 represents a 62% decrease compared to 1990.

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



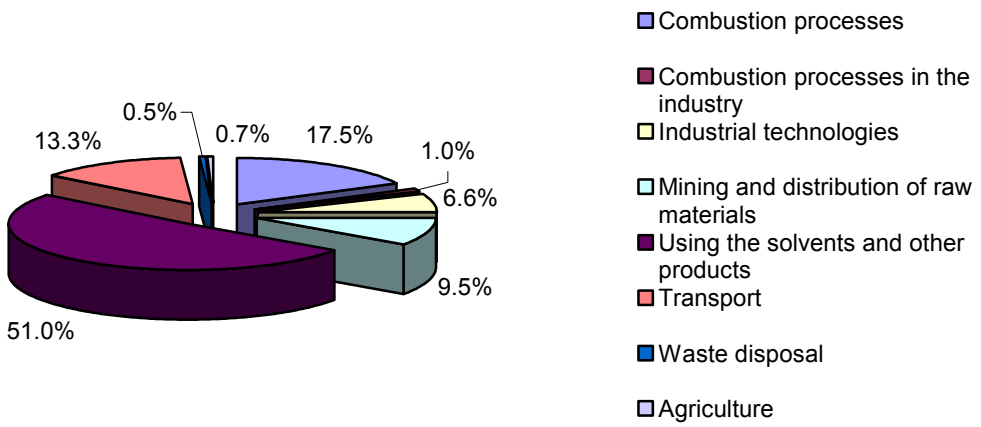
Source: SHMI

♦ Emissions of non-methane volatile organic compounds

Drop in total NMVOC emissions was caused by a number of measures, such as reduction in using coating compounds and by gradual introduction of low-solvent types of coatings, extensive introduction of measures in the sector of crude oil processing and fuel distribution, introduction of gas technologies into incineration, especially in the energy area, and by the change to the portfolio of cars toward vehicles equipped with the operated catalyser. Since 2000, the NMVOC emissions in the area of paints and glues have increased by 54%, since the use of these products is part of a wide spectrum of industrial activities and various technological operations. The consumption and import of printer colours and solvent-based paint systems has been continually increasing. In 2004 and 2005 there was a growth in the production of cars, many paint shops were opened, thus increasing also the consumption of paint substances. In 2007, complete time line data for the industrial area of cleansing and degreasing were recalculated due to the need of better precision in calculating the consumption of solvents in the area of paints and glues.

Recalculation of the NMVOC emissions in 2010 was carried out for the sector of waste management for the years 2002, 2004, 2005, and 2008, due to an update in the input data. A new version of the COPERT IV model was used for the road transport emission analysis; therefore, emissions were recalculated until 2000. Total NMVOC emissions dropped from 68.9 kt in 2008 to 65.4 kt in 2009. Reduction in the emissions was caused mainly due to a decreased industrial production.

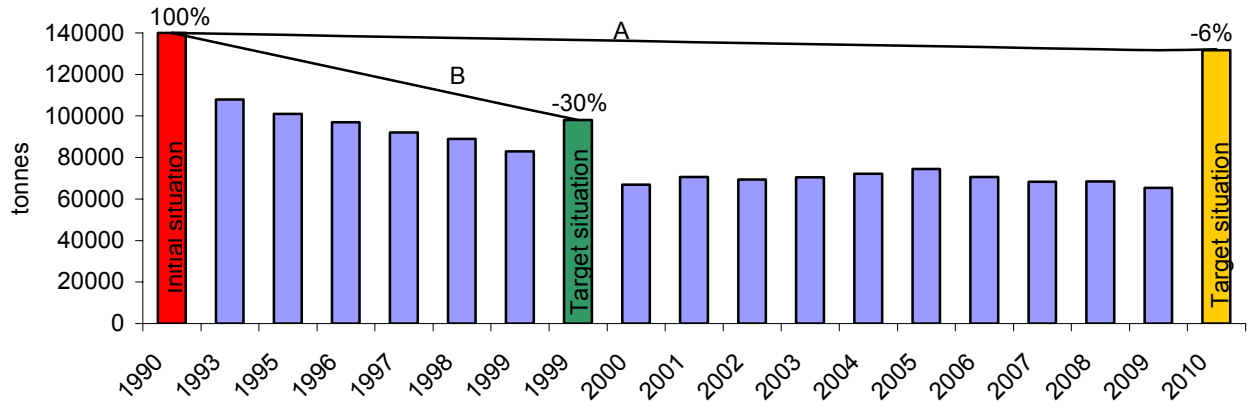
The contribution of the NMVOC emission according to sector of their origin in 2009



Emissions were stated to the date 15.2.2011

Source: SHMI

Trend in NMVOC emissions with regard to fulfilling of the international agreements



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

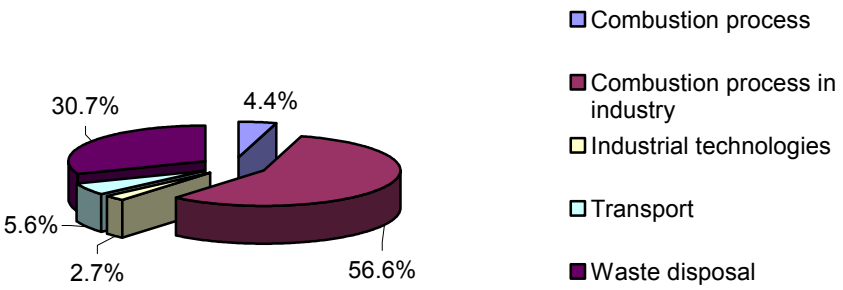
♦ Balance of heavy metals emissions

Heavy metal emissions have decreased significantly since 1990. Besides shutting off a number of old-fashioned and non-effective productions, this trend has been influenced by extensive reconstructions of separation equipment, change in raw material used, and, most of all, by transition to using unleaded petrol types since 1996. Since 2004, the register of heavy metals from household fuel burning has included the burning of wood. Trends in the heavy metal emissions over the recent years are characteristic for slight fluctuations. In 2007, lead and mercury emissions dropped, compared to the 2006 figures, due to a reduction in the ore agglomeration and glass production. At the same time, cadmium emissions increased in the same year, which related to an increased copper production. In 2008, lead, cadmium, copper, zinc, and selenium emissions increased due to an increased volume of incinerated industrial waste and increased emissions in the area of industrial, municipal power management , and system power industry.

In 2009, there was a reduction in heavy metal emissions which related to a reduction in the industrial production. In 2010, there was a recalculation carried out in the sector of waste handling for the years 2002, 2004, 2005, and 2008, due to an update in the input data. A new version of the

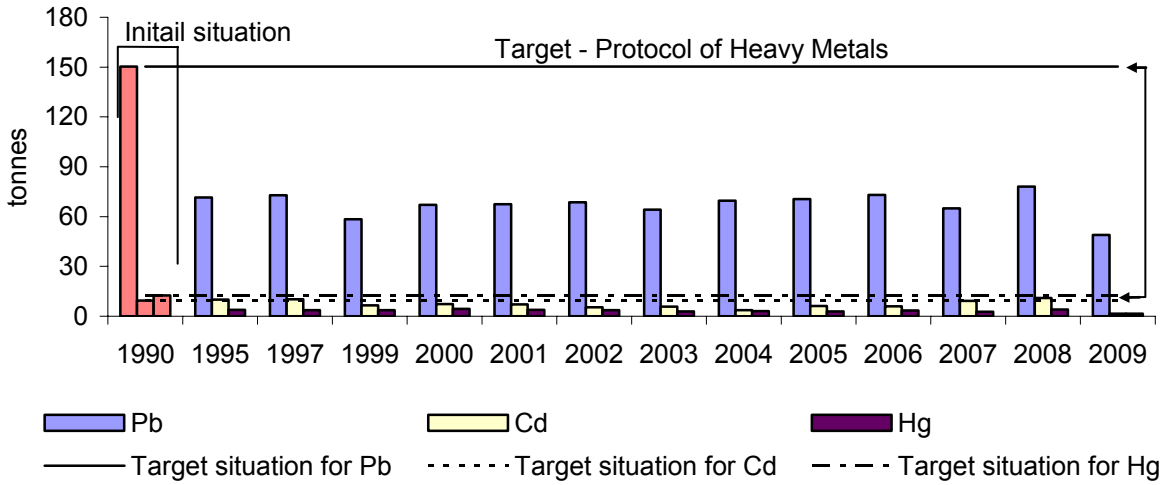
COPERT IV model was used for the road transport emission analysis; therefore, emissions were recalculated until 2000. Next, cadmium emissions from glass production were calculated for the years 2007 and 2008, due to a revised emission factor for colour glass.

The contribution of the particular sectors in the Pb emission production for year 2009



Emissions were stated to the date 15.2.2011 Source: SHMI

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



Source: SHMI

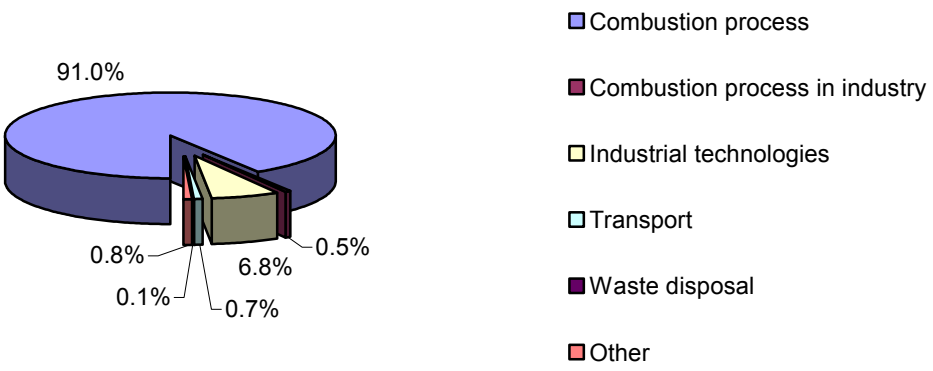
♦ Balance of Persistent organic pollutants (POPs)

The POPs emissions in 2010 were recalculated for the complete time line while considering technological improvement at waste incineration.

Decreasing trend in the POPs emissions was most clearly seen in the 90ties for PAH where the reduction in emissions was mainly caused by a change to the aluminium production technology. (using previously burnt anodes) Growth in the PCB emissions (polycyclic biphenyls) over the last years has been influenced primarily by an increased consumption of diesel in road transport and an increased consumption of wood by small sources (heating of households). Increased wood consumption in this sector influenced also the growth in total PAH emissions. PCDD/F emissions have dropped since 2000 due to the reconstruction of a number of installations (municipal waste incineration units). PCDD/F emissions are influenced by the volume of incinerated medical waste, volume of agglomerated iron ore, and by fuel composition in the sector of household heating. A slight increase in

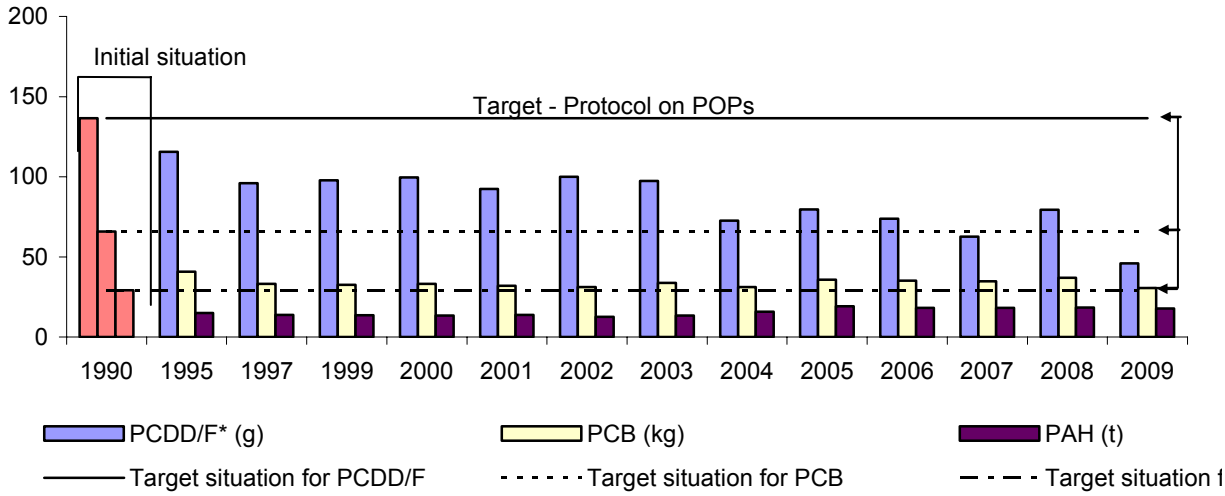
the emissions of polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAH) caused increased volume of modal split in road transport and an increased fuel consumption. Fluctuating emissions of hexachlorbenzene (HCB) reflects the fluctuating production of secondary copper together with a growth in the volume of modal split in road transport. A slight reduction in the emissions of polychlorinated dioxins and furans (PCDD/PCDF) and polychlorinated biphenyls (PCB) in 2009 was caused by reduced waste incineration; total emissions of polycyclic aromatic hydrocarbons (PAH) show a slight reduction compared to 2008, due to a lower coke production.

The contribution of the particular sectors in the PAH emission production for year 2009



Emissions were stated to the date 15.2.2011 Source: SHMI

Trend of POPs emissions regarding the fulfilment of the international conventions



Source: SHMI

Air pollution

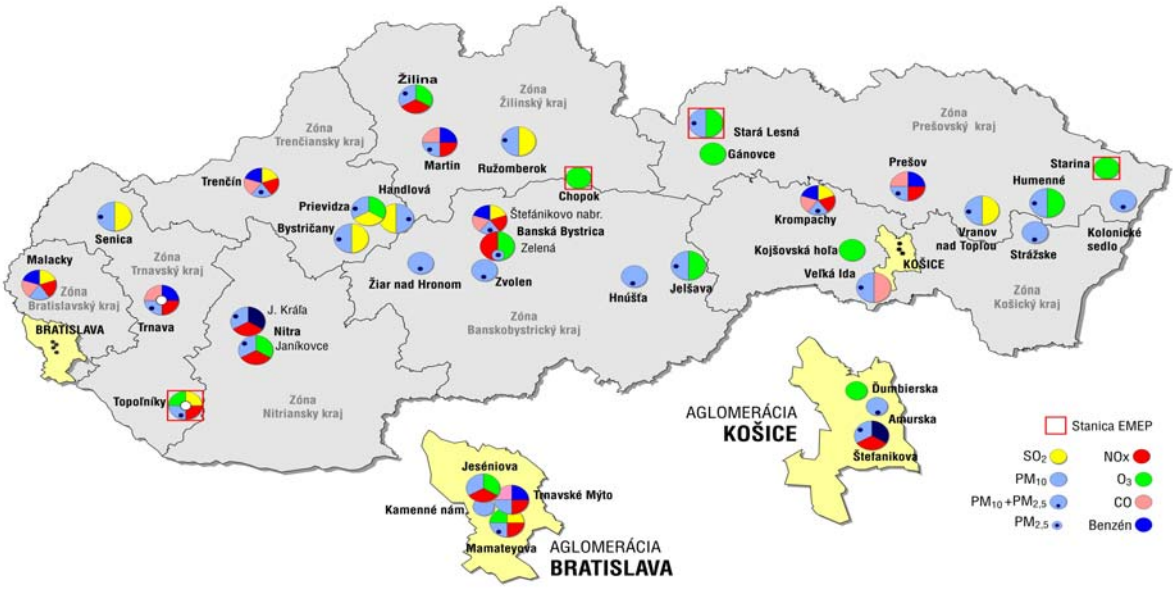
♦ Air quality and its limits

In compliance with the requirements of Act **137/2010 Coll.** on air protection, the whole Slovak territory was divided into 8 **zones** and 2 **agglomerations** that are further subdivided into 19 **air quality management areas.**

Air quality management area is an agglomeration or a designated part of the zone with exceeded:

- limit values for one substance or more pollutants increased by tolerance threshold,
- limit value of one substance or more pollutants, if no tolerance threshold is set,
- target value for ozone, $PM_{2.5}$, arsenic, cadmium, nickel, or benzo(a)pyrene.

National monitoring air quality network - 2010



Source: SHMI

♦ Local Air pollution

Sulphur dioxide

In 2010, no agglomeration showed exceeded levels of pollution in hourly or daily values for public health protection limit beyond what is allowed by Directive 360/2010 Coll. on air quality.

Nitrogen dioxide

In 2010, annual limit value was exceeded at the monitoring stations of Banská Bystrica-Štefánikovo nábrežie, and Bratislava-Trnavské mýto. The highest average annual concentration of 62.5 $\mu g.m^{-3}$ shown at the Banská Bystrica station significantly exceeded the limit value of 40 $\mu g.m^{-3}$ due to ongoing construction and terrain works on building a road bypass in Banská Bystrica. Exceeded limit value for the protection of human health for hourly concentrations was not detected by any monitoring station beyond what is allowed by Directive 360/210 Coll. on air quality.

PM_{10}

In 2010, daily limit value was exceeded at 21 stations. In the same year, Slovakia was exempted by the EC, pursuant to article 22 of Directive 2008/50/EC from applying daily limit values for PM_{10} defined in Annex XI. This exception can be practically applied for the zones of the Trenčín, Trnava, and Prešov regions on June 11, 2011. None of the 6 stations that exceeded the daily value at the mentioned stations showed exceeded daily values with added tolerance threshold. Assessment of

PM_{10} by the limit value increased with tolerance threshold ended at these stations on June 11, 2011. By then, Slovakia must comply with the limit value for pollution for the whole Slovak Republic. 4 AMS also showed the annual limit value exceeded at the same time.

$PM_{2.5}$

There is only the annual limit of 25 $\mu g.m^{-3}$ set for the $PM_{2.5}$, which will become effective on January 1, 2015; however, this value is considered the target value designated in 2010 and should not be exceeded. In 2010, this value was exceeded at 4 stations.

Carbon monoxide

None of the monitoring stations showed exceeded limit values, and the air pollution figures for the previous time period of 2006-2010 remains below the lower assessment threshold.

Benzene

The highest value for benzene in 2010 was detected at 2.9 $\mu g.m^{-3}$, which is significantly lower than the limit value of 5 $\mu g.m^{-3}$.

Pb

None of the monitoring stations showed exceeded limit values. The sector of metallurgic industry shows the highest level of air pollution detected at the Krompachy-SNP station, however, all average annual concentrations are substantially smaller than the lower assessment threshold.

As, Ni, Cd

There was no occurrence of exceeded target values for any pollutant in 2010. Cd and Ni concentrations for the last 5 years remained below the lower assessment threshold.

BaP

Target value needed be reached by 31.12.2010 was exceeded at the monitoring stations of Bratislava-Trnavské mýto, Veľká Ida-Letná, Krompachy-SNP, and Prievidza-Malonecpalská.

♦ Regional air pollution and atmospheric precipitations

In 2010, Slovakia operated 4 stations for monitoring regional air pollution and chemical composition of precipitation water. All the stations are part of the EMEP network.

Sulphur dioxide, sulphates

In 2010 regional sulphur dioxide concentrations calculated per sulphur were 0.22 $\mu g.m^{-3}$ at Chopok, and 0.72 $\mu g.m^{-3}$ at Starina. Pursuant to Annex 13 to Regulation no. 360/2010 Coll., critical level for the protection of vegetation is 20 $\mu g\ SO_2.m^{-3}$ for the calendar year and the winter season. This level was exceeded neither for the calendar year (Chopok 0.44 $\mu g\ SO_2.m^{-3}$ and Starina 1.44 $\mu g\ SO_2.m^{-3}$) nor for the winter season (Chopok 0.6 $\mu g\ SO_2.m^{-3}$ and Starina 2.0 $\mu g\ SO_2.m^{-3}$). Percentage share of

sulphates on total particulate matter mass was 15.54% at Chopok and 16.2% at Starina. Sulphates to sulphur dioxide concentration ratios expressed in sulphur was 1.18 at Chopok and 1.16 at Starina.

Nitrogen oxides, nitrates

Concentration of nitrogen oxides at regional stations expressed in NO_2-N were in 2010 0.76 µg.m^{-3} at Chopok and 1.13 µg.m^{-3} at Starina. Pursuant to Annex 13 to Regulation no. 360/2010 Coll., critical level for the protection of vegetation is 30 µg NO_X.m^{-3} for the calendar year. This level was not exceeded over the last calendar year (Chopok 2.51 µg NO_X.m^{-3} and Starina 3.72 µg NO_X.m^{-3}). Atmospheric **nitrates** at Chopok and at Starina were mostly in the aerosol form. Gaseous nitrates in 2010 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 9.2% at Chopok and 8.8% at Starina. Ratio of total nitrates (HNO_3 + NO_3) to NO_X-NO_2, as expressed in nitrogen, was 0.14 at Chopok and 0.29 at Starina.

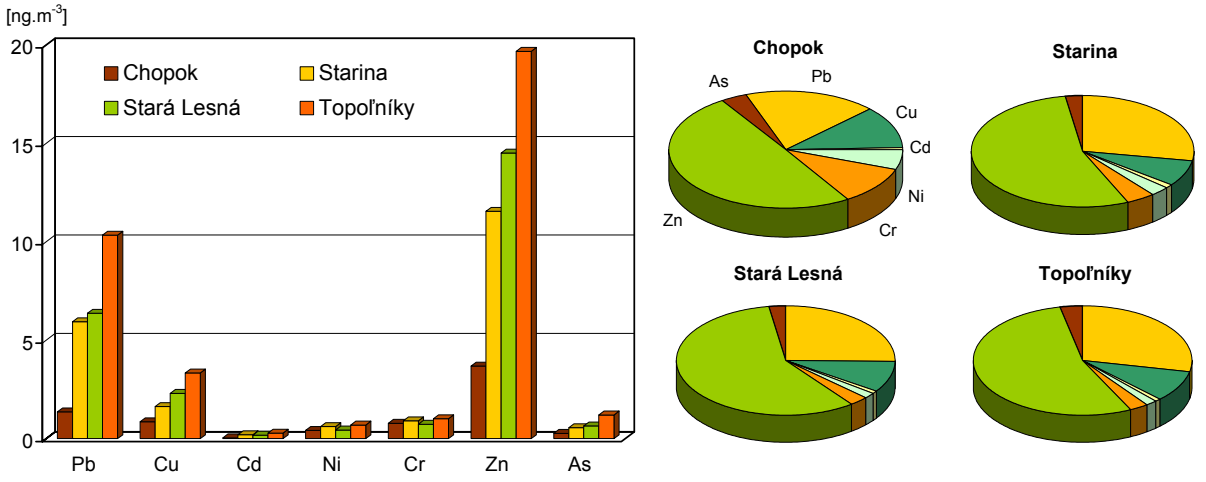
Ammonia, ammonium ions, and alkali metals

In compliance with the requirements of the EMEP monitoring strategy, measurements of ammonia, ammonium ions, and ions of sodium, potassium, calcium, and magnesium in the air at the station of Stará Lesná were initiated in May 2005. The measurements were completed in 2007. Measurements for these ions began at Starina in July 2007. For ammonia ions the annual concentration was 0.84 µg N.m^{-3} and their percentage proportion in PM was 7.1%. For ammonia, the annual concentration is 0.27 µg N.m^{-3} and the ratio of the ammonia ions and ammonium concentration expressed in nitrogen is 3.1.

Atmospheric aerosol, heavy metals

Percentage share of the sum of assessed heavy metals on air-borne dust at regional stations of Slovakia varies between 0.14 and 0.19%.

Heavy metals in the air and percentage share of heavy metals in 2010



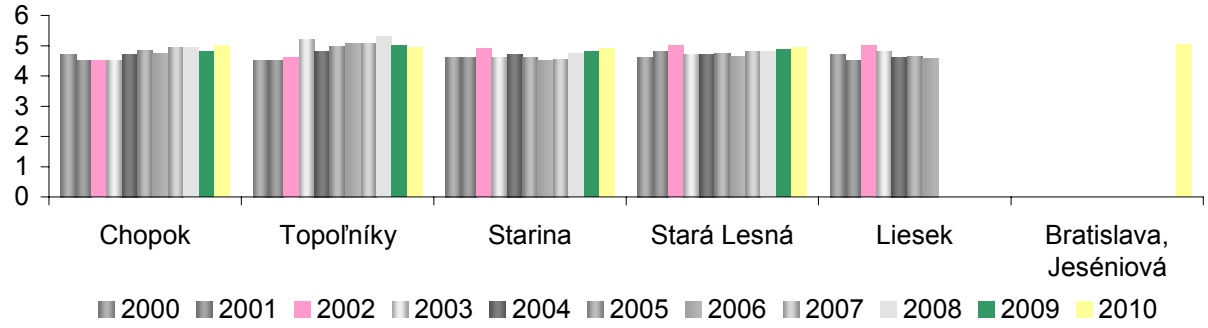
Source: SHMI

Atmospheric precipitations

Beside the 4 EMEP stations, the quality of rainfalls is also measured at the Bratislava-Jeséniova station, which serves only for the purposes of making comparisons with the regional stations.

In 2010, total atmopheric precipitations at regional stations were between 926.3 and 1 377.4 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 4.9-5.0. Time sequence and pH trend over a longer time period show a reduced acidity.

Trend of pH precipitation



Source: SHMI

Concentrations of dominant sulphates in precipitation water showed the interval of 0.39-0.45 mg.l^{1}. Sulphates concentrations measured at two stations - Chopok and Starina, are the same for the annual average values; they have been slightly lower at Stará Lesná and little higher at Topoľníky. The overall reduction in sulphate concentrations over a long period corresponds to the reduction of SO_2 emissions since 1980.

Nitrates that show less influence on the acidity of precipitations than sulphates showed the concentration interval of 0.23-0.37 mg N.l^{-1}. Chopok and Stará Lesná represent the lower limit of the span, while Topoľníky forms the upper limit. Ammonium ions also belong to the major ions and their concentration span has been 0.28-0.44 mg.l^{-1}.

Annual averages of heavy metals in monthly precipitation - 2010

Station	Precip. mm	Pb µg/l	Cd µg/l	Ni µg/l	As µg/l	Zn µg/l	Cr µg/l	Cu µg/l
Chopok	1 145	1.86	0.07	0.33	0.19	23.71	0.16	0.94
Topoľníky	873	0.95	0.04	0.25	0.13	5.71	0.22	0.63
Starina	967	0.96	0.05	0.42	0.10	10.6	0.09	0.95
Stará Lesná	1 027	1.27	0.10	0.30	0.12	9.94	0.08	1.23
Bratislava, Jeséniova	1 071	1.66	0.07	0.46	0.18	17.24	0.18	2.10

Source: SHMI

Tropospheric ozone

Average annual concentrations of ground ozone in Slovakia in contaminated urban and industrial locations in 2010 were within the interval of 44-87 µg.m^{-3}. Greatest average annual ground ozone concentrations in 2010 were recorded at the Chopok station (87 µg.m^{-3}).

Target value for ground ozone concentration in terms of public health protection is set by the MoE SR Resolution No. 360/2010 Coll. on air quality at 120 μg.m^{-3} (max. daily 8-hour value). Alert threshold (240 μg.m^{-3}) for warning the public was exceeded in 2010 at the station in Bratislava-Jeséniova. Information threshold (180 μg.m^{-3}) for informing the public has been exceeded at two stations (Bratislava-Jeséniova, and Bratislava-Mamateyova).

Number of days with exceeded target value for protection of public health - 2008, 2009, 2010, average for 2008-2010

Station	2008	2009	2010	Averaged in 2008-2010
Bratislava, Jeséniova	32	24	24	29
Bratislava, Mamateyova	24	22	21	22
Košice, Ďumbierska	6	106	14	42
Banská Bystrica, Zelená	-	[b] 18	17	18
Jelšava, Jesenského	22	17	4	14
Kojšovská hoľa	39	71	[a] 55	55
Nitra, Janíkovce	-	[a] 85	[a] 16	50
Humenné, Nám. slobody	10	43	8	20
Stará Lesná, AÚ SAV, EMEP	32	15	15	21
Gánovce, Meteo. st.	14	5	7	9
Starina, Vodná nádrž, EMEP	5	22	2	10
Prievidza, Malonecpalská	13	19	9	14
Topoľníky, Aszód, EMEP	39	41	23	34
Chopok, EMEP	66	62	36	55
Žilina, Obežná	21	36	20	26

[a] 75-90 %, [b] 50-75 % 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. 360/2010 Coll. on air quality). This value applies to the concentrations calculated as the average for the period of five years. Average values for the years 2006-2010 were exceeded at all reference urban and rural stations, with the exception of Banská Bystrica, Starina, and Prievidza.

Values for the AOT 40 for vegetation protection - the year 2008 and for the averaged period of 2006-2010

Station	Averaged in 2006-2010	2010
Bratislava, Jeséniova	22 499	21 253
Bratislava, Mamateyova	18 991	14 712
Košice, Ďumbierska	20 482	12 496
Banská Bystrica, Zelená	16 144*	15 110
Jelšava, Jesenského	18 081	8 542
Kojšovská hoľa	25 822	23 077
Nitra, Janíkovce	22 550*	12 991
Humenné, Nám. slobody	21 806	9 606
Stará Lesná, AÚ SAV, EMEP	18 007	12 894
Gánovce, Meteo. st.	18 185	12 786
Starina, Vodná nádrž, EMEP	12 823	5 107
Prievidza. Malonecpalská	14 734	11 874
Topoľníky, Aszód, EMEP	23 245	16 764
Chopok, EMEP	28 096	20 815
Žilina, Obežná	20 044	16 248

** the station did not measure data for enough years*

Source: SHMI

The reference AOT 40 value for the protection of forests for annual reporting to EC is 20 000 $\mu g.m^{-3}.h$, 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. In 2010, this value was not exceeded at 3 stations.

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). Since January 1, 2010, a new Regulation (EC) No 1005/2009 of the European Parliament and of the Council on substances that deplete the ozone layer.

♦ Consumption of controlled substances

Sovakia 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 (t)

Group of substances	1986/ 1989#	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
AI - freons	1 710.5	4.1	0.996	0.81	0.533	0.758	0.29	0.43	0.46	0.34	0.49
A II - halons	8.1	-	-	-	-	-	-	-	-	-	-
BI* - freons	0.1	-	-	-	-	-	-	-	-	-	-
B II* - CCl_4	91	0.03	0.01	0.009	0.047	0.258	0.045	0	0.016	0.099	0.119
BIII* - 1,1,1	200.1	-	-	-	-	-	-	-	-	-	-

trichloroethane											
C I*	49.7	66.8	71.5	52.91	38.64	48.76	43.94	41.32	34.35	31.12	0.578
C II - HBFC22B1	-	-	-	-	-	-	-	-	-	-	-
E - CH_3Br**	10.0	0.48	0.48	0.48	0.48	-	-	-	-	-	-
Total	2 019.5	71.4	72.986	54.21	39.7	49.78	44.28	41.75	34.83	31.56	1.187

Initial usage
Source: MoE SR
∗ Initial year 1989
∗∗ Initial year 1991
***Note 1**: 0.48 tons of methyl bromide were imported in 2001-2004 for Slovakofarma as a raw material for the production of medications, which is not considered as consumption, according to the valid methodology.*
***Note 2**: Consumption of C1 substances in 2010 represents the import of regenerated R22. As from January 1, 2010, Regulation no. 1005/2009/EC allows to introduce to the market and use only recycled or regenerated substances for the maintenance and service of mechanisms; import, introduction and use of pure C1 substances is prohibited.*

Usage of substances under control in 2010 (t)

Usage	**Group of substances**							
	AI	A II	BI	B II	BIII	C I	C II	E
Coolant						0.578		
Detection gases, diluents, detergents	0.49			0.119				

Source: MoE SR

♦ Total atmospheric ozone and ultraviolet radiation

The average annual value of total atmospheric ozone in 2010 was 346.3 Dobson units (D.U.), which is 2.4% above 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 devations within 2010

Month	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Year**
Average (DU)	365	377	394	396	360	344	335	310	315	307	306	349	**346.3**
Deviation (%)	7	2	3	3	-3	-4	-2	-4	4	7	6	13	**2.4**

Source: SHMI

• WATER

Key questions and key findings

♦ Key questions

- What is the situation and trend in the use of water in terms of preserving the water sources?
- Has there been a reduction to the pressure on the surface water quality expressed by the volume of pollution discharged into surface water?
- What is the quality of water in Slovakia?
- What is the trend in connectedness of the public to public water supplies and sewerage systems?

♦ Key findings

- In 2010, there was an increase in surface water abstraction by almost 60%, compared to the previous year. Significant increase was detected in the category of industry. In terms of comparing the long-term trends (2000 - 2010), decreasing trend was recorded until 2007, which was followed by a period of increase in 2008, decrease in 2009, and another increase in 2010. Abstractions in 2010 represented approximately 60% of all abstractions in 2000.
- Ground water abstractions in 2010 dropped by 2.04%, compared to 2009. This points to a continuing long-term trend in ground water use. Ground water abstractions in 2010 represented a reduction in yearly abstracted volumes by 24%, compared to the abstractions in 2000.
- In 2010, 20% more waste water was discharged into surface water than in 2009. From the perspective of long-term trend we can see a reduction in waste water in 2010 by 40% compared to 2000 with a significant change in the proportion of treated to untreated waste water discharged into watercourses with a significant reduction in waste water contamination.
- Surface water quality at all monitoring sites complied with the limits for selected general indicators and the radioactivity indicators. Exceeded limit values were recorded mainly for synthetic and non-synthetic substances, hydrobiological and microbiological indicators, and nitrite nitrogen.
- Condition of surface water formations was classified as adverse and critically adverse in 3.4% of water formations, reaching the length of 1 179.95 km. 86 water formations (5%) do not show favourable chemical balance.
- Monitoring for ground water chemical balance in 2010 was carried out within the framework of basic monitoring (175 objects) and operational monitoring (211 objects). Both types of monitoring showed exceeded values for set contamination limits.
- Drinking water quality has long been of the high level. In 2010, the share of favourable drinking water analyses for compliance to limit values reached 99.39%.
- Altogether, of 38 swimming areas, 94.4% (34 swimming recreational areas) which complied with the bathing water quality criteria. This represents an increment of 3%, compared to the previous year. 15 bathing sites complied with the recommended limit values, which is 41.7% and represent a reduction by 46.5%. In 2010, Delňa was the only water formation classified in the system of European monitoring that was assessed as a site that does not comply with the criteria of the Directive on recreational water. This was due to a high concentration of Escherichia coli. Bathing prohibition was issued for one recreational site, Zemplínska Šírava - Hôrka, due to exceeded values for the following indicators: intestinal enterococci, E.coli, and coliform bacteria.
- Number of inhabitants connected to drinking water from public water supplies reached 86%. This value does not reach the values shown by the neighbouring countries.
- Number of inhabitants connected to public sewerage systems reached 60.4%. This level is comparable to Hungary, Poland; however, it is significantly lower than that of the Czech Republic and Austria.

Surface water

♦ Water balance

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.

Annual inflow to Slovakia in 2010 was 71 810 mil.m^3, which was abreast of the previous year 2009. **Runoff** from the territory has grown by 12 978 mil.m^3, compared to the previous year.

Total water volume as of 1.1.2010, in water reservoirs was 931 mil.m^3, which represented 80% of total usable water volume in water reservoirs. As of 1.1.2011, total available volume of the assessed accumulation tanks compared to the previous year 2010 incerased to 1 003.3 mil.m^3, which represents 86% of total exploitable water.

Total hydrological balance of water resources in the SR

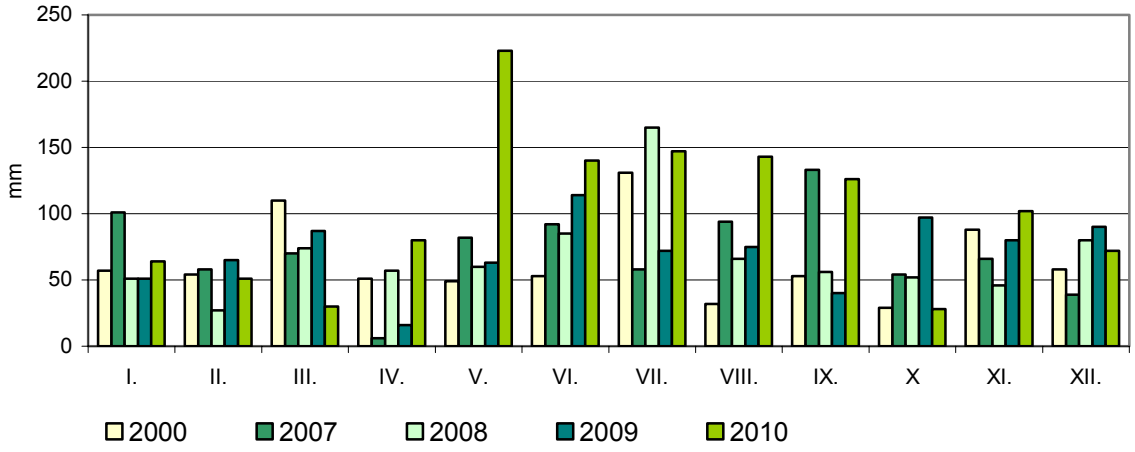
	Volume (mil. m^3)		
	2008	**2009**	**2010**
Hydrological balance			
Rainfall	40 049	41 715	59 117
Annual inflow to the SR	69 005	71 767	71 810
Annual runoff	73 387	85 546	98 524
Annual runoff from the territory of the SR	10 146	10 382	22 939
Water management balance			
Total abstraction of the surface and ground water in the SR	664.6	627.81	602.27
Evaporation from water reservoirs and dams	51.9	61.68	48.08
Discharge into surface waters	608.9	605.27	698.49
Impact of water reservoirs (WR)	12.6	123.27	72.00
	accumulation	**accumulation**	**accumulation**
Total volume in WR as of 1st January of the following year	809.4	931.1	1 003.3
% of supply volume in accumulation WR in the SR	70	80.30	86.0
Rate of water exploitation (%)	6.55	5.80	2.63

Source: SHMI

♦ Precipitation and runoff conditions

Total **atmospheric precipitations** in the Slovak territory in 2010 reached the value of 1 206 mm, which represents 158% of the normal level. In terms of precipitations, this year had been considered exceptionally humid. Total excess of precipitations reached the value of 444 mm.

Average monthly precipitation in the area of the SR in 2000 and 2007- 2010



Source: SHMI

In 2010, based on the rainfall indicators, all Slovakian watersheds were exceptionally humid when expressed in % (144 to 185% of the corresponding normal values). The lowest volume of precipitations expressed in % was shown for the Morava region. (144% of the corresponding normal values, which is 983 mm).

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)	983	954	1 243	1 081	1 294	1 183	1 285	1 253	1 153	1242	1 371	1 206
% of normal	144	152	147	156	164	173	163	185	164	170	163	158
Character of rainfall period	MV	MV	MV	MV	MV	MV	MV	MV	MV	MV	MV	MV
Annual runoff (mm)	220	48	510	279	554	383	520	544	472	494	630	468
% of normal	167	133	161	195	192	282	275	259	159	301	183	179

* 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

Average annual run-off from the Slovak territory was 468 mm, which is 179% of the long-term normal value. In individual partial watersheds, the run-off values fluctuated between 48 mm (partial Danube watershed) and 630 mm (watersheds of Poprad and Dunajec). The lowest percentage of normal values was recorded for the Danube watershed (1.33%), the highest percentage of normal values was shown for the Bodrog watershed (301%).

♦ Surface water abstraction

In 2010, surface water abstractions increased to 446.7 mil.m^3, which is 59.6% more than in the previous year. Abstractions for industry in 2010 were at 392.7 mil. m^3, which was a significant growth by 176.3 mil.m^3, i.e. 81.5%, compared to 2009. A slight reduction was recorded also in surface water

abstractions for waterlines, which, compared to the previous year, dropped by 2.8 mil.m^3, that is 5.6%. Surface water abstractions for irrigation grew and reached the value of 5.8 mil.m^3.

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

Year	Public water-supplies	Industry	Irrigation	Other agriculture	Total	Discharging
2000	70.571	575.872	90.540	0.0440	737.027	989.825
2008*	52.057	251.797	9.133	0.0040	312.991	608.997
2009*	51.045	216.397	12.319	0.0020	279.763	605.271
2010*	48.200	392.700	5.800	0.0000	446.700	744.600

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

♦ Surface water quality

Surface water quality assessment has been carried out on the basis of data obtained during the water level monitoring process. In 2010, surface water quality monitoring in the Slovak Republic was divided by the **MoE SR Resolution 418/2010 Coll. on implementation of selected provisions of the Water Act** into basic monitoring, operational monitoring, and monitoring of protected areas (PA). Quality surface water indicators in 2010 were monitored in compliance with the approved Programme of Water Balance Monitoring for 2010. 277 sites were monitored under the basic and operational monitoring schemes.

The number of monitored surface water sampling sites in 2010

Sub-basin	The number of monitoring sites per type of monitoring		
	Basic	Operational	Basic and Operational
Morava	8	12	8
Dunaj	11	2	4
Váh	19	64	15
Hron	3	26	7
Ipeľ	6	18	2
Slaná	1	8	4
Bodrog	8	14	2
Hornád	3	16	2
Bodva	-	2	3
Dunajec and Poprad	4	4	1
Total	**63**	**166**	**48**

Source: SHMI

Quality indicators monitored at all monitoring sites (basic and operational) in 2010 were assessed pursuant to the **SR government Regulation 269/2010 Coll. which sets forth criteria for achieving a favourable water balance.** General requirements for surface water quality were met at all monitoring sites for the following indicators: **general indicators** (part A) - total organic carbon, dissolved substances (dried as well as annealed), magnesium, sodium, chlorides, free ammonia, organic nitrogen, surface active substances, non-polar extractable substances (UV, IR) phenolic index, chlorobenzene, dichlorbenzenes. Also, **radioactivity indicators** complied with the requirements (part D): bulk volume alpha and beta activity, tritium, stroncium, and caesium.

Surface water quality criteria were exceeded in the **synthetic substances** category (part B) by the indicators for arsenic, cadmium, copper, lead, zinc. In the category of **non-synthetic substances** (part C) the following substances did not comply with the criteria for the annual average: atrazine, di-(2-ethyl hexyl) phtalate (DEHP), fluoranthene, naphtalene, 4-nonylphenol, tetrachloroethylene, trichloromethane, cyanides, and 4-methyl-2 6-di-tert-butylphenol. **Hydrobiological and microbiological indicators** (part E) included the bioseston saprobic index, abundance of phytoplankton, chlorophyll a, coliform bacteria, thermotolerant coliform bacteria, intestinal enterococci. Nitrite nitrogen indicator has often been exceeded in all partial watersheds for the **general indicators** group. Most exceeded criteria in the group of hydrobiological and microbiological indicators included those for intestinal enterococci (in 7 partial watersheds), thermotolerant coliform bacteria (in 9 partial watersheds), and coliform bacteria (in 5 partial watersheds).

♦ Evaluation of status of surface water bodies

Assessment of surface water formations balance is based on the assessment of their ecological condition, i.e. their ecological potential and chemical balance.

Resulting water balance is determined by the worse of the pair of chemical or ecological balance that forms the basis for the subsequent activities relating to the compliance with one of the environmental quality goals under Framework Water Directive (FWD) - to reach a favourable water balance for all water formations by 2015.

In total, 1 760 surface water formations of Slovakia have been assessed.

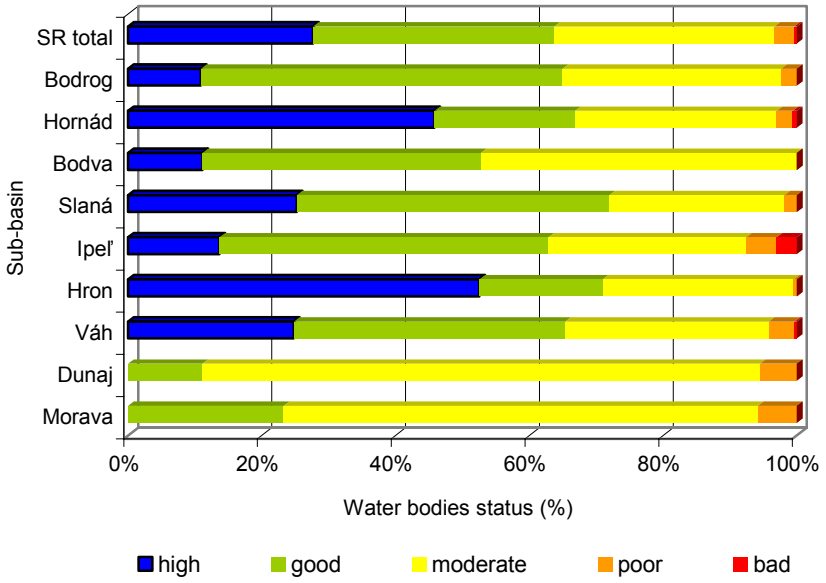
Classification of ecological status/potential of surface water bodies in SR years 2007 – 2008

	Water body status (number)				
	high	**good**	**moderate**	**poor**	**bad**
Danube River Basin District	426	630	563	51	7
Vistula River Basin District	61	5	16	1	0
SR total	**487**	**635**	**579**	**52**	**7**

Source: MoE SR

Of the total number of water formations, very favourable and favourable ecological balance/potential was shown for 63.7% of them. In terms of water formations' length, the number represents 53.9%. (10 265.44 km) A relatively high number of water formations showed average balance/potential, specifically 32.9% of them, which represents the length of 7 600.78 km. Condition of surface water formations was classified as adverse and critically adverse in 3.4% of water formations, reaching the length of 1 179.95 km.

Share of the total number of water bodies classified into the individual ecological status/potential in the river basin of SR



Source: MoE SR

Assessment of water **chemical balance** involved assessing the occurrence of 41 priority substances in surface water formations. Compliance of the outcomes of monitoring with the environmental quality standard (EQS) means compliance with the criteria for favourable chemical balance. Monitoring of priority substances in 2007 and 2008 was implemented in 132 water formations. Scope of the monitored indicators and the frequency of their monitoring differed.

Based on the performed assessment, of total number of 1 760 water formations, 1 674 of them (95.0%) showed a favourable chemical balance, while 86% of them do not.

Evaluation of chemical status of water bodies per river basin district

River basin	Water bodies achieving good chemical status		Water bodies not achieving good chemical status	
	number	length (km)	number	length (km)
Morava	95	822.10	8	197.10
Dunaj	16	318.08	2	56.20
Váh	609	6 324.50	32	777.94
Hron	204	1 828.45	13	261.00
Ipeľ	124	1 517.20	8	103.30
Slaná	106	1 077.50	1	13.00
Bodva	35	309.25	1	35.80
Hornád	158	1 551.65	8	151.35
Bodrog	247	2 498.30	10	301.80
Danube River Basin District	1 594	16 246.95	83	1 897.49
Vistula River Basin District	80	786.85	3	115.10
SR total	**1 674**	**17 033.80**	**86**	**2 012.59**
	95.0%	**89.4%**	**5.0%**	**10.6 %**

Source: MoE SR

Groundwater

♦ Water resources

In 2010, based on the hydro-geological assessment and surveys in the SR, there were **78 672 l.s^{-1} available groundwater resources**. In comparison with the previous year 2009, there was observed a slight increase of the efficient groundwater volume by 115 l.s^{-1}, i.e. by 0.15%. In the long-term evaluation, the increase of the efficient volume in comparison with 1990 makes 3 897 l.s^{-1}, i.e. 5.2%.

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 **2010, out of total number of 141 hydro-geological regions in SR, 126 regions show good balance status, 14 regions show acceptable status and one region show critical status.** Emergency balancing state did not occur in any region.

♦ Groudwater levels

In 2010, compared to 2009, **average annual levels** in Slovakia showed almost consistent elevations in ground water levels. Average annual values for ground water levels grew in most instances up to + 60 cm, occasionally up to +300 cm ,in all watersheds of Slovakia, with the exception of Morava and Danube where the growth was up to +40 cm. Occasional drops of up to -10 cm occurred in the Danube watershed.

Average annual levels in 2010, compared to long-term average annual levels, almost consistently grew up to +110 cm in the whole territory, with more intensive values in the watersheds of the Central and Eastern Slovakia. Occasional reductions of up to -50 cm were recorded in the watersheds of Danube and middle and upper Váh.

♦ Well capacities

Increase, for the most part, of up to 200% in the Slaná watershed, compared to the previous year, was recorded, give the **average annual** spring **yields.** Occasional drops in the average annual yields were recorded in the watersheds of the upper Váh, Turiec, Morava, and Hornád. (from 83% to 97%).

Average annual yields compared to long-term average yields grew almost consistently up to 200% in the watershed of Slaná, and even beyond 300% of the watershed of Bodva. Occasional drops were recorded in the watersheds of Morava, Upper Váh, Orava, Turiec, Nitra, and Poprad (from 71% to 99%).

♦ Groundwater abstraction

In 2010 there was being **extracted 10 820 l.s^{-1} of ground water in average** by the users (which are subjects to reporting obligation) in Slovakia that was 13.8% of the documented efficient volume. During the year 2010 the groundwater extractions slightly decreased by 225.1 l.s^{-1} which means 2.04% in comparison with year 2009.

Groundwater extraction in 2010 according to the purpose of use ($l.s^{-1}$)

Year	Public water supplies	Food-processing industry	Other industr.	Agricult. and Livestock	Vegetable prod. Irrigation	Social purposes	Others	Total
2007	8 441.59	383.87	891.32	267.84	146.25	333.44	901.65	11 365.96
2008	8 468.82	284.98	823.02	253.29	67.52	271.23	953.23	11 122.09
2009	8 475.40	268.13	762.18	232.07	93.80	249.44	963.58	11 044.60
2010	8 295.00	265.00	781.00	217.20	48.70	254.40	967.20	10 819.50

Source: SHMI

♦ Monitoring of groundwater quality

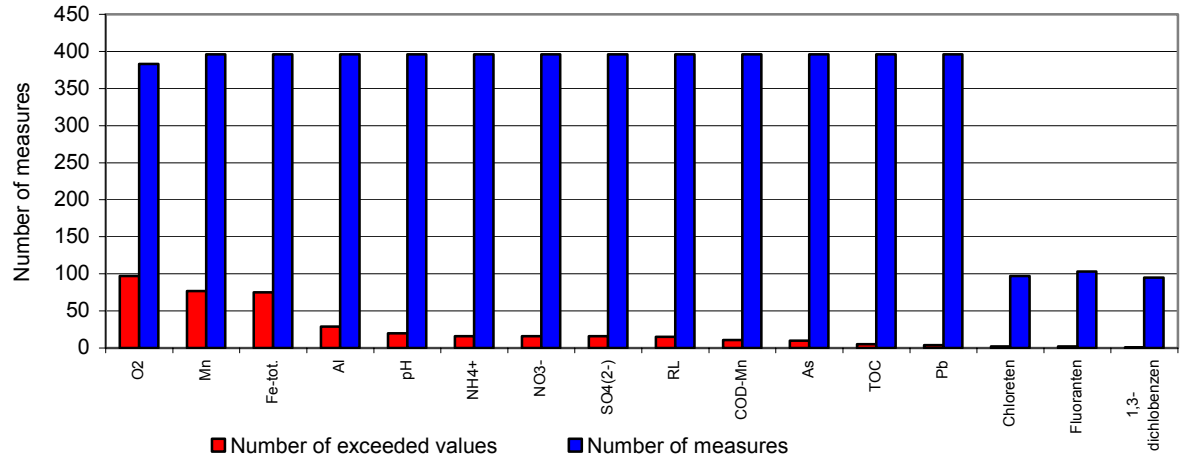
Pursuant to the WFD requirements, the older system of dividing Slovakia into significant water management areas was abandoned. Since 2007, classification has been based on delineation of groundwater formations. Monitoring of ground water chemical situation has been divided into:

- basic monitoring,
- operation monitoring.

In 2010, ground water quality was monitored at 175 basic monitoring facilities. Ground water samples were extracted 2 times from 53 quaternary objects, 1 times in 64 pre-quaternary objects, and 4 times in 56 pre-quaternary karst objects.

Adverse **oxidation-reduction** conditions dominate at ground water **basic monitoring** facilities, apparently caused by most frequent occurrences of exceeded acceptable concentrations of total Fe (75 times), Mn (77 times), and NH_4^+ (16 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, COD_{Mn} and H_2S. Most frequently recorded excessive concentrations in **trace elements** included Al (29 times), As (10 times), Pb (4 times), Sb (8 times), Hg (1 time) and Ni (1 time). Contamination by **specific organic substances** shows only local character and the majority of specific organic substances was recorded below the detection limit. In 2010 was recorded exceeding the limit values in the group of pesticides, follow in group of polyaromatic hydrocarbons, volatile aromatic hydrocarbons and group of volatile aliphatic hydrocarbons.

Occurrence of exceeded indicators at basic monitoring facilities pursuant to the SR Government Directive 496/2010 Coll. in 2010



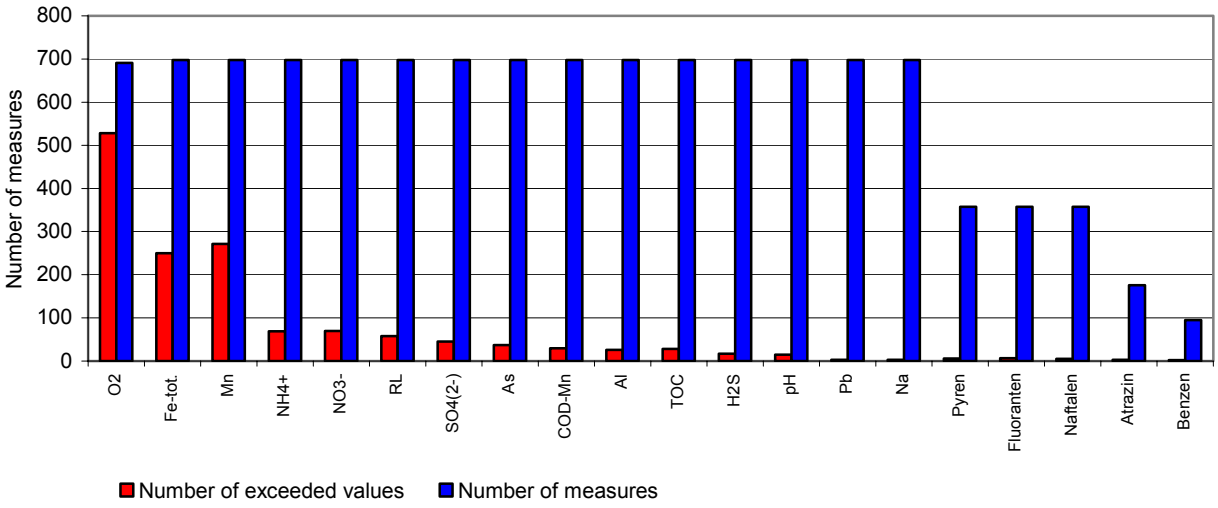
Source: SHMI

Operational monitoring was conducted at all ground water formations that were assessed as high-risk in terms of not being able to reach a favourable chemical balance. In 2010, within the operational monitoring 211 objects were monitored with the assumption to detect a potential penetration of contaminants from a potential contamination source or group into the ground water. The area of Žitný ostrov forms a separate part of the SHMI monitoring network, since it plays an important role within the whole process of water quality changes in Slovakia, and since the area itself represents a reservoir of drinking water for our territory.

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 23.59% 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. The limits for the following basic parameters were exceeded: soluble substances at 105°C (58 times), H_2S (17 times), Mg (5 times) and Na (3 times). 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^+ (69 times) and NO_3^- (70 times) being the most prevalent. In 2010, the acceptable value set by legislation was exceeded in **6 trace elements** (Al, As, Sb, Cd, Ni, and Pb) at operation monitoring facilities. Most frequently recorded increased contents include Al (26 times) and As (37 times). The impact of anthropogenic activity on groundwater quality is indicated by the increased concentration of COD_{Mn} (30 times). The limit for non.polar substances ui (NEL_{UV}) were exceeded 8 times and for TOC 18 times. The presence of specific organic substances in groundwater is an indicator of the impact of human activity. A wider range of **specific organic substances** was recorded within the operational monitoring.

The most exceeded limit values were recorded in indicators from the pesticides group (phenmedipham, S-metolachlor, desethylatrazine, bentazon, atrazine, metamitron, prometryn, propisochlor, clopyralid) and polyaromatic hydrocarbons (fluoranthene, naphtalene, phenanthrene, chrysene, acenaphtene, b(a,h)anthracene). Exceeded were also the limit values in the group of volatile aromatic hydrocarbons and volatile aliphatic hydrocarbons.

Occurrence of exceeded indicators at operation monitoring facilities pursuant to the SR Government Directive 496/2010 Coll. in 2010



Source: SHMI

♦ The groundwater status assessment

75 water formations have been designated in Slovakia (16 quaternary and 59 pre-quaternary) that were in 2010, with the exception of 2 pre-quaternary formations.

Objects were assessed for each water formation based on compliance to the Slovak Government Resolution no. 496/2010 Coll. which amends Slovak Government Resolution no. 354/2006 Coll. **which sets forth criteria for water for human consumption and its quality assessment.** Objects showing the exceeded threshold value set by legislation by at least one indicator were labelled as unfavourable.

On the basis of assessment of the ground water chemical balance, of the total number of 75 ground water formations:

- 13 ground water formations were declared as those with unfavourable chemical balance - 7 quaternary and 6 pre-quaternary
- 62 ground water formations were declared as those with favourable chemical balance.

Summary of chemical status evaluation in the groundwater bodies in SR

SR water bodies	Chemical status classification				Total area
	good		poor		
	km^2	%	km^2	%	
Quaternary	6 081	57.1	4 565	42.9	10 646
Pre - quaternary	39 446	80.5	9 536	19.5	48 982
SR total	**45 527**	**76.4**	**14 101**	**23.6**	**59 628**

Source: MoE SR

Favourable chemical balance was indicated for 82.7% of groundwater formations, i.e. 76.4% of total size of formations (quaternary and pre-quaternary). Favourable chemical balance was indicated for 17.3% of groundwater formations, i.e. 23.6% of total size of formations (quaternary and pre-quaternary).

Quantitative balance of groundwater formations involves assessing the impact of the documented phenomena on the groundwater formation as such. In Slovakia, this involves assessing the impact of groundwater abstractions. For the purposes of assessment of the quantitative balance of groundwater formations within quaternary sediments and pre-quaternary rocks, outcomes of four assessments have been summarised. 5 groundwater formations in the territory of the Slovak Republic have been classified as having an adverse quantitative balance.

Waste water

In 2010, 744 756 thous.m^3 of **waste water** were discharged into the surface water, which represents a growth by 124 416 thous.m^3 (20.0%) compared to the previous year. When compared with 2000, it is less by 302 925 thous.m^3 (40.1%)

Volumes of organic pollution in the surface water characterised by the oxygen demand parameters: chemical oxygen demand by dichromate (CODcr) and biochemical oxygen demand (BOD) remained at the level of last year. The indicator for insoluble substances (IS) recorded a more significant growth by 1 311 thous.t. per year.

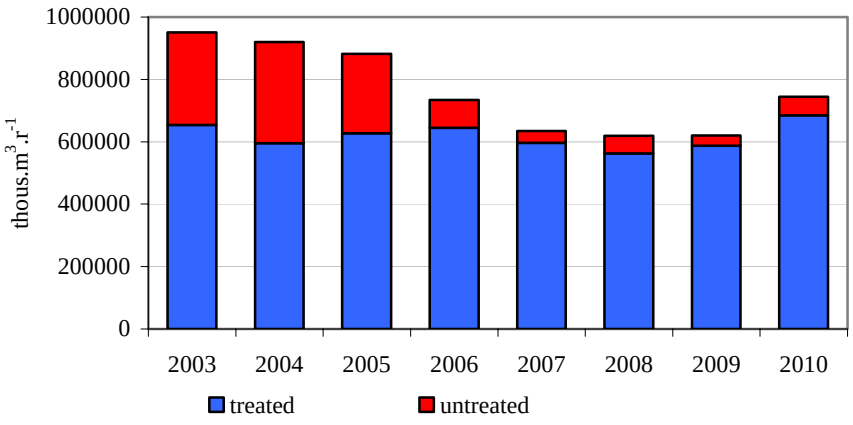
Percentage of discharged treated waste water to **total volumes of waste water** discharged into watercourses in 2010 was 91.94%.

Load of the balanced contamination sources discharged into surface watercourses in the period of years 2000-2010

Discharged waste water	Volume (thous.$m^3.y^{-1}$)	IS ($t.y^{-1}$)	BOD_5 ($t.y^{-1}$)	COD_{Cr} ($t.y^{-1}$)	NES_{uv} ($t.y^{-1}$))
2000	1 047 681	23 825	20 205	61 590	298
2007*	634 419	9 405	6 521	26 913	58
2008*	619 286	8 736	6 641	26 688	31
2009*	620 340	7 707	5 546	25 660	31
2010*	744 756	9 018	5 580	25 750	32

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

Trend in discharging of the treated and untreated waste waters into watercourses in the period of 2003-2010



Source: SHMI

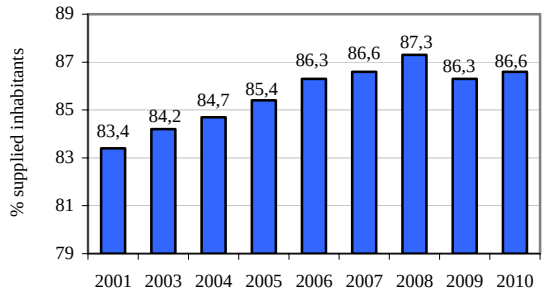
Public water supplies, sewerage lines, and wastewater treatment plants

♦ Public water supplies

Number of inhabitants supplied with drinking water from the public water supply in 2010, reached the number of 4 705 thousand, which represented 86.6% of supplied inhabitants. There were in the SR 2 297 individual municipalities that were supplied with public water supply, and their portion on total SR municipalities was 79.5%.

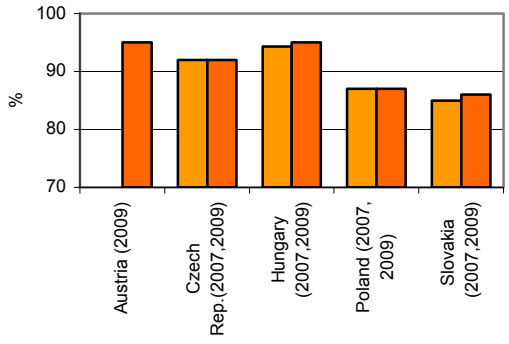
In 2010, major changes were registered in drinking water abstraction. **Volume of produced drinking water** reached the value of 313 mil. m^3 of drinking water, which, compared to 2009, represents a reduction by 1 mil. m^3. Of all groundwater sources, 267 mil.m^3 was produced (increased by 3 mil.m^3), while 46 mil.m^3 of drinking water was produced of all surface water sources (reduction by 4 mil.m^3) Of total water produced at water management facilities, **water losses** by pipe network were 27.6% in 2010. **Specific water consumption by households** decreased to 83.4 l per person per day. This is alarming not only due to the fact that these abstractions are close to the sanitary limits, but mainly because the high drinking water prices motivate the people to build their own drinking water sources whose drinking water quality is, in most cases, far below the sanitary standards.

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



Source: SO SR, VRI

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

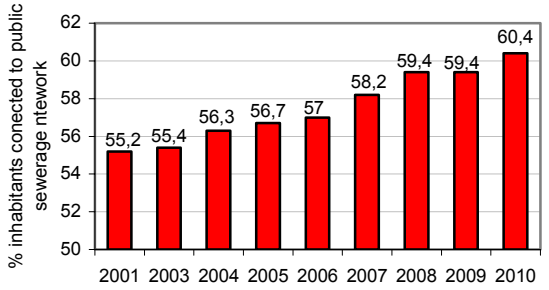


Source:Eurostat, SO SR

♦ Sewerage system

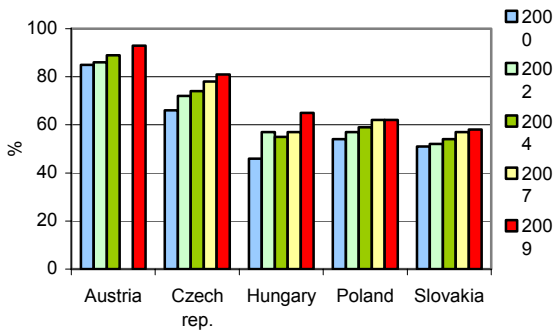
Development of public sewerage systems lags behind that of public water supplies. **Number of inhabitants** living in households **connected to public sewerage systems** in 2010 reached the number of 3 282 thous. inhabitants, which is 60.4% of all inhabitants. Of the number of 2 891 of stand-alone municipalities in 2010, 908 of them had public sewerage systems in place (i.e. 31.4% of all Slovak municipalities).

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



Source: SO SR, WRI

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



Source: Eurostat

♦ Waste water treatment plants

In 2010, 607 waste water treatment plants were in the Administration of water supplies and water sewerage systems (VaK) scheme, of which greatest share had mechanical-biological WWTPs (93.5%). WWTP's capacity was reaching the value of 2 196.9 $m^3.day^{-1}$ in 2010.

In 2010, watercourses with public sewerage system (administered by municipalities and water management companies) received 507 mil.m^3 of discharged waste water, which was by 80 mil.m^3 more than in the previous year, and the volume of treated waste water discharged into the public sewerage system reached 497 mil.m^3.

Volume of the discharged wastewater by the public sewerage system (in administration of VaK and in administration of the municipalities) in 2010

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	113 762	92 514	61 125	229 638	0	497 039
Untreated	3 084	776	1 946	4 217	0	10 023
Total	116 846	93 290	63 071	233 855	0	507 062

Source: WRI

Sludge from WWTPs is a necessary by-product of the waste water treatment process. Sludge volumes produced in Slovakia at WWTPs operated by regions or water management companies remained virtually unchanged, with fluctuations within 53 - 58 thous. tonnes of sludge dry matter.

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	
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
2008	57 810	0	0	38 368	0	8 676	0	10 766
2009	58 582	0	0	47 056	0	2 696	0	8 830
2010	54 760	923	0	35 289	0	16	0	6 681

Source: WRI

Drinking water

♦ Drinking water quality monitoring and assessment

Drinking water indicators are defined under the **SR Government Regulation 354/2006 Coll.,** which stipulates requirements on water designated for human consumption and its quality control. Water quality control for radioactivity follows the **Resolution of the Ministry of Health no. 528/2007 Coll.** which stipulates details on requirements to limit the level of irradiation from natural radiation.

Besides the **complete water analysis**, the implemented **minimum analyses** - e.g. analyses of 28 water quality indicators, is carried out to monitor and obtain periodic information on the stability of water bodies and effectiveness of water treatment, mainly water desinfection, biological quality and the sensoric properties of drinking water.

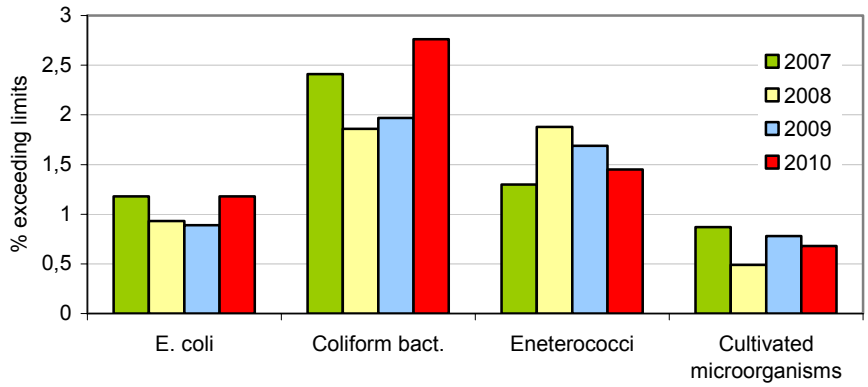
In 2010, were analysed at operation laboratories of water management companies 8 542 samples. The samples were abstracted at sites located within distribution networks and 246 263 analyses were carried out to monitor individual drinking water quality indicators. Share of drinking water analyses that complied with the sanitary limits in 2010 reached 99.39% (in 2009 it was 99.46%). Percentage of samples that meet drinking water quality demands for all indicators reached 90.51% (in 2009 it was 91.20%). 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 SR Government Resolution no. 354/2006 Coll. on demands on drinking water and drinking water control

	2008	2009	2010
Share of drinking water samples that do not meet the NMH and MHRR limit.	2.34%	1.77%	2.03%
Share of drinking water quality indicators analyses that do not meet NMH and MHRR	1.02%	0.88%	0.87%
NMH - maximum threshold values, MHRR – threshold values of the reference risk			

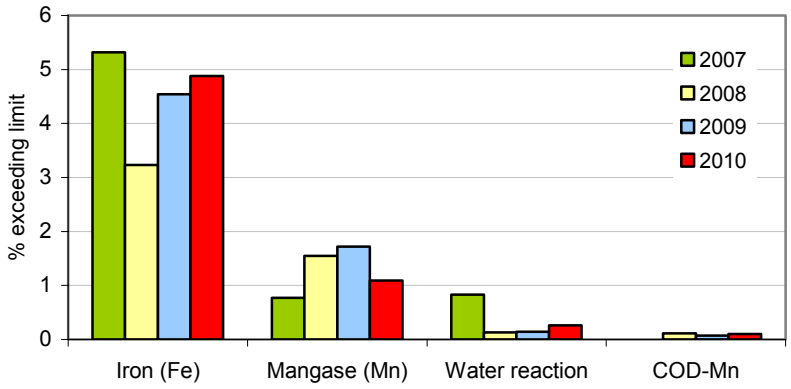
Source: WRI

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 - indicators that cannot adversely affect drinking water sensorial quality



Source: WRI

Bathing water

♦ Bathing water quality

Through **Act no. 355/2007 Coll. on protection, support and promotion of public health and amendments to other laws as amended by Act no. 140/2008 Coll., as well as through the Slovak Government Regulation no. 87/2008 Coll. on requirements on natural recreational water formations**, the Slovak Republic designated a responsibility for carrying out monitoring of water formations appropriate for bathing for the National and Regional Public Health Authority of the Slovak Republic and for site operators, in line with the appropriate frequency and methods set forth by Directive 2006/7/EC concerning the management of recreational water quality.

The assessment included 77 natural sites - gravel pits, sand pits, and enclosed water tanks used for a number of purposes, including recreation. Of this, recreational activities are organised at 18 sites and

their operation was licensed by the Regional Public Health Authority. Some sites host so-called partially organised recreational activities, i.e. only the surrounding beaches were operated excluding the water surface, or the municipality and the operators of facilities on the surrounding beaches co-administered the water surface. At other sites there were unorganised recreational activities, which monitoring by the Regional Public Health Authority was carried out in relation to the number of visitors and the actual situation. In 2010, 36 monitored natural sites in Slovakia were declared by generally binding resolutions issued by Regional Environmental Offices as those with water suitable for bathing. Frequency in water quality monitoring was roughly every other week and depended on the site's significance.

Over the season, 531 water samples were extracted and 6 883 tests were done on chemical, physical, microbiological, and biological water quality indicators. Limit value (LV) for set indicators was exceeded for 241 samples and in 373 indicators, which is 45.39% of total number of samples. (increased by app. 7%, compared to the previous year). When assessed by indicators, proportion of non-compliant indicators is only 4.81%, since with almost each non-compliant sample only one water quality indicator was exceeded. A number of water surfaces showed physical and chemical indicators that were impacted by weather conditions. These represented 80.4% of total number of non-compliant indicators. Most frequently occurring physical and chemical indicators included: transparency, colour, total phosphorus, water reaction, phenols, and less frequently total nitrogen and water oxygen saturation. The greatest number of non-compliant microbiological indicators included intestinal enterococci, less E. coli, and occasional coliform bacteria. Notwithstanding the occasionally exceeded limit values for microbiological and biological indicators, over this year's recreation season no diseases or health complications have been detected that would relate to bathing at a natural bathing water surface.

• ROCKS

Key questions and key findings

♦ Key questions

- **What is the trend in the development of geological hazards that threaten the natural environment and ultimately also the humans?**

♦ Key findings

- **Large number of newly formed accidental landslides occurred due to extremely intensive precipitations in 2010.**
- **Extreme precipitations have negatively impacted also the condition of already existing slides and slope deformities.**
- **In terms of long-term stability, there is an increased risk of damage to the physical stability of the sludge beds of Slovinky and Nižná Slaná.**
- **Adverse situation in environmental pollution remains at the sites monitored within the subsystem of environmental loads of Anthropogenic sediments character, as well as at other sites classified into the system of monitoring the impact of mineral extraction on the environment.**
- **Alluvial sediments of the rivers of Váh (upper and lower region), Hron (upper region), Muráň, and Danube together with the majority of water courses of the East-Slovakian lowland and the adjacent territories are in fact free of contamination, and concentrations of substances represent mainly their natural contents. Sediments of selected profiles of the Rivers of Nitra, Štiavnica, Hornád, and Hnilec show significant and permanent contamination.**

Geological environmental factors

In 2010, monitoring of three basic land movements was implemented within this subsystem - slides (14 monitored sites), creeps (4 sites), and signs of falls activation (10 sites). Sites within the Stabilisation embankment in Handlová and the projected territory of the PVE Ipeľ represent a special group of specific cases for the assessment of the environment stability.

In 2010, 5 878 tele-seismic, regional, or local seismic phenomena were interpreted on the basis of records of seismic stations More than 26 000 seismic phases were determined on the seismic records. 80 - 90 earthquakes were localised with the epicentre in the focal area of the Slovak Republic.

With regard to the type of environmental threat in 2010, environmental monitoring of landfills and sludge beds was implemented (the sites of Bojná, Myjava, Surovín, and Holíčov hill), Šulekovo, Krompachy - Halňa, Zemianske Kostoľany - Chalmová, Poša, Modra, Hrabovčík, and Uzovská Panica) along with geotechnical passportisation and the assessment of sludge beds. Sites in the territory of **ore deposits** (Rudňany, Slovinky, Smolník, Novoveská Huta and Rožňava, Pezinok, Kremnica, Špania Dolina, Dúbrava, Nižná Slaná and Banská Štiavnica ore deposits) were monitored in 2010, along with the sites in the areas of **magnesite and talc extraction** (Jelšava, Lubeník, Hnúšťa - Mútnik and Košice - Bankov) and **brown coal extraction** (Mines of the Horná Nitra region).

Geothermal energy

At present, there are 26 designated geothermal areas in Slovakia, taking up 27% of the state's territory. So far, 124 geothermal wells have been made in these designated areas and 1 835 l/s of water with the outflow temperature of 18 - 129°C were analysed. Geothermal water was detected through boreholes of the depth of 92 - 3 616 m. Thermal output of geothermal water at these wells, at using the reference temperature of 15°C, is 313.83 MWt, which represents 5.6% of total above-mentioned geothermal energy potential of Slovakia.

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 (state to the date 31st December 2010)

Type of abandoned mine	
Mining shaft	5 561
Pit (hole)	695
Chute	65
Cut, excavation	133
Pingo	3 988
Pingo field	107
Pingo draw	130
Dump	6 646
Old randing	204
Sink mark	281
Placer	26
Tailings dump	53
Other	146
Total	**18 035**

Source: SGI DS

Minerals deposits balance

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 2008, there were 44 survey areas and 50 registered proposals to designate a survey area. As of December 31, 2008, there were 157 recognised areas.

Energy deposits (state to the date 31st December 2010)

Raw material	Number of deposits included into balance	Number of free balance deposits	Number of deposits for mining	Unit	Balance deposits free
Anthracite	1	-	thous. t	2 008	8 006
Bitumen sediments	1	-	thous. t	9 778	10 795
Brown coal	11	4	thous. t	118 599	469 211
Flammable natural gas – gasoline gas	9	2	thous. t	202	398
Lignite	8	1	thous. t	111 535	618 665
Non-resinous gases	1	-	mil. m^3	680	1 360
Underground stores of natural gas	12	1	mil. m^3	133	5 373

Crude oil non-paraffinic	3	-	thous. t	1 632	3 422
Crude oil - semi-paraffinic	8	4	thous. t	129	6 367
Uranium ores	2	-	thous. t	1 396	5 272
Natural gas	35	12	mil. m^3	7 919	24 520
Total	**91**	**24**		**-**	**-**

Source: SGI DS

Ore deposits (state to the date 31st December 2010)

Type of ore	Number of deposits included into balance	Number of deposits for mining in 2005	Unit	Balance deposits free	Geological deposits
Sb ores	9	0	thous. t	85	3 291
Complex Fe ores	7	0	thous. t	5 751	57 762
Cu ores	10	0	thous. t	-	43 916
Hg ores	1	0	thous. t	-	2 426
Poly-metallic ores	4	0	thous. t	1 623	23 671
Wolfram ores	1	0	thous. t	-	2 846
Gold and silver ores	12	1	thous. t	58 334	172 605
Fe ores	2	0	thous. t	14 476	18 743
Total	**46**	**1**		**80 269**	**325 260**

Source: SGI DS

Non-metallics deposits (state to the date 31st December 2010)

Minerals and minerals based products	Number of deposits included into balance	Number of deposits for mining	Unit	Balance deposits free	Geological deposits
Anhydride	7	1	thous. t	658 908	1 250 101
Baryte	6	1	thous. t	9 203	12 653
Bentonite	23	7	thous. t	34 758	47 906
Cast basalt	5	1	thous. t	22 563	39 738
Decorative rock	22	2	thous. m^3	11 811	26 193
Diatomite	3	0	thous. t	6 556	8 436
Dolomite	21	8	thous. t	645 284	671 751
Precious stones	1	-	ct	1 205 168	2 515 866
Graphite	1	-	thous. t	-	294
Halloysite	1	-	thous. t	-	2 249
Rock salt	4	-	thous. t	838 697	1 349 679
Kaolin	14	-	thous. t	50 891	59 778
Ceramic clays	38	6	thous. t	117 778	192 661
Quartz	7	-	thous. t	301	327
Quartzite	15	-	thous. t	17 448	26 950
Magnesite	10	3	thous. t	757 337	1 159 843
Talc	5	1	thous. t	93 706	242 171
Mineralized I - Br waters	2	-	thous. m^3	3 658	3 658
Pearl stone	5	1	thous. t	30 164	30 484
Pyrite	1	-	thous. t	-	14 839
Gypsum	6	1	thous. t	49 192	93 428
Sialitic raw material	5	2	thous. t	109 021	122 384
Glass sands	4	2	thous. t	410 742	589 468
Mica	1	-	thous. t	14 073	14 073
Building rock	133	85	thous. m^3	637 959	756 272
Gravel sands and sands	23	11	thous. m^3	145 491	164 577
Brick clay	38	7	thous. m^3	96 322	118 944
Techn. usable miner. crystals	3	-	thous. t	253	2 103
Limestone – unspecified	30	15	thous. t	1 933 740	2 293 424
High-content limestone	10	4	thous. t	3 189 433	3 353 355
Limestone-marl	8	2	thous. t	164 669	166 921
Zeolite	6	3	thous. t	108 024	113 215
Foundry sands	14	1	thous. t	277 336	508 028
Refractory clays	7	-	thous. t	3 090	5 314
Feldspars	8	-	thous. t	20 548	21 786
Total	**487**	**164**	-	–	-

Source: SGI DS

Classification of mineral deposits by state of extraction (state to the date 31st December 2010)

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.	225
2	*Deposits with fading extraction activity* include extraction mineral deposits where extraction activity will cease in a near future (within 10 years)	29
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)	27
4	*Deposits with ceased extraction* include exclusive mineral deposits with definitely or temporarily stopped extraction activity.	92
5	*Non-extracted deposits* include documented exclusive mineral deposits soon to be constructed and extracted.	43
6	*Non-extracted deposits* include documented exclusive mineral deposits with no plans for their extraction.	200
7	*Surveyed deposits* include deposits of exclusive and non-exclusive minerals with various degree of mapping.	13
Total		**629**

Source: SGI DS

Non-reserved mineral deposits (state to the date 31st December 2010)

Raw material	Number of listed deposit sites	Number of sites with extraction activities
Slate	3	-
Floatation sand	1	-
Tailing rocks	7	2
Clay	1	-
Other minerals	2	-
Sialitic raw material	6	-
Building stone	175	52
Gravel sand and sands	218	77
Brick clay	45	-
Tuff	2	-
Brucite	1	1
Total	**461**	**132**

Source: SGI DS

Other raw material deposits (state to the date 31st December 2010

Raw material	Number of listed deposit sites	Number of sites with extraction activities
Slate	3	-
Floatingsand	1	-
Tailing rocks	7	2
Clay	1	-
Other minerals	2	-
Sialitic raw material	6	-
Building stone	175	52
Gravel sand and sands	218	77
Brick clay	45	-
Tuff	2	-
Brucite	1	1
Total	**461**	**132**

Source: SGI DS

Ground water volumes

Ground waters deposits in the SR (state to the date 31st December, 2010)

Category	A	B	C	Total
Efficient deposits of the ground waters (l.s-1)	824.10	2 166.72	5 484.52	8 475.34
Efficient amounts of the ground waters (l.s-1)	-	-	15 796.47	15 796.47

Source: SGI DS

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

• SOIL

Key questions and key findings

♦ Key questions

- **What is the trend in the situation of the agricultural land types in terms of their contamination by risk elements?**
- **What is the share of the agricultural land types threatened by erosion?**

♦ Key findings

- **Based on the recent observations we can say that over the course of monitoring there was a slight increase in the contents of cadmium, copper, chrome, and lead in the agricultural land's arable soil. However, no statistically significant difference has been detected when assessing the mentioned elements. There was detected an increased content of cadmium and lead in fluvisols caused by the accumulation of these elements within the fluvial sediments and from the surrounding areas, as well as from the areas that are more distant. Content of cadmium in rendzinas was also increased, as its accumulation is facilitated by the organic matter and a neutral soil reaction at which this element is less mobile.**
- **In comparison with the beginning of land types monitoring in Slovakia (the year 1993), the recently detected values of monitored high-risk elements in agricultural land types have been statistically insignificant. This means that the soils that had already been contaminated in the past are still contaminated, so they are to be monitored in the future as well.**
- **There are approximately 40% of all agricultural land types threatened by the water erosion and about 5% of all agricultural land types threatened by the wind erosion.**

Land use

Total size of the Slovak Republic is 4 903 644 ha. In 2010, the share of agricultural land was 49.24% of total land size, while the share of forestland was 41.02%, and the share of non-agricultural and non-forest lands was 9.74%.

Land Use categories (state to the date 1st January 2011)

Land category	Area (ha)	% of total area
Agricultural land	2 414 291	49.24
Forest land	2 011 250	41.02
Water areas	94 761	1.93
Build-up land	230 589	4.70
Other land	152 753	3.11
Total area	**4 903 644**	**100.00**

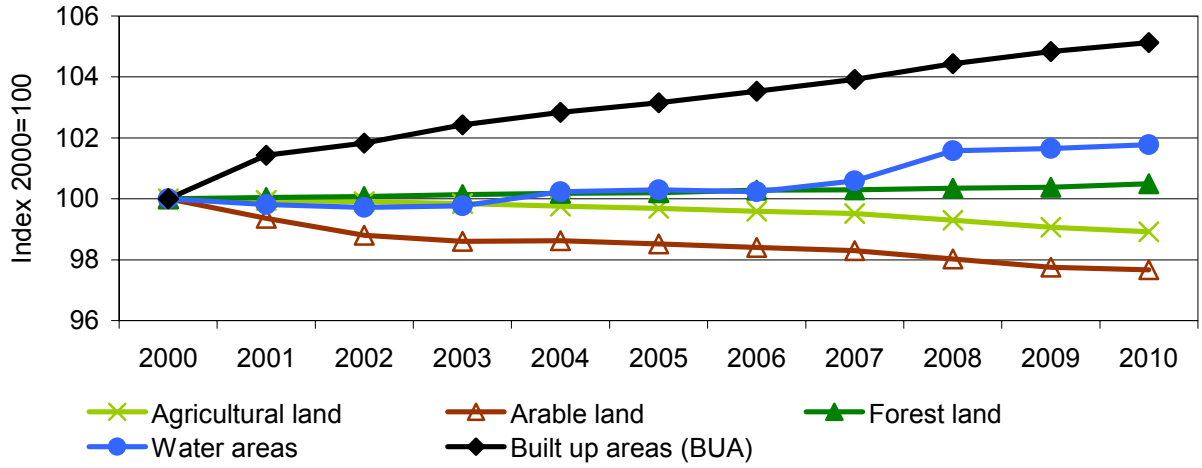
Source: GCCA SR

Anthropogenic pressure to use soil for purposes other than its primary production and environmental functions brings about its gradual decrease.

Analysis of the changes to overall values of land types for the year 2010 as compared to 2009 suggests that the loss of agricultural land in 2010 (-3 642 ha) when compared with 2009 (-5 545 ha) is smaller by 1 903 ha. Loss of arable land in 2010 (-1 350 ha) when compared with 2009 (-3 869 ha) is smaller by 2 519 ha. Increment of forestland in 2010 (2 407 ha) when compared with 2009 (586 ha) is

greater by 1 821 ha. Trend in the land types of the Slovak Republic in 2010 was marked by a continuing loss of agricultural and arable land types to forest, non-agricultural and non-forest land types, as well as by an increase in forestland at the expense of agricultural land, non-agricultural and non-forest land types.

Development of individual land types 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.

♦ Yield potential of land

Primary objective in reviewing the yield potential of agricultural land types and territory is a single-purpose synthesis of ecological and economic review of performance of agricultural production under various soil and ecological conditions. The greatest value of 100 points is assigned to loess-based Chernozem, medium-heavy and deeper than 60 cm, with favourable water regime, in warm, slightly humid climatic region found of plane surfaces. The lowest value of 6 points is assigned to a soil type on steep slopes (over 30%) under very unfavourable weather conditions and covered with grass. The mean value for land types in Slovakia corresponds to 33 points. Lands **with the highest yield potential** in Slovakia are located in the **region of Trnava** (the mean yield potential of 69.6), while **lands with the lowest yield potential** are located in the **region of Žilina** (the mean yield potential of 25.7).

Chemical degradation

Serious soil degradation includes contamination with heavy metals and organic pollutants, acidification, as well as soil salinisation and sodification.

♦ Soil contamination by hazardous substance

Outcomes of the II. PMS - S monitoring cycle with samples extracted in 1997 showed a slight improvement in the sanitary condition of agricultural land types. Apparent vertical migration of high-risk elements in the soil profile was detected. Results from the III. cycle with samples extracted in 2002 showed that the content of the majority of risk substances in selected agricultural land of Slovakia was below the limit, especially in case of arsenic, chromium, copper, nickel, and zinc. In case of cadmium and lead, excessive limit values were recorded only in soils situated in higher altitudes, podsols, andosols, which may relate to remote transfer of emissions.

Soil samples extracted in the 4th extraction cycle were processed and analysed in 2010. (2007 being the year of extraction) Chemical analyses of monitored land types for PG as well as AL categories were completed.

Present situation in the contamination of the analysed land types with extraction carried out in 2007 was first monitored pursuant to annex 2 of Act 220/2004 Coll. on the protection and use of agricultural land and on amendment to Act 245/2003 Coll. on integrated environmental pollution prevention and control and amendments to selected laws as amended, which sets forth the limit values for high-risk elements within the agricultural land. For this reason it is not possible to compare contamination with the previous monitoring cycles there were assessed pursuant to the legislation then valid.

Limit values of risk elements in the agricultural land types defined on the basis of the soil structure and value of soil reaction as well as the critical value of risk elements within the agricultural soil to plant relationship

Risk element	**Limit values for risk elements in agricultural soil** (in mg.kg^{-1} of dry matter, aqua regia decomposition, Hg total content)			**Critical values for risk elements as they relate to the agricultural soil and plant** (in mg.kg^{-1} of dry matter, in leachate of 1 mol/l amonnium nitrate, F in water leachate)
	Sandy, loam-sandy soil	Sand-loamy, loamy soil	Clay-loamy soil, clay	
Arsenic (As)	10	25	30	0.4
Cadmium (Cd)	0.4	0.7 (0.4)*	1 (0.7)*	0.1
Cobalt (Co)	15	15	20	-
Chromium (Cr)	50	70	90	-
Copper (Cu)	30	60	70	1
Mercury (Hg)	0.15	0.5	0.75	-
Nickel (Ni)	40	50 (40)*	60 (50)*	1.5
Lead (Pb)	25 (70)*	70	115 (70)**	0.1
Selenic (Se)	0.25	0.4	0.6	-
Zinc (Zn)	100	150 (100)*	200 (150)*	2
Fluorine (F)	400	550	600	5

Note: Supplied data apply to samples obtained in arable land types from the upper layer of 0.2 m and air-dried to reach constant weigh, * if pH (KCl) is less than 6, ** if pH (KCl) is less than 5,

During the process of monitoring the Slovak land types were monitored contents of high-risk elements through applying the aqua regia solution (for As, Cd, Co, Cr, Cu, Ni, Pb, Zn) while assessing determined basic statistical parameters (Xmin - minimum value, Xmax - maximum value, Xp - mean value) for the 4th extraction cycle applied to the following types of monitored soils:

1. Podsols, rankers and lithomorphic soils on acidic substrates - high-altitude mountain sites (PG) – **S1**
2. Pseudogley and pseudogley luvisols on polygenetic loess loams (AL) - **S13**

3. Pseudogley soils on polygenetic loess loams (PG) - **S14**
4. Brunisolic soils and loess-based pseudogley brunisolic soils (mostly AL)
5. Regosols on calcareous blown sands (AL) - **S21**
6. Regosols on non-calcareous blown sands (AL) - **S22**

Proportion of As, Cd, Co (in mg.kg^{-1} in aqua regia) in selected soils within the 4th extraction cycle (year of extraction - 2007)

Group of soils	Culture	Soil depth	As			Cd			Co		
			Xmin	Xmax	Xp	Xmin	Xmax	Xp	Xmin	Xmax	Xp
S1	PG	0-10	2.3	47.1	13.5	0.24	2.14	0.88	1.0	2.5	1.3
		35-45	3.1	23.9	10.9	0.05	0.51	0.23	1.0	8.1	3.2
S14	PG	0-10	6.4	18.4	10.3	0.14	1.69	0.40	1.0	16.8	7.8
		35-45	3.8	14.1	9.07	0.03	0.24	0.123	3.1	61.7	13.8
S13	AL	0-10	2.1	53.8	9.8	0.1	1.3	0.3	4.9	28.3	10.2
		35-45	1.8	49.4	9.8	0.06	3.54	0.31	5.0	27.6	11.0
S15	AL	0-10	3.1	15.5	9.2	0.14	0.5	0.24	3.6	20.8	10.0
		35-45	3.0	15.6	9.1	0.05	0.48	0.18	4.6	21.5	10.1
S21	AL	0-10	3.0	4.3	3.7	0.07	0.3	0.1	1.0	4.5	2.0
		35-45	1.8	7.7	3.9	0.009	0.123	0.072	1.8	14.2	6.5
S22	AL	0-10	1.5	4.8	2.8	0.07	0.16	0.11	1.0	2.0	3.9
		35-45	0.8	4.9	2.3	0.07	0.126	0.090	1.0	3.8	1.9

Source: SSCRI

Note: x_{min} – the minimum set value of a selected group, x_{mas} - the maximum set value of a selected group, x_2 average value of a selected group, AL - arable land, PG - permanent grassland

Proportion of Cr, Cu, Ni (in mg.kg^{-1} in aqua regia) in selected soils within the 4th extraction cycle (year of extraction - 2007)

Group of soils	Culture	Soil depth	Cr			Cu			Ni		
			Xmin	Xmax	Xp	Xmin	Xmax	Xp	Xmin	Xmax	Xp
S1	PG	0-10	2.0	35.6	14.5	3.0	39.7	10.6	1.1	9.6	5.6
		35-45	2.0	24.2	11.4	2.4	23.4	7.7	5.0	27.1	10.0
S14	PG	0-10	22.2	74.8	45.3	7.8	17.7	13.8	7.8	24.5	16.8
		35-45	23.3	61.4	41.8	4.7	19.7	14.2	1.0	33.6	19.0
S13	AL	0-10	5.5	101.1	42.1	9.5	44.7	18.0	0.2	100.0	25.3
		35-45	6.9	81.3	47.3	9.8	41.2	18.8	8.1	141.0	30.9
S15	AL	0-10	10.8	74.1	41.5	13.8	80.7	22.9	14.3	45.5	32.6
		35-45	5.0	94.9	45.9	11.0	31.4	20.1	16.9	51.2	36.3
S21	AL	0-10	18.5	50.1	29.2	9.2	58.5	22.6	10.0	20.5	15.0
		35-45	2.0	90.1	29.2	5.5	53.1	22.8	7.2	55.9	19.9
S22	AL	0-10	1.0	7.8	3.3	4.4	11.9	7.6	0.8	16.0	7.1
		35-45	2.0	11.1	5.0	2.5	10.9	5.9	1.0	7.7	16.2

Source: SSCRI

Note: x_{min} – the minimum set value of a selected group, x_{mas} - the maximum set value of a selected group, x_2 average value of a selected group, AL - arable land, PG - permanent grassland

Proportion of Pb, Zn, Hg (in mg.kg^{-1} in aqua regia) in selected soils within the 4th extraction cycle (year of extraction - 2007)

Group of soils	Culture	Soil depth	Pb			Zn			Hg		
			Xmin	Xmax	Xp	Xmin	Xmax	Xp	Xmin	Xmax	Xp
S1	PG	0-10	18.3	207.0	81.0	22.2	68.9	38.1	0.07	0.64	0.27
		35-45	5.0	30.6	14.3	20.5	54.4	40.6	0.03	0.13	0.08
S14	PG	0-10	12.0	41.9	23.8	50.9	77.6	64.7	0.036	0.176	0.075
		35-45	8.0	20.0	13.6	44.5	71.8	54.7	0.03	0.14	0.05
S13	AL	0-10	7.8	199.5	24.4	198.7	42.0	67.3	0.22	0.328	0.073

		35-45	7.1	74.8	17.8	42.2	111.0	64.4	0.02	0.13	0.049
S15	**AL**	0-10	5.5	47.4	20.2	48.6	89.6	68.8	0.0281	0.084	0.05
		35-45	5.0	30.6	16.6	42.0	98.5	68.0	0.012	0.079	0.041
S21	**AL**	0-10	5.0	17.9	9.3	35.7	62.4	45.8	0.02	0.03	0.03
		35-45	5.0	17.2	8.5	21.8	106.0	59.0	0.05	0.073	0.026
S22	**AL**	0-10	5.0	5.0	5.0	19.8	53.9	33.0	0.021	0.027	0.024
		35-45	5.0	5.0	5.0	9.3	49.4	26.2	0.011	0.024	0.017

Source: SSCRI

Note: x_{min} – the minimum set value of a selected group, x_{mas} - the maximum set value of a selected group, x_2 average value of a selected group, AL - arable land, PG - permanent grassland

Comparison of the contents of heavy metals inside the soil profile for the assessed soil categories within the IV. extraction cycle:

Arsenic	Contents of arsenic for individual categories of analysed soils of a new extraction cycle (extraction year of 2007) shows lower values in the depth of 35-45 cm than in the upper horizon.
Cadmium	Contents of cadmium for individual categories of analysed soils shows lower values in the depth of 35-45 cm than in the upper horizon.
Cobalt	Contents of cobalt for individual categories of analysed soils shows slightly higher values in the depth of 35-45 cm for all soil categories with the exception of regosol arable land on non-calcareous blown sands, which points to the vertical migration of Co in the direction of the deeper strata of the soil profile.
Chromium	Contents of chromium for individual categories of analysed soils shows that both horizons have almost identical or only slightly raised contents in the depth of 35-45 cm.
Copper	Contents of copper for individual categories of analysed soils shows that in the depth of 35-45 cm for brunisolic soil and loess-based pseudogley brunisolic soil, podsols, rankers, and lithomorphic soils on acidic substrates, and regosols on non-calcareous blown sands, the contents of copper is lower than inside the A-horizon. Within the second half of the analysed categories there has been a slight increase in the contents of copper.
Nickel	Contents of nickel for individual categories of analysed soils in the depth of 35-45 cm is slightly higher for all categories, which points to vertical migration of Ni in the direction of the deeper strata of the soil profile.
Lead	Contents of lead for individual categories of analysed soils shows significantly lower values in the depth of 35-45 cm than in the depth of 0-10 cm.
Zinc	Contents of zinc for individual categories of analysed soils shows higher values in the depth of 0-10 cm than in 35-45 cm, with the exception of the categories of podsols, rankers, and lithomorphic soils on acidic substrates, and regosols on calcareous blown sands.
Mercury	Contents of mercury for individual categories of the new extraction cycle (extraction year of 2007) shows significantly lower contents in the depth of 0-10 cm than in the depth of 35-45 cm.

Source: SSCRI

In terms of soil contamination by **organic pollutants,** notwithstanding the fact that the production of polychlorinated biphenyls (PCBs) had been stopped in the past, soil contamination remains high. However, this type of contamination is only point contamination that is often very difficult to also illustrate in space. With the exceeding limit for polycyclic aromatic hydrocarbons (PAH) we detected in the soil mainly fluoranthene (FI), benzo(a)pyrene (BaP), benzo(b)fluoranthene (BbF), and other compounds that show carcinogenic properties together with direct or late toxicity. Also exceeded values for these substances have been detected only locally and as individual points. They are typical especially for the sites of Strážske, and Žiar nad Hronom.

♦ 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.

Outcomes from the third monitoring cycle with the extraction year of 2002 showed significantly greater acidification tendencies, especially in cases of mollic fluvisols, cambisols, rendzinas, podsols, rankers, and lithomorphic soils.

The table shows the results obtained from the soil samples treated and analysed since 2010 for the IV. monitoring cycle with extraction of samples in 2007.

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

Soil representative	pH in H_2O	Al in $mg.kg^{-1}$	Al^{3+}/Ca^{2+}
		x	
Chernozems AL	7.14	-	-
Brunisolic soils AP	6.66	7.28	0.63
Pseudogley soils AL	6.45	3.43	0.33
Pseudogley soils PG	5.88	12.52	0.92
Rendzinas AL	7.97	-	-
Rendzinas PG	7.27	3.92	0.25
Regosols AL	6.90	-	-
Cambisols AL	6.24	11.81	1.99
Cambisols PG	5.48	60.65	18.33
Solonchaks and Solonetz PG	-	-	-
Podsols PG	3.77	455.57	38.73

AL – arable land, PG – permanent grassland, x – arithmetic average Source: SSCRI

In total, there has been a reduction in the mean value of the active soil reaction (compared to 1993) in four out of six assessed soil categories. These results point to an alarming trend in the development of slightly acidic and acidic soils.

The ratio of equivalent values of the exchange cations of Al^{3+}/Ca^{2+} indicates a degree of soil degradation in relation to acidification for the assessed soil categories that are used as arable lands. This value was exceeded in 35% of sites for the category of pseudogley soils and pseudogley luvisols found on polygenetic loess loams, and in 28% it was exceeded in the categories of brunisolic soil and pseudogley loess brunisolic soil, which represents an active aluminium stress for the cultivated crop.

♦ Salinisation and sodification

The process of soil monitoring assesses the contents of sodium salts and sodium ions in the soil. Their exceeded values deteriorate soil properties and thus prevent good growth of plants. **Processes of salinisation and sodification** have been monitored through a built network of stationary monitoring sites. The network includes both weak and medium solonchaks and solonetz, as well as the typical solonetz soil types. Of the total number of 8 monitored sites, 6 are situated in the Podunajská rovina (Podunajská plane). Anthropogenic soil sodification is measured in Central Slovakia by the exhausts from the aluminium production plant in Žiar nad Hronom. In the Eastern Slovakian Lowland, the monitoring network includes a typical solonetz in the cadastre area of Malé Raškovce.

The monitored area shows concurrent processes of salinisation and sodification, with sodification being more dominant.

Weak - initial to medium **salinisation,** with salt content of 0.10 - 0.35% was recorded within individual horizons of these sites: Iža, Gabčíkovo, Zemné, Komárno-Hadovce, Zlatná na Ostrove, and Malé Raškovce. High (0.36 - 0.70%) to extremely high (over 0.71%) salt content was detected at Kamenín and at Žiar nad Hronom where these salts are of anthropogenic origin.

Over the last eleven years no significant trends have been recorded in the process of salinisation.

Soil sodification as a process of binding exchangeable sodium onto the sorption complex of monitored soil in 2010 is comparable with the previous years. Its trend over the recent years (2000-2010) can be assessed by the content of exchangeable sodium percentage (ESP) and soil reaction (pH).

Content of exchangeable sodium within the sorption complex of 5-10% indicating a weak sodification was detected within the lower horizons of these sites: Zemné, Gabčíkovo, Zlatná na Ostrove, as well as throughout the whole Komárno-Hadovce site. High (10-20%) to very high (over 20%) content of exchangeable sodium was recorded in these sites: Malé Raškovce, Kamenín, and Žiar nad Hronom.

The soil reaction values (pH) as the soil sodification indicator suggest strongly alkaline reaction (pH>7.7) within the lower horizons of these sites: Iža, Zemné, as well as throughout the whole soil type of Zlatná na Ostrove, Žiar nad Hronom, Malé Raškovce, and Kamenín.

The provided data on salinisation and sodification shows that total trend in saline soils is not linear in space and time. The measured main characteristics of saline soil trend (salt content, ECe, pH, ESP) are significantly different per different soil types and horizons in time and space and there is little mutual correlation among them. This is determined both by their significant spatial variability, as well as by the type of trend itself.

Physical degradation

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

♦ Soil erosion

Potential erosion means possible threat to agricultural land types by processes of water erosion if we do not take into account the soil-protective effect of the vegetation cover. Water erosion (of different intensity) impacts 957 173 ha of agricultural land types in Slovakia.

Sizes of land categories potentially impacted by water erosion

Erosion categories	Water erosion	
	Land area in ha	% from Agricultural Land
No erosion or slightly	1 457 118	60.35
Medium	245 734	10.18
Strong	356 897	14.78
Extremely strong	354 542	14.69
Total	**2 414 291**	**100.00**

Source: SSCRI

Size of agricultural land types potentially impacted by wind erosion is 130 301 ha. These are mainly light granulated soil types with lower content of organic matter that are highly vulnerable to drying (and thus to wind erosion) especially when they are without vegetation cover.

Sizes of land categories potentially impacted by wind erosion

Erosion categories	Wind erosion	
	Land area in ha	% from Agricultural Land
No erosion or slightly	2 283 990	94.62
Medium	54 717	2.26
Strong	45 046	1.86
Extremely strong	30 538	1.26
Total	**2 414 291**	**100.00**

Source: SSCRI

♦ Soil compaction

For soil types, granulated heavy soil types show higher rate of compaction over the whole soil profile. In soil assessed for compaction the most resistant were regosols followed by sand and loamy pseudogley soil and brunisolic soil, while the least resistant were clay-loamy pseudogley soil and brunisolic soil. Of all the soil types, brunisolic soil shows the greatest rate of compaction, most likely due to its intensive exploitation.

• FLORA, FAUNA AND PROTECTED PARTS OF NATURE

Key questions and key findings

♦ Key questions

- **What is the state of protection of plant and animal species of European importance?**
- **What is the situation in the protection of habitats of European importance?**
- **What is the trend in the state of protected areas?**

♦ Key findings

- **Assessment of the situation with the protection of species of European importance suggests unfavourable state of protection. Half of the assessed vascular plants together with half of the assessed mammals, 70% of reptiles, and 90% of amphibians, show unsatisfactory or adverse situation.**
- **Assessment of the state of habitats of European importance shows unsatisfactory or adverse level of protection for 60% of forest habitats. The same situation exists for half of the shrubs habitats, 70% of grassland habitats, and also for 70% of freshwater habitats.**
- **State of protected areas has significantly improved - approximately 82% of the size of small-sized protected areas was in the optimal state in 2010, compared to 55% of these areas in 2000.**

Flora

♦ Endangerment of plant taxons

State of endangerment for individual taxons is elaborated on the basis of the *Red List of Plants and Animals of Slovakia, 2001.*

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: ŠNC SR

Level of **endangerment of non-vascular plants** in Slovakia is presently **17.6%** (including fungi). Level of **endangerment of vascular plants** is **42.6%** (for all endangerment categories), or **30.3%** (for the CR, EN, and VU categories).

Comparison of the vascular plant endangerment* in selected countries

	Slovakia	Austria	Hungary	Poland	Czech Rep.
Vascular plants (%)	30.3	33.4	19.8	11.0	42.5

Source: OECD Environmental Data Compendium, 2008

* 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 492/2006 Coll., Resolution 638/2007 Coll and Resolution 579/2008 Coll.. Number of the **state protected taxons** is now **1 418** (vascular plants – 1 285; bryophytes – 47; higher fungi – 70; lichens – 17). Also the species of European importance classified under the **Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora** not found in Slovakia are protected by pertinent legislation. Of total number of 1 418 protected taxons, **823 taxons** are found **in Slovakia** (713 of vascular plants, 23 of bryophytes, 70 of higher fungi, 17 of lichens).

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

	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 V of **Habitats Directive**	-	-	-	2*	3**
In attachment I and II of **CITES**	-	-	-	-	110
In attachment I of **Bern Convention**	-	-	-	8	35

* *Leucobryum glaucum* and the entire genus *Sphagnum*
** *Artemisia eriantha*, *Galanthus nivalis*, including the entire genus *Lycopodium*
Source: SNC SR

State of protection of plants of European importance, 2004-2006[1)] (%)

Taxons	Favourable	Inadequate	Bad	Unknown	Total
Vascular plants	10	40	10	40	100
Other plants	20	40	30	10	100

1) Assessment of 200 species registered pursuant to article 17 of the Habitat directive
Source: MoE SR

Within the implementation of **transfers, reintroductions and restitutions** of endangered species of plants, there was a transfer of seeds and 147 cruciferous leaf formations of the Rose Campion (*Lychnis coronaria*) and 2 clusters of the Roundhead bulrush (*Scirpoides holoschoenus*).

Rescue programmes (RP) were developed and implemented in 2010 for the following species of vascular plants (VP):

	VP taxons
Developed in 2010	-
Implemented in 2010	*Liparis loeselii*, *Tephroseris longifolia* ssp. *moravica*, *Carex pulicaris*, *Glaux maritima*, *Herminium monorchis*, *Spiranthes spiralis*, *Drosera anglica*, *Radiola linoides*, *Lycopodiella inundata*

Protection of the natural taxonomic composition of ecosystems through **regulation of the occurrence of non-native plant species** was carried out in 2010. Elimination of the non-native invasive and invasive-like plant species was carried out at 99 sites within the scope of 20 organisation units of the SR State Nature Conservancy. Interventions were carried out in the area of 77.03 ha and were focused primarily on 3 species: *Heracleum mantegazzianum, Solidago canadensis,* and *Fallopia japonica.*

Overview of the most spread invasive plant species as of 2010

	Name	
The most spread **invasive species**	*Fallopia japonica*	
	Fallopia sachalinensis	
	Helianthus tuberosus	
	Impatiens glandulifera	
	Impatiens parvifora	
	Solidago gigantea	
	Solidago canadensis	
	Aster novi-belgii	
	Aster lanceolatus	
	Heracleum mantegazzianum	
	Asclepias syriaca	
	Stenactis annua	
	Galinsoga parviflora	
	Bidens frondosa	
	Parthenocissus quinquefolia	
	Robinia pseudoacacia	
	Negundo aceroides	
	Ailanthus altissima	
Total	**number of known taxons of invasive sp. in the SR**	**% of total number of vascular plants taxons**
	125*	**3.7**

Data as shown in the publication **Gojdičová, E., Cvachová, A., Karasová, E., 2002: Zoznam nepôvodných, inváznych a expanzívnych cievnatých rastlín Slovenska 2.** and includes categories of invasive taxons (neophytes - 28, archaeophytes - 19) potentially (regionally) invasive taxons - 49, and expansive taxons - 29.

Fauna

♦ Endangerment of animal species

State of endangerment for individual animal species is elaborated on the basis of actual red lists (2001, 2005, 2008).

State of endangerment of the particular invertebrate taxons

Taxons	Number of taxons		Categories of endangerment (IUCN)							Endanger-ment total*	Endang. %
Group	World	SR	EX	CR	EN	VU	LR	DD	NE		
Mollusca	128 000	277	2	26	22	33	45	8	135	134	48.4
Aranea	30 000	934	16	73	90	101	97	45	-	406	43.5
Ephemers	2 000	132	-	8	17	16	-	-	-	41	31.1
Odonata	5 667	75	4	-	14	11	13	5	-	43	57.3
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	-	716	11.0
Hymenoptera	250 000	5 779	-	23	59	203	16	-	-	301	5.2
Lepidoptera	100 000	3 500	6	21	15	41	17	11	-	105	3.0
Diptera	150 000	5 975	-	5	10	71	19	93	-	198	3.3

* without the category of EX and NE

Source: SNC SR

Endangerment of invertebrates in Slovakia is now about 8.4% (or **5.4%** just within CR, EN and VU categories). For **vertebrates**, 59% of them are endangered (or **23.5%** when limited to only CR, EN and VU categories).

State of endangerment of the particular vertebrate taxons

Taxons	Number of taxons		Categories of endangerment (IUCN)							Endanger-ment total*	Endang. %
Group	World [1]	SR	EX	CR	EN	VU	LR	DD	NE		
Lampreys		4	-	-	1	1	1	-	-	3	75.0
Pisces	25 000	79	4	-	6	9	40	-	-	55	69.6
Amphibians	4 950	18	-	-	3	5	10	-	-	18	100.0
Reptiles	7 970	12	-	1	-	4	6	-	-	11	91.7
Birds[2]	9 946	219	2	7	23	19	47	4	19	100	45.7
Mammals	4 763	90	2	2	6	12	27	15	4	62	68.9

* without the category of EX and NE Source: SNC SR

[1] Source: UNEP – GBO

[2] only nesting birds – of total number of 341 birds of Slovakia, only the all 219 species of nesting birds were assessed

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

	Slovakia	Austria	Hungary	Poland	Czech Rep.
Invertebrates	5.3	-	> 0.9	-	13.1
Pisces	24.1	50.6	43.2	21.0	41.5
Amphibians	44.4	60.0	27.8	-	61.9
Reptiles	38.5	64.3	33.3	33.3	72.7
Birds	14.0	27.7	14.5	7.8	50.0
Mammals	21.7	22.0	37.8	13.5	20.0

Source: OECD

[1] "endangered" taxons include species under categories: CR, EN, and VU under IUCN
Austria) invertebrates: *insecta, decapoda, mysidacea* and *mollusca*, birds: only nesting birds
Czech Rep.) data refer to autochthonous species and EX including, birds: only nesting birds, pisces: including lampreys
Hungary) birds: all species recorded in Hungary since 1800
Poland) pisces: including lampreys.

♦ 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. 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

	Invertebrates	Pisces	Amphibians	Reptiles	Birds	Mammals
In annex II of Habitats Directive	53	23	5	1	-	24
In annex IV of **Habitats Directive**	50	1	10	9	-	46
In annex I of **Birds Directive** [1]	-	-	-	-	114	-
In annexes I and II **of CITES**	2	2	-	1	53	5
In annexes II and III of **Bern Convention**	33	38	19	12	357	65
In annexes II and III of **Bonn Convention**	-	3	-	-	209	24
In annex of **AEWA** [2]	-	-	-	-	129	-

[1] including migratory birds Source: SNC SR

[2] AEWA – African-Eurasian Migratory Water Bird Agreement

State of protection of animals of European importance[1], 2004-2006 (%)

	Favourable	Inadequate	Bad	Unknown	Total
Mammals	5	30	20	45	100
Pisces	10	10	0	80	100
Amphibians	5	70	20	5	100
Reptiles	30	60	10	0	100
Mollusca	30	10	30	30	100
Arthropoda	30	10	30	30	100
Other species	0	100	0	0	100

Assessment of 200 species registered pursuant to article 17 of the Habitat directive Source: MoE SR

♦ Care of protected and threatened animal species

Rescue programmes (RP) in 2010 were processed for the following taxons: *Bison bonasus, Castor fiber* and butterflies of *Maculinea* genus.

In **rehabilitation stations** operated by the nature and landscape protection organizations there were **adopted** in 2010 altogether **361** injured individuals or otherwise disabled animals. Back to wild nature there were **released** altogether **230** individuals and there was spent 4 840 EUR. No animals were bred (and released) in maturation facilities in 2010.

Due to the lack of funds, **guarding the nests of the bird of prey** in 2010 was carried out only occasionally, hence, also the data on the number of brought up 128 nestlings are incomplete. Expenditures associated with guarding the nests of the bird of prey were assumed partly by non-government organisations.

In term of in situ animal preservation in 2010 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 – *Spermophilus citellus, Marmota marmota latirostris, Emys orbicularis, Felis sylvestris* and *Amphibia*.

In the area of practical care of the protected animal species, the SR State Nature Conservancy ensures the **installation of foil barriers** in the problematic areas of roads at the time of spring migration of amphibians and the subsequent carrying of amphibians, mainly frogs, across the road. In total, **53 399 of amphibians were carried over** in 2010 and 20 980 m of barriers were installed, with 4 927 EUR funded.

♦ Game stock and hunting and fishing

To 31st March 2010, the **spring stock numbers** of the ungulate game 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	2008		2009		2010	
	stock	hunting	stock	hunting	stock	hunting*
Deer	44 316	16 889	46 207	18 854	51 856	19 374
Fallow deer	9 068	3 210	10 511	3 654	11 240	4 214
Roe deer	92 680	24 704	96 650	27 035	100 080	22 382
Wild boar	29 290	29 700	31 652	31 473	34 577	38 903
Brown hare	203 123	34 470	205 028	32 570	196 994	11 965
Grey partridge	13 453	462	12 562	342	10 956	419
Pheasant	190 279	135 332	200 863	115 730	186 494	88 694
Chamois	661	12	882	11	823	0
Bear	1 939	34	1 940	27	2 001	47
Wolf	1 563	121	1 698	130	1 823	149
Otter	680	0	742	0	933	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 **2 295.9 t** in 2010. The waters were **stocked** by **35 721 366 pieces of setting**.

Fishing for the economic and sport purposes in 2010 (t)

Fish species	2008		2009		2010	
	total	of this SFA*	total	of this SFA*	total	of this SFA*
Fish total Of these:	**2 734**	1 639	**2 584.2**	1 751.5	**2 295.9**	1 596.3
Carp	1 430	1 166	1 394.6	1 235.4	1 275.7	1 151.9
Trouts	833	52	698.6	58.4	608.8	55.9
Crucians	94	62	76.0	70.4	51.9	50.2
White amur	41	36	61.5	50.2	39.9	34.9
Bighead carps	10	3	14.4	4.5	11	3.1
Sheat fish	37	36	40.2	39.1	36.6	35.2
Maskalonge	55	54	51.1	50.6	52.4	51.5
Sand-eel	63	63	62.2	61.5	62.1	61.7
Grayling	7	6	5.9	5.8	3.9	3.3
Huchen	0.7	0.7	0.5	0.5	0.4	0.4
Breams	70	69	81.6	81.6	65.6	65.5
Torgoch	2	0	2.2	0.8	2	0.0
Chevins	14	14	13.9	13.9	11.6	11.6
Other fish species	78	76	81.5	78.7	74	71.1

*SFA – Slovak Fishing Association

Source: SO SR

Protected trees

The network of protected trees in 2010 was created by 459 protected trees and their groups including alleys - protected objects (in 2009 it was 462). Physically it is represented by 1 271 solitary trees of 67 taxons, including 32 domestic and 35 alien taxons (there are 3 less individual protected tree species than in the last year).

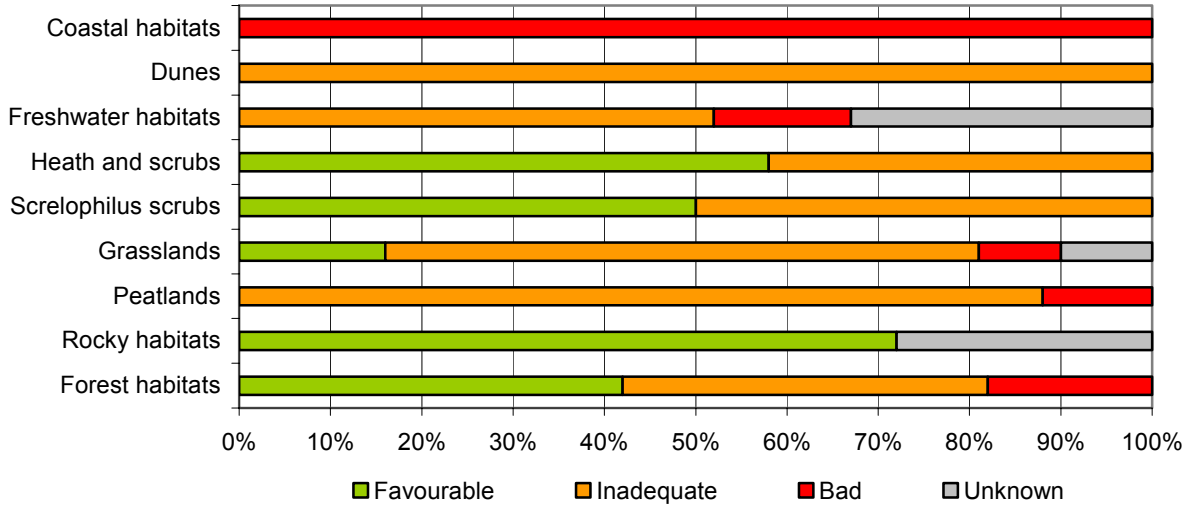
There were 295 in the **optimal** state (64.3%), 139 were **endangered** (30.3%) and 25 **degraded** (5.4%) of the protected trees and their groups. This is a slight improvement in the situation, compared to the previous year.

14 protected trees and their groups were **treated** in 2010. The funding involved the owners of individual lots where the trees grow, municipalities, non-government organisations and part of the money came from revitalisation measures applied to damaged habitats.

Habitats

Most endangered in Slovakia are saline habitats, which is the result of the decline in the level of ground water, extinction of traditional farming and secondary succession. On the other hand, best characteristics are recorded for rock habitats thanks to their inaccessibility and forest habitats thanks to a relatively sensible management of forests. The endangered habitats within the whole of Central Europe include peats and bogs, wetlands, flooded meadows, saline grassland, and sands.

Conservation of the condition of habitats of the European importance*



* data from reporting pursuant to article 17 of the Habitat directive - assessment of 66 habitats Source: MoE SR

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 **Resolution 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.

Care of the protected nature parts

♦ Implementation of the CITES in 2010

CITES scientific body of the SR, pursuant to the national and EU legislation in 2010, **commented** 39 applications filed by the SR Ministry of Environment to import of species exemplars belonging to the species listed under the CITES convention, 7 applications of the MoE SR to export such species, 49

applications of the MoE SR or local environmental offices for consultation regarding the origin of exemplars and 20 applications of the MoE SR at issuing certificates. Further, the body **produced**, upon the request of the MoE SR, local environmental offices, custom offices and police, other 48 position papers that relate to the implementation of the CITES convention. At the same time, the SR scientific body in 2010 **provided** assistance to state authorities in 69 cases of identification of species exemplars categorised in annexes of the CITES convention.

♦ Protection of caves

There are **more than 5 400 caves** registered in Slovakia. They are natural monuments at the same time. Of these, 44 most significant were classified among the national natural monuments. Protective zone was also declared for 18 caves.

Presently, there are **17 accessible caves,** 12 of them are administered by the Slovak Caves Administration, while 5 are administered by other subjects. Beside this, there are 30 caves that were declared publicly accessible caves.

In 2010, 12 proposals for declaration of freely accessible caves for the public were processed and sent to locally pertinent Regional Environmental Offices.

♦ Protected areas

8 new protected areas were **declared** in 2010 (8 PS, all being part of the Natura 2000 network) and 3 of them came into effect as late as in 2011. Also, 11 special protection areas were declared, 3 of which came into effect as late as in 2011. 2 protected areas were **updated** (1 NR and 1 NM) and 1 protective zone was declared. 1 nature monument was **cancelled**.

Comparison of protected areas in the SR in 2002 and 2010

Category	2002				2010			
	Number	Area (ha)		% of SR territory	Number	Area (ha)		% of SR territory
		core area	protective zone			core area	protective zone	
Protected landscape areas	14	525 547	-	10,7	14	522 582	-	10,66
National parks	9	317 821	238 124	12,1	9	317 890	270 128	11,99
Large-size protected areas	**23**	**843 368**	**238 124**	**22,8**	**23**	**840 471**	**270 128**	**22,65**
Protected sites	189	7 001	2 263	0,19	172	5 534	2 419	0,16
Nature reserves	376	11 767	243	0,25	388	13 175	247	0,27
National nature reserves	231	85 905	3 383	1,82	219	84 130	2 239	1,76
Nature monuments	230	1 531	208	0,04	254	1 585	496	0,05
National nature monuments	60	59	27	0,002	60	59	2 352	0,05
Protected landscape fragment	-	-	-	-	1	3	-	0,00
Small-size protected areas	**1 086**	**106 263**	**6 124**	**2,3**	**1 094**	**104 486**	**7 752**	**2,29**

Source: SNC SR

In total, **in the territory of PLA** there are **245 small-size** protected areas (SSPA) (this represents 2.3% **of total PLA territory**), **in the territory of NP** there are **206** SSPA (**22.5%** of the NP area), while **in the territory of NP protective zones** (PZ) there are **66** SSPA (**0.9%** of the NP protective zones area). **Outside PLA, NP, and NP PZ**, which means **the open landscape**, there are **577** small-size protection areas (0.7% of the open landscape area).

Overview of protected areas in the SR by types and levels of protection (as of 31.12.2010)

Level of protection*	Category	Area (ha)	% of SR territory
1th level	„ open landscape “	3 767 274	76.83
2th level	PLA**, NP PZ**, D zones	759 267	15.48
3th level	NP**, PS, PS PZ, NR PZ, NNR PZ, NM PZ, NNM PZ, C zones	265 686	5.42
4th level	NNR, NR, NNM, NM, PS, NR PZ, NNR PZ, NM PZ, NNM PZ, B zones	18 045	0.37
5th level	NNR, NR, NNM, NM, A zones	93 129	1.90
2-5th level	special protected nature parts in the SR	**1 136 126**	**23.17**

Source: SNC SR

* excluding territories without the level of protection (SPAs and PZs of caves and natural waterfalls)
** area without SSPA

Endangerment and degradation of the protected areas

Of the total number of 1 094 small-size protected areas, there were **degraded** 24 territories of area of 283 ha (this area presents 0.3% of total area of SSPA), 435 were **endangered** of area of 20 303 ha (18.1% of SSPA) and in the **optimal condition** there were 635 territories of area of 91 652 ha (81.6% of SSPA).

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 174.7 thous. EUR. A number of measures were implemented at the same time within individual areas; just like in the previous years, the activities involved mainly cutting of volunteer trees and mowing, including the removal of the biomass from the area. Beside these activities, the other activities included mulching, grazing, fence building and fence repairs, elimination of invasive species, collection and disposal of waste, etc. Part of these regulatory interventions has been funded from the state budget, while another part came from donors. 14 protected tree types and their groups were treated.

During the year 2010 State Nature Conservancy of the SR elaborated 7 674 **expert viewpoints**. The biggest rate was created by the department of tree species protection and building and regional planning activities. Beside these, 745 so-called **declarations** (declarations by the body responsible for monitoring of the NATURA 2000 territories) were processed by all organisational units of the SR State Nature Conservancy on the basis of applications from the state government bodies, local governments or investors. These declarations concerned the projects applying for the EU funding, mostly from the operational programmes of environment, transboundary cooperation, and transport.

Professional nature protection organisations in 2010, due to the lack funding, did not carry out any **inventory surveys** within the small-size protected areas, or they were performed only occasionally as parts of other activities.

In 2010, 37 **education paths** or **education localities** were repaired or reconstructed. **13 information centres of nature protection** and the **Nature Protection School** in Varín were administered.

Protected areas within the international context

European Diploma of Protected Areas

So far, there have been 2 protected areas that received the European Diploma:

- NNR Dobročský prales (A category) and
- NP Poloniny (B category).

Man and the Biosphere* Programme *(MaB):

The following 4 protected areas have been included into the biosphere reserves in Slovakia:

- PLA - Poľana biosphere reserve
- NP - Slovak karst biosphere reserve
- NP - East Carpathian biosphere reserve (trilateral BR)
- Tatra NP - Tatra biosphere reserve (bilateral BR).

As of 2010, **14** wetlands were declared and registred in *List* of *Wetlands* of International Importance as **Ramsar sites** with total size of **40 697 ha** under the *Convention on Wetlands of International Importance Especially as Waterfowl Habitat* (**Ramsar Convention**):

Name of wetland	Area (ha)	District	Date of registration
1. Parížske swamps	184.0	Nové Zámky	2.7.1990
2. Šúr	1 136.6	Pezinok	2.7.1990
3. NNR Senné - ponds	424.6	Michalovce	2.7.1990
4. Donau floodplains	14 488.0	Bratislava II, V, Senec, D. Streda, Komárno	26.5.1993
5. Flat of Morava river	5 380.0	Bratislava IV, Malacky, Senica, Skalica	26.5.1993
6. Latorica river	4 404.7	Michalovce, Trebišov	26.5.1993
7. Alluvium of Rudava river	560.0	Malacky, Senica	17.2.1998
8. Wetlands of Turiec	750.0	Martin, Turčianske Teplice	17.2.1998
9. Poiplie	410.9	Levice, Veľký Krtíš	17.2.1998
10. Wetlands of Orava basin	9 287.0	Námestovo, Tvrdošín	17.2.1998
11. Orava river and its confluents	865.0	Dolný Kubín, Tvrdošín	17.2.1998
12. Domica cave	621.8	Rožňava	2.2.2001
13. Tisa river	734.6	Trebišov	4.12.2004
14. Caves of Demänovská valley	1 448.0	Liptovský Mikuláš	17.11.2006

Review of Biosphere Reserves and Ramsar sites in selected countries

		Slovakia	Czech Rep.	Poland	Hungary	Austria
Biosphere Reserves (BR)	Number	4	6	9	5	6
Ramsar wetlands	Number	14	12	13	28	19
	area (km^2)	407.0	546.8	1 450.8	2 354.1	2 524.0

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

Source: SNC SR

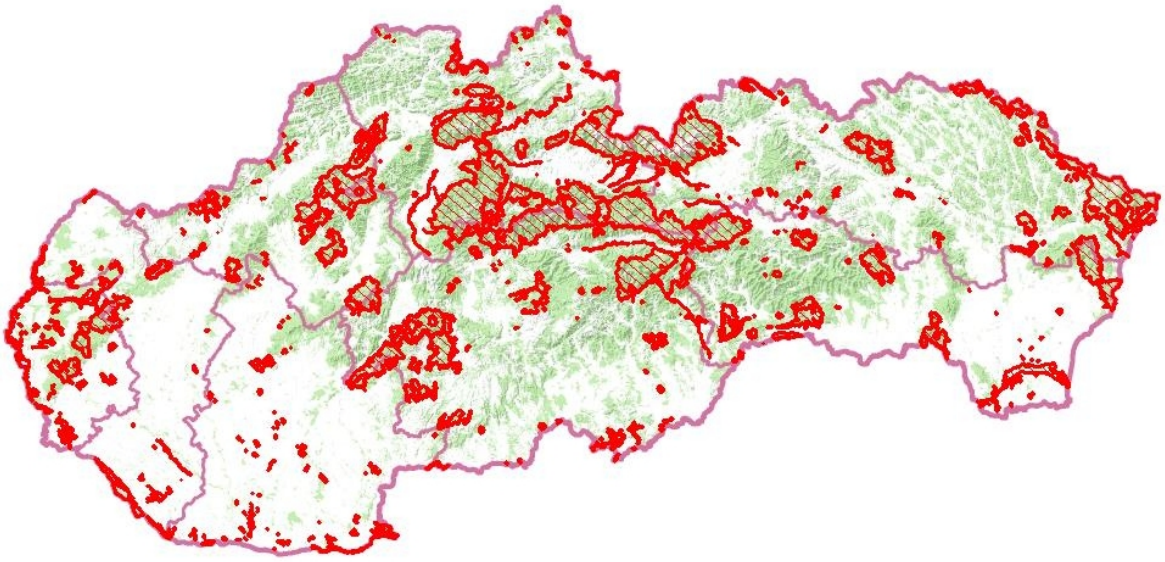
NATURA 2000 in Slovakia

The NATURA 2000 network (pursuant to sect. 28 of the Act No. 543/2002 Coll. on nature and landscape protection uses the following wording: *"Coherent European Network of Protected Areas"* comprises two types of areas:

Sites of Community Importance (SCI)

- national list of SCI was approved on 17.3.2004 by the Slovak Republic government and published *on the basis of the MoE SR Edict* of July 14, 2004 and was sent to the European Commission for approval;
- SCI are proposed for **44 plant taxons**, **96 animal species** and **66 types of biotopes**;
- Into the **proposed list** of the SCI there were originally 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;
- these territories are presently under the so-called **preliminary protection**, which means the proposed protection level;
- since 2008, or since the publication of decisions of the European Commission (EC) which adopted lists of the Sites of Community Importance in the Pannonian and Alpine bio-geographical regions, Slovakia has been in the **6-year time limit of SCI declaration** for protected areas under the national classification of protected areas, specifically in the category of nature reserve and protected site;
- on the basis of the outcomes of **bio-geographical seminars**, European Commission requires that the SCI national list be **completed**. State Nature Conservancy of the Slovak Republic elaborated a scientific draft for adding 267 areas into the SCI national list and at the same time proposed to eliminate from the original list 5 areas that are considered scientific fallacy;
- of the present **381 areas** located in Slovakia, 204 fully overlap with the existing system of protected areas. Of the remaining 177 SCI, 74 are located outside the existing system of protected areas and 103 areas partly overlap with the system. These areas need to be **declared as protected areas by May 1, 2012**.

Sites of Community Importance in the SR

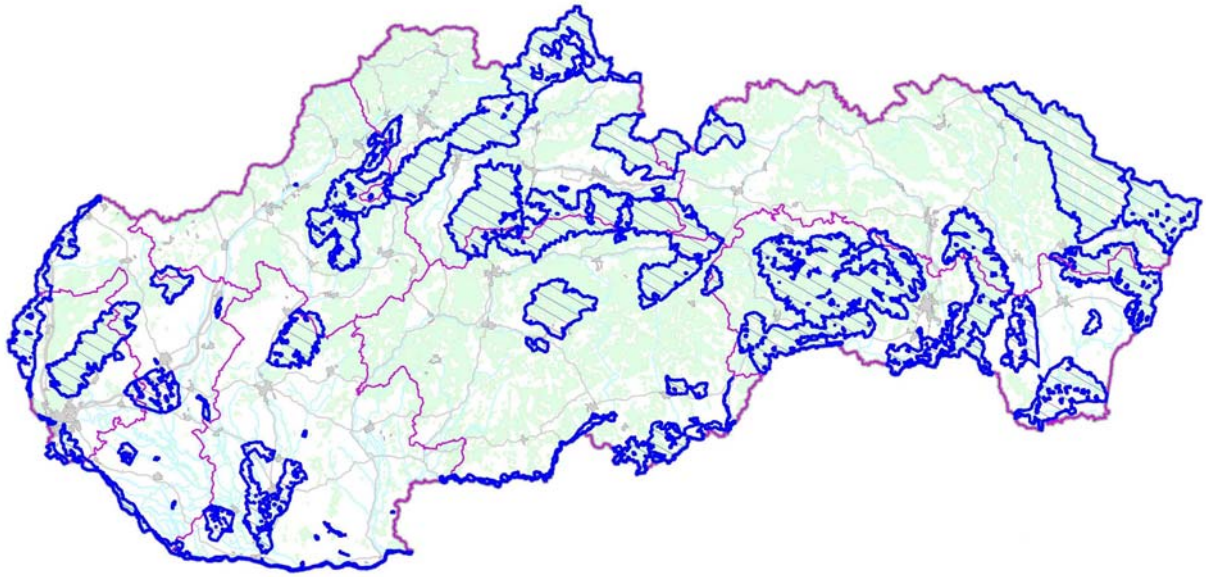


Source: SNC SR

Special protection areas (SPA)

- 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 SPA. National list includes **38 SPA** with total area of **1 154 111 ha** and covers **23.5% of the SR area** and lapping of SPA with the existing network of protected areas in the SR presents **55%**;
- Slovak Government Resolution 345/2010 of 25/05/2010 **revised and amended** the national list. **5 new** areas were added to the list and **2** areas were **taken out.** At present, the national list contains **41 areas** with total size of **1 287 296 ha**;
- ongoing monitoring of birds within individual SPAs was focused on analysing the species composition as well as their number in particular SPA;
- as of 2010, 35 SPAs were declared (of the total number of 41) with the size of 1 032 930 ha.

Special protection areas in the SR



Source: SNC SR

Agricultural and forest land 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**	1 287 296	365 102	28.4	802 204	62.3
SCI	**381**	573 690	54 657	9.5	497 295	86.7

Source: SNC SR

Comparison of the SCI and SPA areas in Slovakia with selected countries of EU (as of May, 2010)

Country	SPA			SCI		
	number	area (km²)	% of country area	number	area (km²)	% of country area
Austria	96	9 869	11.8	168	8 978	10.7
Czech rep.	39	9 684	12.3	1 082	7 854	10.0
Hungary	55	13 512	14.5	467	13 973	15.0
Poland	141	55 228	15.6	823	38 003	11.0
Slovakia	38	12 236	25.1	382	5 739	11.7
EU-25*	**5 315**	**593 486**	**11.4**	**22 529**	**719 015**	**13.7**

* only terrestrial NATURA 2000 sites

Source: EC (NATURA 2000 Barometer)

URBAN AND RURAL ENVIRONMENT

• SPATIAL DISTRIBUTION AND FUNCTIONAL USE OF TERRITORY

Key questions and key findings

♦ **Key questions**

- **What are the trends in demographic development and urbanisation?**
- **What is the trend in the structure of lots and surfaces in Slovakia?**

♦ **Key findings**

- **Although there was still recorded a total population increment, in 2010 the growing trend in natural increment of population from the recent years stopped. The increasing life expectancy is perceived as a positive sign. In terms of the degree of urbanisation, proportion of urban population in Slovakia dropped from 56.9% in 2000 to the present 54.7%.**
- **Within the process of surface structure development in Slovakia, there is a natural shift in soil types between agricultural land types and forest land, with the year 2010 being impacted by further loss of agricultural and arable land types and increasing forest land.**

Settlement and demographic trend

As of **December 31, 2010,** there were **5 435 273 inhabitants** in Slovakia. Trend in increasing the natural population increment stopped and reached the value of 6 965 which was by 1 339 persons less than in 2009. Slovakia gained 3 383 persons through international migration, which are 984 persons less than in the previous year. **Total increment** in population reached **10 348 persons**, which are 2 323 less than in 2009. The most positive element in the demographic trend has been the ongoing growth in life expectancy.

Basic data about the migration of population in the SR (to 31st December 2010)

Territory	Live births	Dead	Natural increment (loss)	Migration increment (loss)	Total increment (loss)	Number of inhabitants
Bratislavský region	7 567	5 957	1 610	4 370	5 980	628 686
Trnavský region	5 574	5 608	-34	1 590	1 556	563 081
Trenčiansky region	5 940	5 833	107	-502	-395	598 819
Nitriansky region	6 539	7 840	-1 301	392	-909	704 752
Žilinský region	7 619	6 585	1 034	-262	772	698 274
Banskobystrický region	6 729	7 206	-477	-491	-968	652 218
Prešovský region	10 567	6 894	3 673	-1 241	2 432	809 443
Košický region	9 875	7 522	2 353	-473	1 880	780 000
Slovak Republic	**60 410**	**53 445**	**6 965**	**3 383**	**10 348**	**5 435 273**

Source: ŠO SR

Structure of the settlement in the SR (to 31st December 2010)

Territory	Area (km^2)	Number of inhabitants per km^2	Number of independent municipalities	Average number of inhabitants per municipalities	Urbanization level (%)	
					Urban area	Rural area
Bratislavský region	2 053	306.30	73	8 612	81.71	18.29
Trnavský region	4 147	135.79	251	2 243	48.13	51.87
Trenčiansky region	4 502	133.01	276	2 170	56.41	43.59
Nitriansky region	6 344	111.09	354	1 991	46.47	53.53
Žilinský region	6 809	102.56	315	2 217	49.90	50.10
Banskobystrický region	9 454	68.99	516	1 264	53.21	46.79
Prešovský region	8 974	90.20	666	1 215	48.76	51.24
Košický region	6 754	115.48	440	1 773	55.39	44.61
Slovak Republic	**49 036**	**110.84**	**2 891**	**1 880**	**54.68**	**45.32**

Source: SO SR

Index trend in the SR area structure

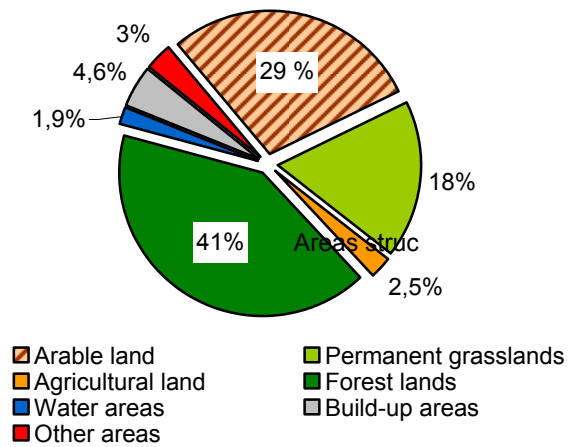
Trend in the land types of the SR in 2010 was marked by a continuing, though less significant, **loss of agricultural and arable land types** to forest, non-agricultural and non-forest land types, as well as by an increase in forestland at the expense of agricultural land, non-agricultural, and non-forest land types. Loss of agricultural land in 2010 (-3 642 ha) when compared with 2009 (-5 545 ha) is smaller by 1 903 ha. Loss of arable land in 2010 (-1 350 ha) when compared with 2009 (-3 869 ha) is smaller by 2 519 ha. Increment of forestland in 2010 (2 407 ha) when compared with 2009 (586 ha) is greater by 1 821 ha.

Overall land categories to 31st December 2010 (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	73 179	-	4 476	4 561	932	9 385	92 533	75 041	5 755	16 240	15 686	**205 255**
TT	260 211	129	4 206	8 270	2 432	14 794	290 042	65 231	15 765	28 007	15 617	**414 662**
TN	97 633	354	83	8 073	2 548	756 955	184 647	221 345	6 379	23 671	14 157	**450 199**
NR	406 076	36	12 055	14 163	4 896	30 366	467 592	96 390	15 744	38 103	16 550	**634 380**
ZA	60 991	-	-	6 065	399	178 211	245 666	380 088	12 816	25 477	16 820	**680 867**
BB	165 677	-	3 333	11 047	1 848	233 347	415 251	463 889	7 950	33 410	24 943	**945 444**
PR	149 004	-	23	10 835	1 952	220 274	382 089	441 853	14 060	31 668	27 719	**897 390**
KE	203 861	-	2 915	13 515	2 027	114 152	336 471	267 412	16 291	34 012	21 260	**675 447**
Spolu	**1 416 633**	**520**	**27 091**	**76 529**	**17 034**	**876 484**	**2 414 291**	**2 011 250**	**94 761**	**230 589**	**152 753**	**4 903 644**

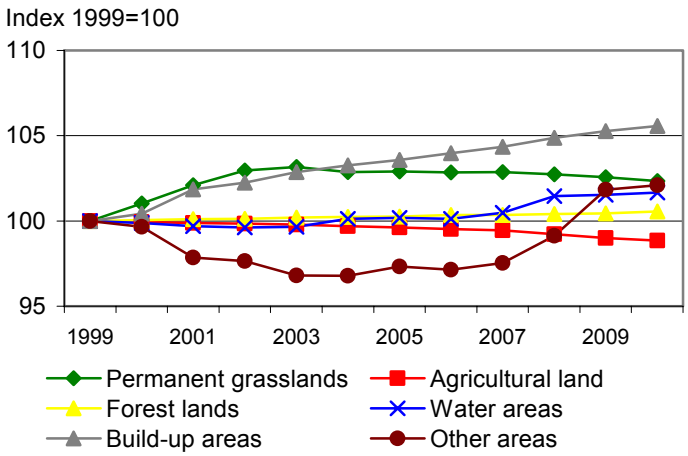
Source: IGCC SR

Areas structure in the SR (2010)



Source: IGCC SR

Index trend in areas structure of SR



Source: IGCC SR

Spatial planning

The process of updating the **Regional Development Strategy of Slovakia 2001** (KURS 2001) pursuant to Act 50/1976 Coll. on physical planning and construction code (the Building Act) as amended was terminated in 2010. In the meantime, its draft was considered as a strategic document with possible trans-boundary impact pursuant to Act 24/2006 Coll. on environmental impact assessment and on amendment to selected laws.

All local governments at **the regional level** validated their physical plans that are updated on an ongoing basis, in accordance with the provisions of the Building Act.

Municipal government is the pertinent authority for physical planning and creation of physical plans of the city, village, and zone at the **municipal level.** Every year, over the period of 2006 to 2010, the national government released funds to municipalities in order to create physical planning documentations. Following are the municipalities that receive **the subsidy**:

- 2006 total 1 mil. SKK (7 municipalities)
- 2007 total 1.9 mil. SKK (16 municipalities)
- 2008 total 7 mil. SKK (32 municipalities)
- 2009 total 7 mil. SKK (36 municipalities)
- 2010 total 170 000 EUR (24 municipalities).

• RURAL ENVIRONMENT

Key questions and key findings

♦ **Key questions**

- **How has the care for the rural environment been ensured?**

♦ **Key findings**

- **Of all residential units in Slovakia, 95.2% are villages, with 45.3% of inhabitants living in the country. In 2010, 13th cycle of the Village Renewal Programme was implemented. Subsidies were given as part of the Programme at the sum of 659 528 Euro (39% of subsidies asked for) to 182 subjects. The village of Dobrá Niva, winner of the Village of the Year national competition in 2009, represented Slovakia at The European Village Renewal Award competition in 2010.**

Care of the rural environment

Four fifths of the EU territory is characterised as rural landscape typical for food production and its role as the regional culture creating agent. Rural environment represents ecological and historical-cultural qualities of the environment.

The existing natural conditions predispose Slovakia to having a part of its population connected to the rural environment. Of 2 891 residential units, 2 753 are villages, i.e. 95.2%, and 138 are cities and towns, i.e. 4.8%. Proportion in the number of urban to rural inhabitants is 54.7% to 45.3%, while developed countries show this proportion as high as 80% to 20%. Based on the EUROSTAT data and the OECD statistics, Slovakia is characterised as a rural country.

The idea of village renewal finds its significant place within the whole framework of rural awareness. The ideas behind the village renewal initiative are connected with a better future of the rural area on the basis of activating its inner strengths. Global goal of the **Village Renewal Programme** is to keep the man in the village.

♦ Village Renewal Programme

Village Renewal Program (VRP), over thirteen 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.

The programme is based on the process of POD awareness raising and promotion in the area of renewal of tangible, natural, and spiritual environment as it relates to programming and planning

processes, and on monitoring the interest of villages, as well as on positive examples of implementation with the aim of their further spreading through the Village Renewal School approach. SEA makes sure the mentioned activities are part of its legal scope of work, pursuant to the Slovak government Resolution 222/1997. The Agency, through its advisers and VRP office keeps track of the applications from villages and rural micro-regions, it also organises a national competition called the **Village of the Year**, and officially represents the ministry in international structures.

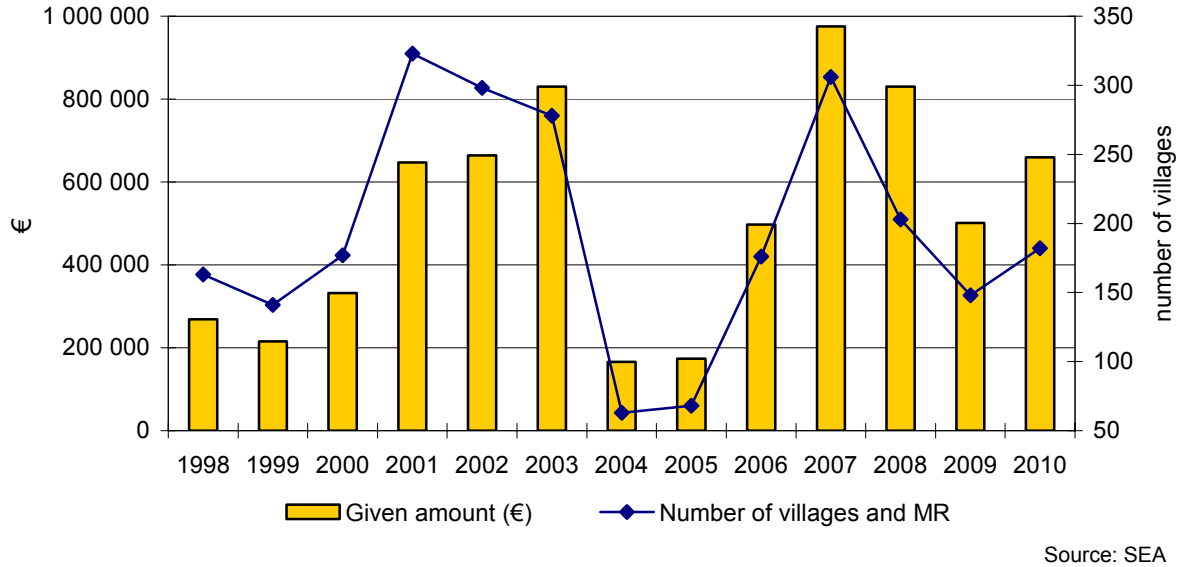
Beside the indirect support, the Programme also provides for financial form of government support - this is a system of small subsidies, typically several thousand EUR per municipality. In 2010, the **VRP support** reached total volume of **659 528 EUR**. Subsidy categories were adjusted to take into consideration the preferences of the SR Ministry of Environment.

Total overview of allocating the subsidies to VRP in 2010 (EUR)

C8/ studies, project documentations and SD programmes *		C9/ small realizations		C10/ edification and advertising		Combined criteria		Total all subsidy categories	
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 (€)	Number of villages and MR	Given amount (€)
46	160 532	71	251 235	13	52 100	52	195 661	**182**	**659 528**

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

Trend of allocating the subsidies to VRP



Source: SEA

Total **average subsidy per 1 applicant** was **3 624 Euro,** while % of **approved** applications reached the value of **33.6%**.

♦ The Village of the Year competition

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, in 2006 it was the village of Vlachovo from the district of Rožňava that had won the competition in 2005, in 2008 it was the village of Liptovská Teplička from the district of Poprad that had won the competition in 2007 and in 2010 it was the village of Dobrá Niva from the district of Zvolen, winner the competition in 2009.

The Village of the Year competition is announced and organised in Slovakia by the SEA in cooperation with the Village Renewal Association and the Association of Towns and Communities of Slovakia, supervised by the Slovak Ministry of Environment.

In 2010, the village of Dobrá Niva represented Slovakia at the 11th European Village Renewal Award competition. The competition was titled: "New energy for strong neighbour relationships". Of 30 contesting municipalities from 11 European countries, the winning municipality became Langenegg from Vorarlberg. The village of Dobrá Niva made a very good impression and left with the "European Village Renewal Prize for exceptional performance in a number of village renewal areas". The village of Oravská Lesná belongs to the top candidates for 2011.

• URBAN ENVIRONMENT

Key questions and key findings

♦ **Key questions**

- **How has the care for the urban environment been ensured?**

♦ **Key findings**

- **Trend in the urbanisation of the Slovak Republic is slower than in the other European countries, with the share of urban population representing 54.7%. In 2009, a methodology for the urban landscape of the Environmental Action Plan was developed, based on the 6th EAP - Thematic strategy for the urban environment. Within the UN Habitat Agenda, the Slovak Government created a National Action Plan for the development of settlements and housing in Slovakia. The plan is being updated regularly, every 2 years. Size of green areas in towns and villages in 2009 reached 11 570 ha in 2009 (6.1% more than in 2007), when calculated per capita, the size of green areas over a long time period has been around 21 m^2.**

Care of the urban environment

Global trend suggests that the 21st century is the **era of the cities**. 80% of all EU citizens live in urban area, which means that four out of every five EU citizens live primarily in the cities. Every year, 60 million people become new inhabitants of the European cities. Almost six billion people will have been living in urban areas by 2050.

In Slovakia, the dominant type of population is urban - **54.7%**. Trend in the **urbanisation** measured by the proportion of urban population to total population is slower when compared to developed European countries.

♦ Thematic strategy on the urban environment

In 2004, the European Commission approved a Note by the EC to the Council and the European Parliament on **Thematic strategy on the urban environment** (COM(2005)0718). **Objective** of the strategy is to contribute toward improvement in the quality of the urban environment in all activities of man.

Important measure included within this thematic strategy is a recommendation to municipalities to address the issue of urban environment at the level of local governments through so-called **environmental urban planning (EUP)**. The European Commission **recommends** implementing this strategy to all levels, including the national, through regional, and down to local authorities' level, which is to lead to the improved environment in cities.

♦ Environmental Urban Action Plan

In 2009, a **methodology** for the ***Environmental Urban Action Plan*** was developed by the SEA, based on the 6th EAP - Thematic strategy for the urban environment.

The present need for solution to environmental issues gave rise to the idea of creating a **professional forum** able to address this complex issue. On October 28, 2010, the Slovak Environmental Agency organised in the city of Žilina the 3rd annual **Conference on urban environment** with international participation. Its central topic was *The quality of urban environment.*

♦ UN Habitat

Another international initiative in the area of promoting the quality of urban living is the UN programme for human settlements - **UN Habitat,** with the mandate by the General Assembly to support the social and environment sustainable urban development with the goal to create an adequate shelter for all.

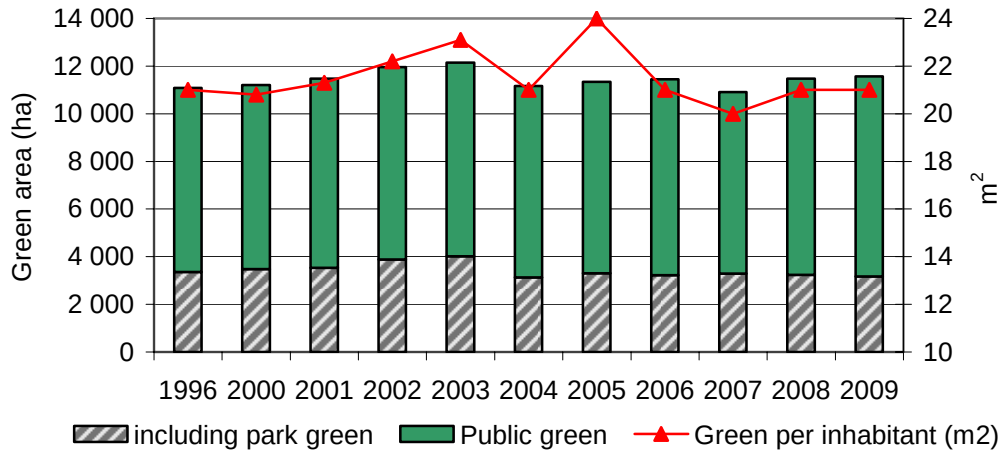
The Slovak Government, based on its binding accession to the Habitat Agenda, created the ***National Action Plan for the Development of Settlements and Housing in the Slovak Republic***. The Ministry of Environment by its decision initiated the creation of the **National Habitat Committee in the SR** as a permanent advisory body for the monitoring and coordination of the Habitat Agenda implementation in Slovakia. ***National Action Plan for the Development of Settlements and Housing in Slovakia*** is being periodically updated on the basis of resolutions adopted at the meetings of the Executive Board for the Habitat Programme, which take place regularly, every odd year.

Green in residential areas

Green in residential areas is considered the most effective, spatial, protective, healing, and decorative element. Basic functions of municipal green sites include the **hygienic-health** function (*decreasing the temperature, creating shades through tree foliages, increasing their humidity, decreasing the wind speed, filtration impacts of the greenery, reduction in noise level in the urban environment)*. Greenery plays also other important functions, among them for example **psychological, aesthetic, recreational** and other.

As of **2009**, size of green areas in towns and villages in Slovakia was **11 570 ha,** which is 99 ha more than in 2008. Of this, park greenery was 27.4%. Share of public green per one inhabitant was **21 m^2**.

Trend of public green in the SR



Source: SO SR

• VALUE DIFFERENTIATION, LANDSCAPE PROTECTION AND CREATION

Key questions and key findings

♦ **Key questions**

- **How is the landscape protection and creation and its values ensured?**

♦ **Key findings**

- **In 2010, the Slovak Ministry of Environment approved the Methodology for the Identification and Assessment of Landscape Characteristics. For the first time ever, the Slovak Ministry of Environment awarded the National SR Landscape Award at the national competition organized as part of Slovakia's participation in the 2nd year of the Council of Europe Landscape Award under the European Landscape Convention, which was given to the Ekopolis foundation.**
- **There has been observed a long-term increase in the number of national monuments (by 16.9% compared to 2000) with a dominant share of architectural monuments. Slight increase is also recorded for the number of movable cultural monuments, 98% of which are of religious character. Share of the state as the owner of these monuments gradually declined from 36% in 1989 to 15% in 2000, and to 9.7% in 2010. Construction and technical state of these monuments have partly been stabilised thanks to grant schemes, with almost 70% of all monuments being in satisfactory conditions in 2010.**
- **Slovakia has been taking part on the protection of the world heritage under the Convention concerning the protection of the world culture and natural heritage assisted by UNESCO, with seven sites in Slovakia being added to the World Heritage List in 2010.**
- **As of 2010, there were 3 managed territories of national geoparks: the geoparks of Banská Bystrica, Banská Štiavnica, and Novohradský, the last of these becoming the 37th member of the European Geoparks Network, and the 66th member of the Global Geoparks Network assisted by UNESCO.**

Value differentiation of landscape and landscape diversity

Pursuant to the European Landscape Convention (ELC), **preservation of diversity of the European countries** as values of the common natural heritage has been a significant need for the whole of Europe.

In order to define the value of our country within the European context, it is necessary to identify the unique, specific traits of the landscape determined by the natural and cultural-historical characteristics, and consequently attribute exceptional status and significance to them through the evaluation criteria (national, European, World).

In terms of methodology of assessment of Slovakia, approval of the **Methodology of identification and assessment of the landscape characteristics** is becoming an important landmark. The methodology was elaborated at the SEA in cooperation with the Faculty of Ecology and Environmental Science of the Zvolen Technical University, and the Slovak Ministry of Environment *(Jančura, P., Bohálová, I., Slámová, M., Mišíková, P., 2010)*. After being subject to professional scrutiny and internal discussions, the Methodology was approved at an operative meeting of the

Slovak Ministry of Environment in February 2010, and officially published in July 2010 in the Bulletin of the Slovak Ministry of Environment.

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**. 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**.

Support for the ELC implementation in 2010 was obtained through the creation of suitable conditions for institutional support of the convention, securing its continuous promotion, education and training in the area of landscape protection, winning a support through the national and international cooperation, and carrying out applied research in the area of landscape assessment and monitoring.

Pursuant to article 11 of the ELC, the Council of Europe Landscape Award has been awarded for selected party/ies. Slovakia has been participating in the 2nd year of the Award scheme through organising a national competition. **It was in 2010** when the Slovak Ministry of Environment awarded its first **Award of the Slovak Republic for Landscape.** The Award was given to the **Ekopolis foundation** for their Project of sustainable care of landscape through the Foundation's grant schemes. Specialised 2010 national landscape award Commission gave special recognition certificates to other two nominated projects.

The winning project was consequently nominated by the national coordinator for the **2011 Council of Europe Landscape Award.** As part of the ELC support and exchange of information within the process of landscape protection and care, there were two major conferences organised in Slovakia in 2010. The 14th annual international conference of "Landscape - Man - Culture" was organised in May of 2010, addressing the topics relating to the 10th anniversary of the ELC, International Year of Biodiversity, and the declaration of the first annual Slovakia Landscape Award. The conference called EKOPOLIS "Landscape in Town, Town in Landscape" was organised in October with the following slogan: European Landscape Convention as a new challenge for urban and peri-urban landscape. 127 people from ten countries attended the Conference.

Framework Convention on the Protection and Sustainable Development of the Carpathians

Framework Convention on the Protection and Sustainable Use of the Carpathians signed by the ministers of environment of the countries of Czech Republic, Hungary, Poland, Romania, Serbia, Montenegro, Slovakia, and Ukraine became effective in 2006.

The Convention **supports** a complex approach and cooperation in the area of sustainable use of the Carpathians. Its **objective** is to protect and restore the unique, rare and typical natural complexes and objects of recreational and other importance, located in the heart of Europe.

Slovak Republic, under the supervision of the Slovak Ministry of Environment, was required to prepare and implement in 2011 the III. Conference of the signatories to the Carpathian Convention, COP 3.

Monument fund

In 2010, there was again a slight increase in total number of movable (and immovable) cultural monuments, compared to 2009.

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

Categorization of immovable NCM*	2005	2006	2007	2008	2009	2010
Architectural monuments	7 738	7 799	7 802	8 069	8 092	8 408
Archaeological monuments	360	368	369	376	393	407
Historical monuments	1 386	1 382	1380	1394	1 401	1 399
Historical gardens and parks	340	341	344	344	373	382
Folk architecture monuments	1 833	1 823	1 821	1 902	2 055	2 099
Technical monuments	454	484	496	500	526	520
Art work monuments	1 005	1 015	1 007	1 367	1 506	1603
Total	**13 116**	**13 212**	**13 228**	**13 952**	**14 346**	**14 818**

Source: MB SR

* Presented is the number of monument buildings, which comprise the immovable NCM.

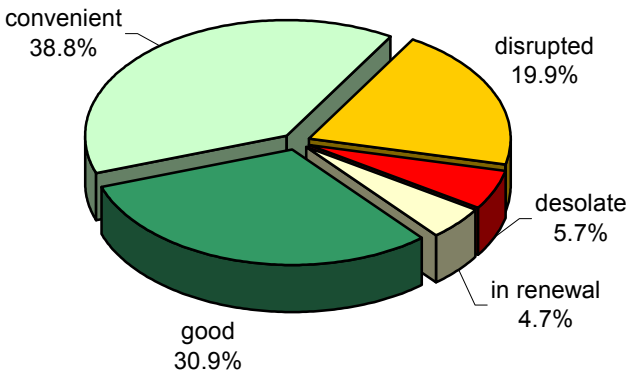
To 31st December 2010, there were 9 681 **immovable national cultural monuments** in Slovakia consisting of **14 818 monument buildings** and **14 654 movable national cultural monuments** (98% of it has sacral character), which consist of **32 492** cultural articles.

Literary sources point to the past existence of 300 **castles** in Slovakia. Presently, the 9 681 immovable national culture monuments include 112 **castles** and 437 **mansions**. **Monument objects** within the NCM in 2010 register:

- 566 mansions and family households
- 112 castles
- 79 monasteries
- 1581 churches
- 1 251 people's government houses
- 2 379 manor houses
- 226 palaces and villas
- 673 road sculptures and crosses
- 504 commemorative wall tablets and commemorative sites
- 31 cemeteries and individual graves

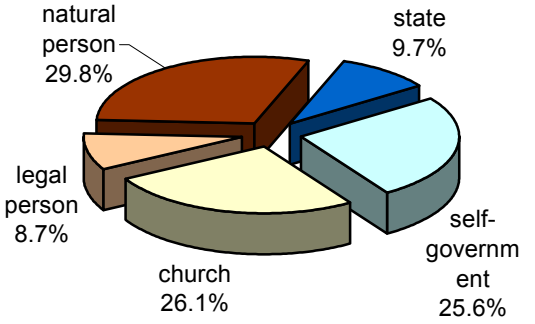
As of 2010, there were 51 **unused** cultural monuments in Slovakia (according to the MB SR catalogue).

Construction and technical state of immovable NCM in 2010 *(expressed in % of monument objects comprising the NCM)*



Source: MB SR

Ownership form of immovable NCM in 2010



Source: MB SR

Construction and technical state of monuments has been partly stabilised, thanks to grant programmes. State of the majority of monuments moved under the category of satisfactory, from 33% to almost 39%. **When added to the monuments in good state, there were 70% of monuments that were in satisfactory state in 2010.**

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 SR

Historical settlement structures	2009	2010
Town reserves	18	18
Folk architecture reserves	10	10
Historical preserved parks	48	70
Monument zones	85	83

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

Act 208/2009 Coll. adopted in 2009 amended the Act 49/2002 Coll. on the protection of monuments as amended by the Act 479/2005 Coll., and became effective on June 1, 2009.

In 2010, the Ministry of Culture of the SR drafted the **Resolution 253/2010 Coll.** executing the Act 49/2002 Coll. on the protection of monuments as amended.

♦ Restoration of cultural monuments

In 2010, there was 4 637.6 thous. EUR in contributions by the MoC SR to the restoration of national cultural monuments in the SR within **317 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"

	2005	2006	2007	2008	2009	2010
Number of projects	323	513	389	370	396	317
Total funding (€)	3 141 738	3 861 615	3 640 510	5 413 978	11 062 751	4 637 615

Source: MB SR

World Heritage

♦ Sites enlisted under the World Heritage List

In 2010, the **World Heritage List** of the UNESCO contained **921** sites (including 673 cultural, 180 natural, and 27 mixed) from **153** signatory countries to the *Convention concerning the protection of World culture and natural heritage*, and has been ratified by 187 states as to date.

Trend in total number of sites in World Heritage List

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of enlisted sites	**721**	**730**	**755**	**788**	**811**	**851**	**878**	**887**	**890**	**921**
including cultural	554	563	582	611	630	660	679	688	689	714
natural	144	144	150	154	159	166	174	174	175	180
mixed	23	23	23	23	23	23	25	25	26	27
Number of Convention signatory countries	-	125	134	134	137	141	145	148	151	153

Source: MoC SR

In Slovakia, **seven sites** were put on the World Heritage List **as of 2010:**

Under cultural heritage

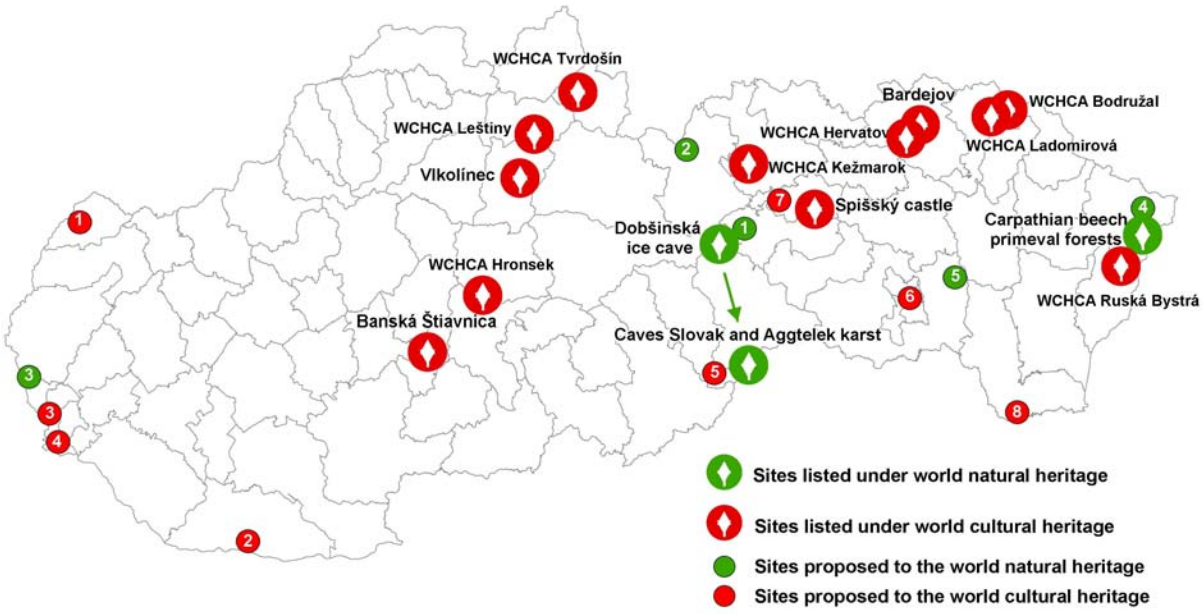
- **Vlkolínec** Folk Architecture Reserve, local district of Ružomberok (Cartagena, 1993),
- **Levoča, Spišský castle** and related cultural monuments (Spišská Kapitula, Spišské Podhradie, Church of the Holy Ghost in Žehra), historic center of Levoča and handiwork of Master Paul in Levoča (Cartagena, 1993, 2009),

- **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),
- **Carpathian Beech Primeval Forests** (Christchurch, 2007), together with Ukraine (10 primeval forests) are to be added old beech forests (5) in Germany.

World culture and natural heritage in the SR



WCHCA - Source: SEA

Comparison of the number of World Heritage (WH) sites with the surrounding countries to 2010

Country	Number of WH sites (cultural + natural)
Slovakia	5 + 2
Czech Republic	12 + 0
Poland	12 + 1
Hungary	7 + 1
Austria	8 + 0
Ukraine	3 + 1

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 2010 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. **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

3. **Nature and cultural landscape in the sub-Danubian region** (anticipated common proposal with the Czech Republic),
5. **Geyser in Herľany**.

Geoparks

Geopark represents a territory including one or more scientifically important sites, not only from the biological point of view, but also in terms of its archaeological, economic, or cultural uniqueness of the European significance.

Support in geopark building in Slovakia is based on the Slovak Geoparks Strategy approved by the SR Government Resolution 740 of October 15, 2008.

In 2010, there were **three** managed **territories of national geoparks**:

- Geopark of Banská Bystrica
- Geopark of Banská Štiavnica
- Novohrad Geopark (a geopark located across the national border with Hungary: Novohrad – Nógrád Geopark)

Activities within the areas have been focused primarily on building management structures, international cooperation, building of infrastructure, implementation of own strategies and projects. Most significant progress in area management exists in the case of Novohrad Geopark that successfully defended its documentation and became the 37th member of the European Geoparks Network (EGN) at the 4th global geoparks conference organised in April 2010, and the 66th member of the Global Geoparks Network assisted by UNESCO.

ENVIRONMENTAL REGIONALISATION

Key questions and key findings

♦ **Key questions**

- **How is the Slovak territory differentiated in terms of quality of environment and its trend?**

♦ **Key findings**

- **In 2010, 13.5% of the Slovak environment was categorised as impacted or heavily impacted. Compared to 2007, this share has been reduced by approximately 2%.**

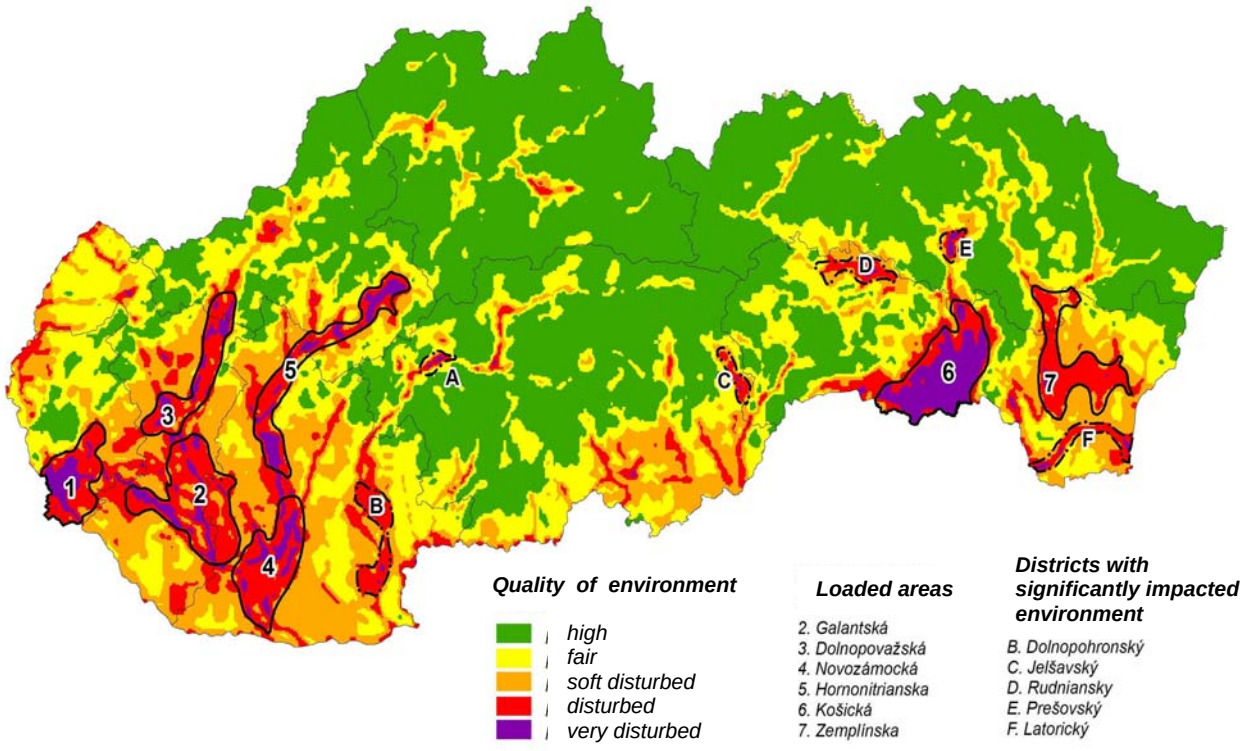
Environmental regionalisation and loaded areas

Environmental regional classification of Slovakia represents a cross-sectional source of information on the state of the environment and reflects its differentiated situation in different parts of the Slovak territory. Slovak regions show diverse load situation for individual components of the environment and the risk factors show various degree of representation in them.

Unified system of selected environmental characteristics under the process of environmental regional classification involves environmental assessment by selected criteria and strategies applied to the environment and environmental impact assessment, selection of regions with the same quality or degree of endangerment of the environment. This is done through analyses applied to individual environmental components (as well as risk factors) and partial syntheses both within specific environmental components as well as among the individual components.

A map assessing the Slovak territory by **5 degrees of quality of environment** developed by the Slovak Environment Agency represents one of the outputs. This map helped identify the most **loaded areas** - their core typically comprises territories within the 5th degree with the most damaged environment. To them were also added territories mainly in the 4th degree of environmental quality, taking into account the geo-morphological, hydrological, and other relevant criteria. Besides thus identified territories, it was necessary to define yet another category of territories with relatively less favourable quality of environment - **districts with significantly impacted environment.** These do not follow the "loaded area" category by their territories, nor by their proportion of the 5th degree of quality of environment, but reflect the remaining environmental issues from the past when they had formed part of the loaded areas (districts A, C, D, E) or have recently been differentiated after new water balance assessments were applied. (districts B, F).

Quality of environment with determined loaded areas and districts with significantly impacted environment



Source: SEA

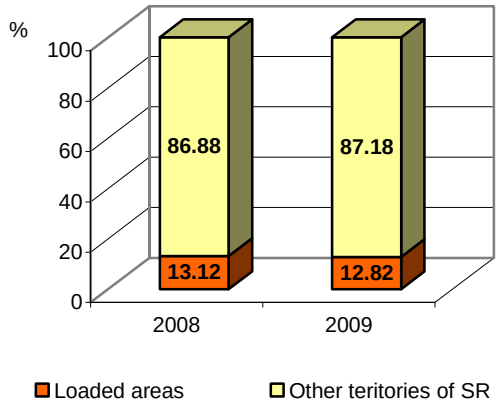
Differentiation of the Slovak territory by environmental quality

Quality of environment	Size (km^2) by 2007	% of the SR size by 2007	Size (km^2) in 2010	% of the SR size	Difference in size (km^2)	Difference %
1 – high quality environment	19 661	40.0	23 007	46.9	+ 3 346	+ 6.9
2 – sufficient environment	12 580	25.7	11 034	22.5	- 1 546	- 3.2
3 – slightly impacted environment	9 055	18.5	8 380	17.1	- 675	- 1.4
4 – impacted environment	5 296	10.8	5 235	10.7	- 61	- 0.1
5 – significantly impacted environment	2 442	5.0	1 378	2.8	- 1 064	- 2.2

Source: SEA

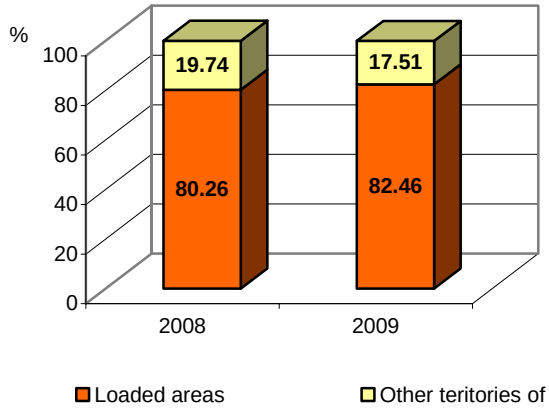
The following charts show that in the area of air pollution, water contamination, and waste generation that have significantly contributed to the state of environment in the territory; and most indicators show that the loaded areas bear 50% - 90% of load in Slovakia documented by individual indicators.

PM emissions from stationary sources in LA



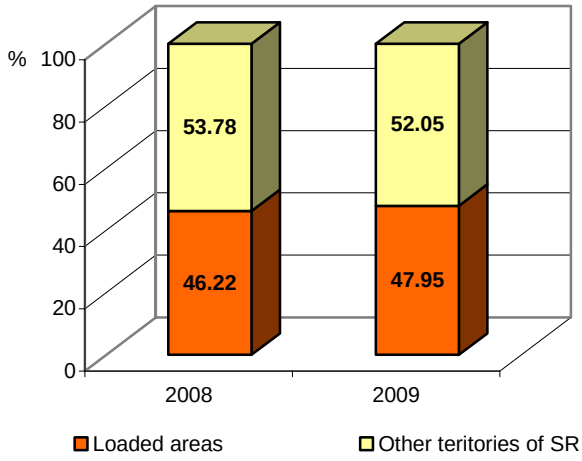
Source: SHMI

SO_2 emissions from stationary sources in LA



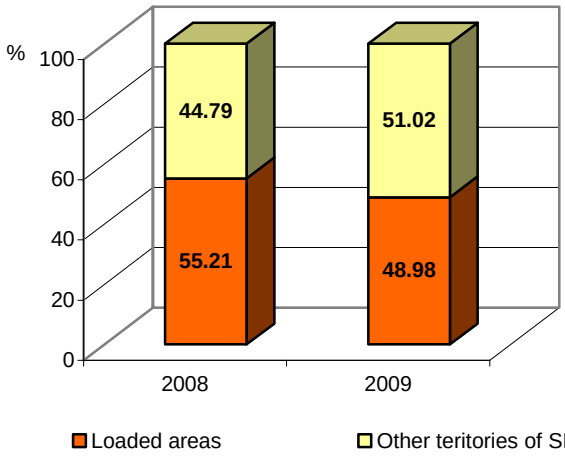
Source: SHMI

NO_X emissions from stationary sources in LA



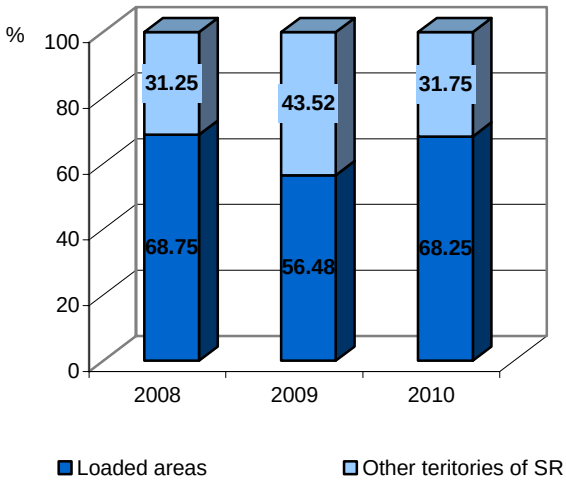
Source: SHMI

CO emissions from stationary sources in LA



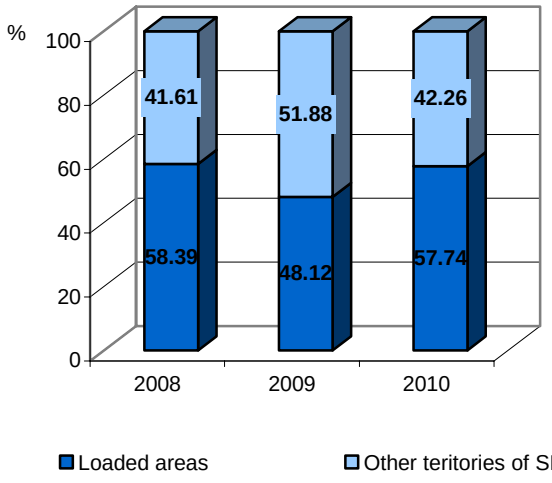
Source: SHMI

Discharged BOD_5 contamination in LA



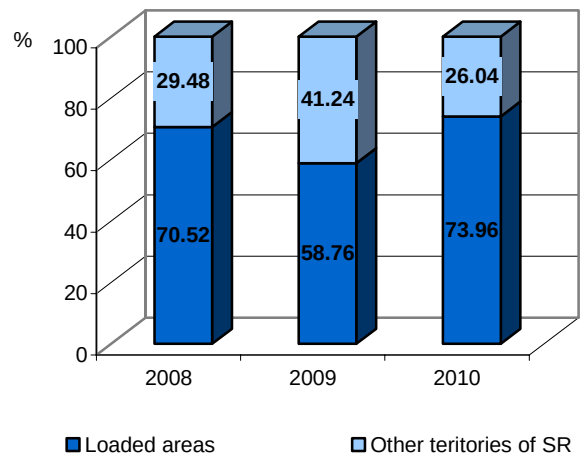
Source: SHMI

Discharged COD_{Cr} contamination in LA



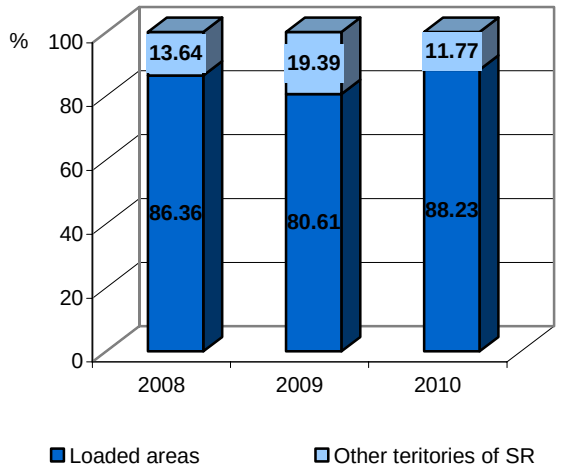
Source: SHMI

Discharged IS contamination in LA



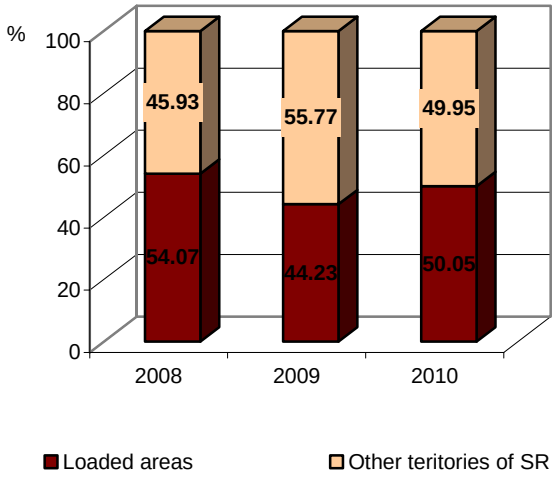
Source: SHMI

Discharged NES_{UV} contamination in LA



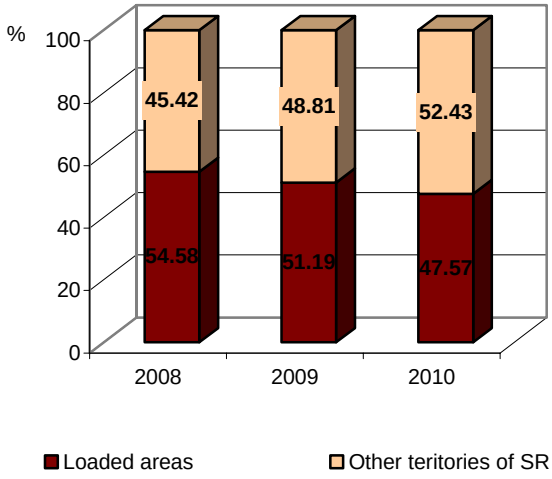
Source: SHMI

Other industrial waste generated in LA



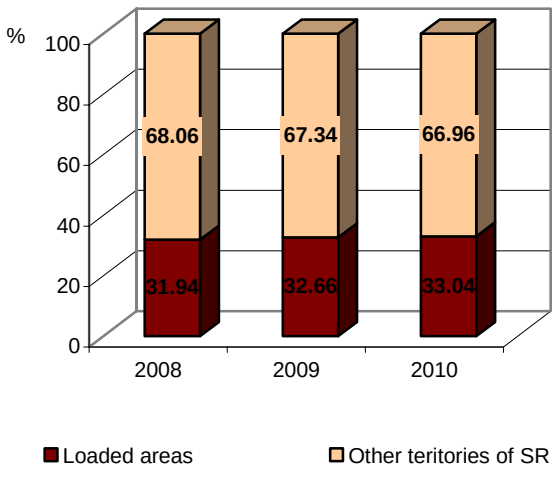
Source: SHMI

Hazardous industrial waste generated in LA



Source: SHMI

Municipal waste generated in LA



Source: SHMI

STATE OF THE ENVIRONMENT - CAUSES AND CONSEQUENCES

• ECONOMIC SECTORS AND THEIR IMPACT ON ENVIRONMENT

Key questions and key findings

♦ **Key questions**

- **What indicates the existing trend in the area of industrial production in terms of its impact on the environment?**
- **What is the trend in the area of mineral extraction activities?**
- **Does the trend in energy demand and energy consumption show positive characteristics in terms of its connection to the environment?**
- **What is the structure of the energy resources and what is the share of renewable energy resources?**
- **What is the trend in traffic indicators and their impact on the environment?**
- **What indicates the existing trend in the area of agriculture in terms of its impact on the environment?**
- **Is there a progress in increasing the proportion of agricultural land types cultivated through ecological agricultural approaches?**
- **Is forest management sustainable?**
- **What is the trend in the area of forest exploitation?**

♦ **Key findings**

- **Energy demand of the Slovak industry is very high. It reaches values that are far beyond the EU 27 and the neighbouring countries' average values. Share of the industry on the GDP creation in 2010 was 30.6%, compared to 26% in 2000. From the long-term perspective (2000 - 2010), there was a reduction in the impact of the industrial production on the environment - surface water abstraction activities dropped by app. 32%, ground water abstraction for the food industry decreased by 17.5%, and by 33.7% for other types of industrial activities. Contamination discharged by industrial waste water dropped, emissions from the industry were decreased by 12.6%, SO2 emissions dropped by 43.6%, NOx emissions dropped by 46.8%, while the PM decreased by 81.2%. Heavy metal emissions also show a decreasing trend, just like other pollutants. In 2010, compared to 2005, there was a reduction in the volumes of generated waste by industrial activities and a reduction in the share of industrial waste from 64.5% in 2005 to 62.4% in 2010.**
- **Over the course of 2010, there was a reduction in the extraction of brown coal and lignite by 377 kt. From the perspective of a long-term trend (2000 - 2010), there were shown reduced volumes in the extraction activities by 2007, with a growth in 2008 - 2009, and a new reduction in 2010. Extraction of ores dropped in 2010 by 4.5 kt, compared to 2009. There has been a significant decrease in the ore extraction activities over a longer time period (2000 - 2010). In 2010, ore extraction activities dropped approximately by 95 %, compared to 2000. Extracted volumes grew for magnesite, building stone, limestone, and raw material for cement production. Extraction of salt, ballasts and sands, and raw material for brick production dropped. Most of the extracted raw material in 2010 did not reach the volumes of 2000.**
- **Energy demand of the Slovak economy decreased significantly due to the PES stability and the growth of the GDP; however, it is still significantly higher than the OECD countries' average. Comparison of the years 2000 and 2009 shows its reduction by 39%. Total end energy consumption since 2000 has shown fluctuation characteristics. Following a growth over the period of 2006 to 2008, it dropped by 8% in 2009. Share of the industry on the end energy consumption in 2009 was 30%, and**

20% for the area of transport. Total energy consumption in transport has increased by 60%, compared to 2000.

- In 2010, total electricity production was 27,720 GWh. Compared 2009, it has grown by 6%. Power plants showed the greatest share on production - 50.7%, hydroelectric power plants - 19.1%, and thermal power plants - 17.5%. The rest goes to the other sources. Production of electricity from renewable sources (RES) has been growing, the share of electricity produced from RES was 18.8% from RES.
- Modal split in passenger transport in 2010 dropped in total. It also dropped, specifically, in aquatic transport, as well as in individual transport types. Modal split in freight transport in 2010 grew in total. The same trend has been recorded in railway and aquatic transport. From the long-term perspective - comparison of the situation in 2000 and 2010, modal split in passenger transport grew only in air transport, while for freight transport it grew specifically in the road and aquatic transport. The negative trend in carried passengers in municipal mass public transport continues over a long term. Number of vehicles in road transport has been growing over a longer time horizon. In 2010, compared to 1998, the number of vehicles grew by 39%.
- In terms of transport share on total emissions of assessed pollutants for 2009, significant is transport share on CO emissions – 29 %, 50% in case of NOx, and 13% in case of NM VOC. In 2009, transport contributed to total PM emissions by 13%, while it contributed to SO2 emissions by 0.37%. Share of transport on heavy metal emissions is app. 8.4%. Volumes of CO2 emissions from transport dropped by 7.2% on a year-to-year basis; however, they grew by 32.6% as of 2000. Noise has an annoying effect and may pose health risks when its intensity is increased. Limit values for noise load on the population are exceeded in a number of areas in Slovakia In 2010, 13,749 m of noise wall barriers were built in the road transport, while 8,517 m of them were built in the railway transport.
- Consumption of industrial fertilisers in agricultural produce in 2010 dropped by 9.3 kg of net nutrients per ha in comparison to 2009. Over a longer time period, this consumption grew in 2010, compared to 2000, by approximately 2%. Pesticide consumption in 2010 increased by 990 tonnes, compared to 2009. Over a longer time period, this consumption grew in 2010, compared to 2000, by approximately 32%.
- >From a long-term perspective (2000 - 2010) there has been reduction in the impact of agriculture on the environment - reduced number of surface water abstraction rate by app. 93.6%, ground water abstraction rate dropped by 31.1%, and contamination by waste water from agriculture decreased by 30.3% in comparison of the years 2004 - 2010, with a change in methodology in 2003. Reduction in individual greenhouse gases emissions from agriculture shows a long-term trend. Greenhouse gases emissions over the horizon of 2000 - 2009 have remained roughly at the same level with slight fluctuations in individual years, with their reduction by 12.3% in 2000; methane (CH4) emissions dropped by 21%, nitrous oxide (N2O) emissions dropped by 7.3%, and ammonia emissions (NH3) by 22%. In 2010, compared to 2005, the number of waste generated in agriculture dropped by 26.4%.
- In 2010, the size of agricultural land within the system of ecological agriculture reached 9.27% of total agricultural land size. Thus, Slovakia reached its objective set at the 7% share.
- Forest ownership structure is changing only slightly, since as to date the process of settling the ownership rights and the use of forest pursuant to the legislation on restitution of property (6.7% of non-identified forestland on total forest land size) has not been completed. Forest land size in Slovakia has been stable. Over a long-term period, the size has been increasing and is currently 41% of total size of the country. Increase in the proportion of natural regeneration (since 2000 it has grown more than three times and now is 39.1%) is seen as a positive trend for carrying out sustainable forest management. Spatial representation of broad-leaf trees is 60.2% with the greatest share of beech (31.8%) and oak (13.2%), and coniferous trees (39.8%) with the greatest share of spruce (25.3%), which gradually leads to reaching the target wood composition. There has been a positive trend also in spatial representation of age degrees, although the actual age composition of forests somewhat differs from their normal (theoretical) age composition. Forest condition in Slovakia has been stabilised over the recent years; however, it is still considered adverse (38% of damaged trees as of 2010), which is a worse situation than the European average. Most damaged tree

types include oak, fir and spruce, the least damaged is hornbeam.

- **Stores of growing stock in Slovak forests has been gradually rising, reaching 462 mil.m^3 of barkless wood matter, with average stock per hectare increased by 11.2% to 239 m^3. Timber felling shows a long-term rising tendency, is has been growing continually since 2000 from 6.2 mil.m^3 up to 9.2 mil.m^3 in 2010. Nevertheless, trend in the timber felling has been impacted by a long-term occurrence of incidental felling that represents 35 to 65%. Forest utilisation (share of felling volumes on wood increment) in Slovakia can be assessed as sustainable. In 2010 it was 82.5%. However, harvested volumes should not exceed 60% of the wood increment volume.**

Industry

♦ Share of manufacturing in GDP generation

Industrial production includes four basic categories, based on the Revised classification of economic activities (SK NACE Rev. 2): **B** - Mining and quarrying, **C** - Manufacturing, **D** - Electricity, gas, steam and air-condition supply, **E** - Water supply, sewerage, waste management and remediation. Classification of economic activities pursuant to SK NACE Rev. 2 began to be applied since 01.01.2008.

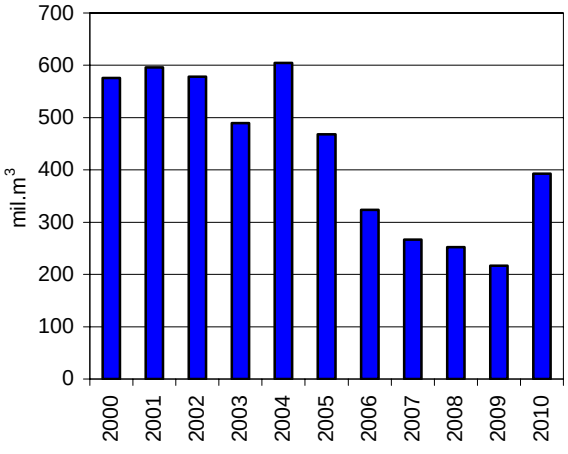
Share of industry on the production of GDP in 2010 reached 30.6%, dropping by 0.7% when compared with the previous year (in 2000, the share of industry of the production of GDP was 26%). **Industrial Production Index** in 2010 grew by 18.9%, compared to the previous year.

♦ Demand of industrial production on the exploitation of resources

Compared to other EU countries, energy demand of the Slovak industry is very high. In 2009, share of industry on total energy consumption in Slovakia reached 38% (in the EU-27 countries it was 24.2%).

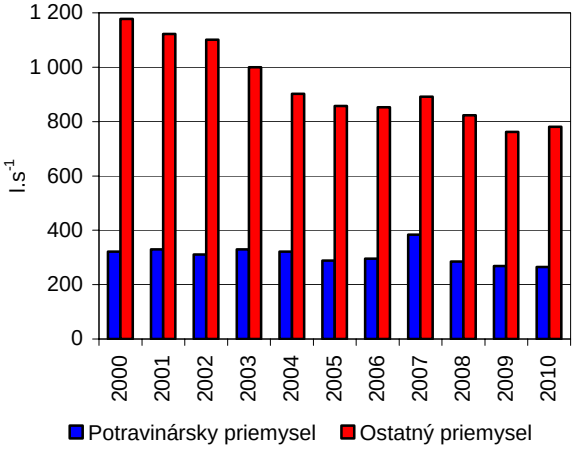
Surface water abstraction by industry shows a fluctuating trend. In 2010, compared with the year 2000, surface water abstraction by industry dropped by 31.8%. In the same year, industry's share on total abstracted volume was 87.9%. Trend in **groundwater abstraction** by industry shows a decreasing tendency.

Development in consumption of surface water in industry



Source: SHMI

Advancement in underground water consumption in industry

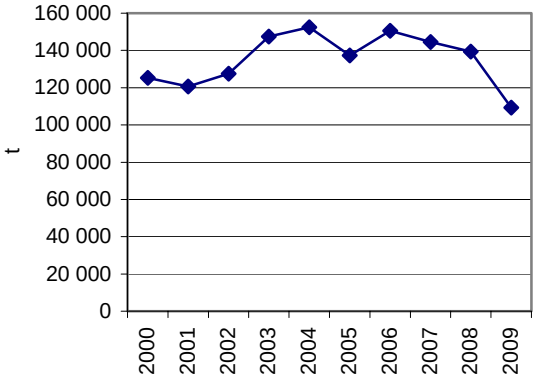


Source: SHMI

♦ Impact of industrial production on environment

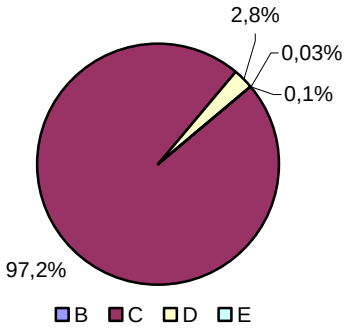
CO emissions from industry in 2009 made up as much as 98.6% of large-size and middle-size stationary sources, and emissions **decreased** by 12.6%, compared to 2000.

CO emissions trend from stationary industrial sources



Source: SHMI

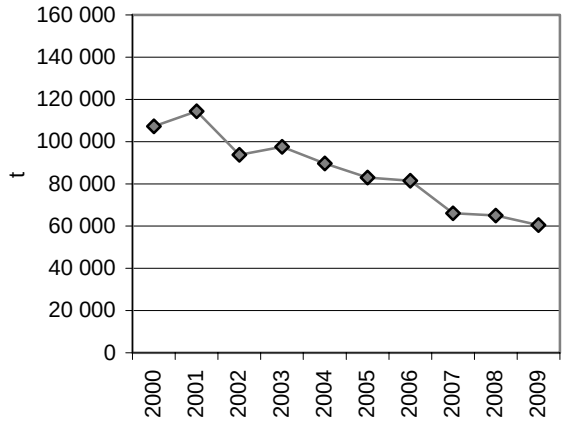
Share of CO emissions from stationary industrial sources on the overall CO emissions in 2009



Source: SHMI

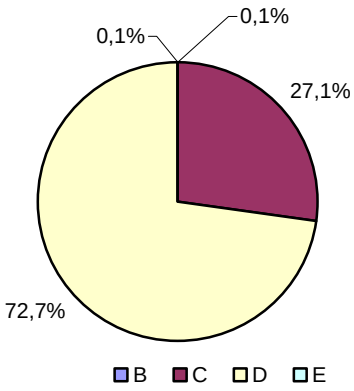
SO_2 emissions from industry in 2009 made up as much as 99.5% of large-size and middle-size stationary sources, and emissions **decreased** by 43.6%, compared to 2000.

SO_2 emissions trend from stationary industrial sources



Source: SHMI

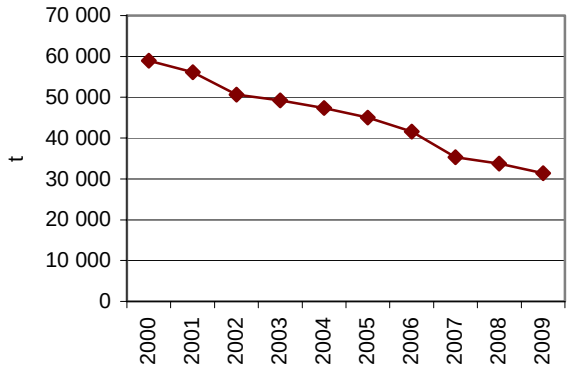
Share of the SO_2 emissions from stationary industrial sources on the overall SO_2 emissions in 2009



Source: SHMI

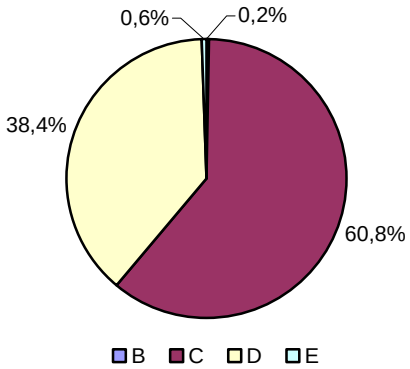
NO_x emissions from industry in 2009 made up as much as 90.4% of large-size and middle-size stationary sources, and emissions **decreased** by 46.8%, compared to 2000.

NO_x emissions trend from stationary industrial sources



Source: SHMI

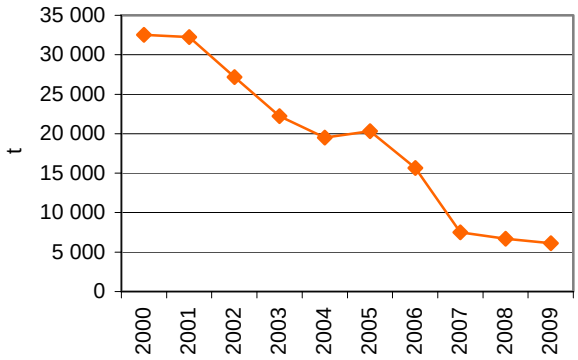
Share of the NO_x emissions from stationary industrial sources on the overall SO_2 emissions in 2009



Source: SHMI

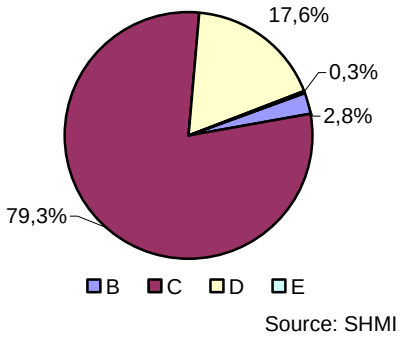
SPM emissions from industry in 2009 made up as much as 93.7% of large-size and middle-size stationary sources, and emissions **decreased** by 81.2%, compared to 2000.

SPM emission trend from stationary industrial sources



Source: SHMI

Share of the SPM emissions from stationary industrial sources on the overall SPM emissions in 2009



Source: SHMI

Heavy metal emissions by industry have had a decreasing tendency since 2000. Nevertheless, in 2009, compared to 2000, there was an increase in the emissions of Cd, Hg, and Cu from industrial technologies, and As and Cu from industrial incineration processes.

Aggregated greenhouse gases emissions from industrial processes showed a fluctuating trend. In 2009, when compared with 1990, greenhouse gases emissions from industrial processes dropped by 10.8%, and by 16% when compared with the previous year.

In 2010, **industry alone generated 5 585 780 tons of waste** (62.4% share in total waste generation), including **270 149 tons of hazardous waste** and **5 315 630 tons of other waste**.

Extraction of minerals

Changes that occurred in 2008 lead to the increasing in the exploitation of the majority of minerals.

Trend in extraction of minerals, 2001-2008

Extracted mineral	Measure unit	2001	2002	2003	2004	2005	2006	2007	2008
Brown coal and lignite	kt	3 761.9	3 661.2	3 508.8	3 101.7	2 513.0	2 208.6	1 851. 56	2 242.82
Crude oil. including gasoline	kt	54.085	51.770	47.943	42.082	33.15	30.5	24. 49	20.8
Natural gas	thous. m^3	195 938	200 812	186 797	178 088	150 851	136 881	500 550	111 823
Ores	kt	1 047.5	719.2	706.5	977.8	651.89	741.9	666.57	479.14
Magnesite	kt	1 573.0	1 464.5	1 640.9	1 668.9	1 555.0	1 467.8	1503.60	1 438.50
Salt	kt	104.0	102.7	104.8	104.3	105.1	122.5	116.76	99.31
Building stone	thous. m^3	3 881.6	4 478.3	4 503.3	4 527.5	6 016.2	6 309.2	6 528.40	7 789.10
Gravel sands and sands	thous. m^3	2 689.4	2 933.1	3 872.7	3 951.7	4 870.1	5 502.9	5 113.50	6 979.40
Brick clay	thous. m^3	442.1	433.4	507.4	591.7	466.8	508.0	1 011.70	512.74
Limestone and cement raw materials	thous. m^3	302.3	332.7	384.9	569.5	690.6	673.5	627.10	757.40
	kt	1 614.6	1 547.4	1 649.4	3 479.8	3 743.3	4 131.2	4 107.80	1 831.50
Limestone for special purposes	thous. m^3	292.3	833.0	941.4	14.9	28.50	67.0	90.30	136.10
	kt	325.0	0.0	0.0	1 057.5	834.80	1 243.6	1 175.70	862.50
High-content limestone	kt	4 211.1	4 356.8	4 093.0	3 767.3	4 053.5	4 393.0	4 362.00	4 035.00
Other raw materials	thous. m^3 surface	1 026.9	1 216.8	1337.2	567.8	509.1	531.6	476.50	490.71
	kt under-ground	142.3	86.4	86.2	91.6	106.5	115.3	139.40	140.60
	kt surface	32.30	31.1	11.8	1 143.9	1 024.0	1 279.3	1 457.45	931.80

Source: MMO SR

Brown coal and lignite extraction in 2008 grow up. Individual mines showed about 391.26 kt of extracted volumes more than in 2007.

Crude oil, gasoline, and natural gas extraction were decreased, compared to the previous year. Total extracted volumes included 18 150 t of semi-paraffin crude oil, and 2 652 t of gasoline. Natural gas stores were decreased by 111 823 thous. m^3.

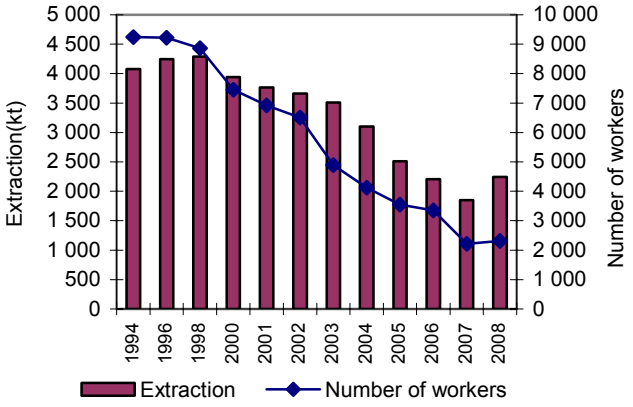
Exploitation of **ore minerals** decreased. The Siderit, Ltd. company in Nižná Slaná has the biggest share on all ore volumes, (443.8 kt). The Slovenská banská Ltd. company in Hodruša Hámre was contributed by 14.74 kt.

In 2008, there was a slight increase in exploitation of **non-ore raw material.** However, 1 438.5 kt of **magnesite** was extracted at three significant magnesite deposits (Jelšava, Lubeník, Hnúšťa), which is a decreasing by 65.1 kt, compared to the previous year.

In 2008, exploitation of **rock salt** (Solivary, Prešov) was at the level of 99.31 kt of salt in salt water. The amount of salt decreased by 17.45 kt compared to 2008.

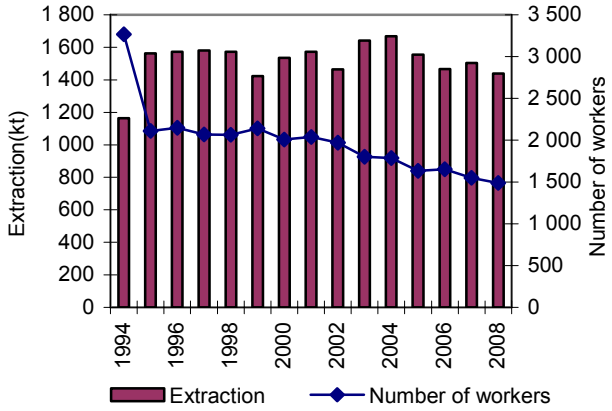
Basic indicators of mineral extraction trend in SR between the years 1991-2008

Trend in brown coal and lignite extraction



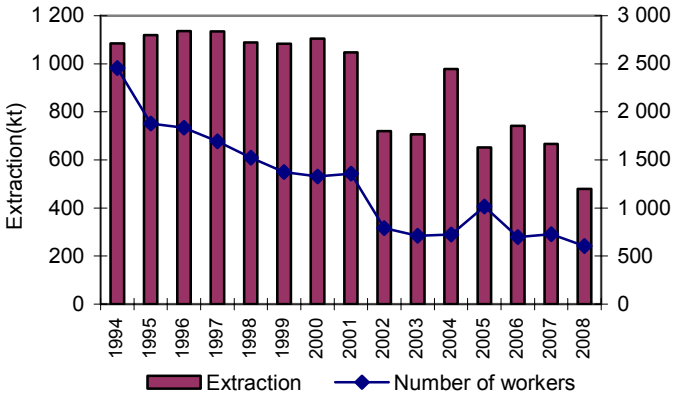
Source: MMO SR

Trend in magnesite extraction



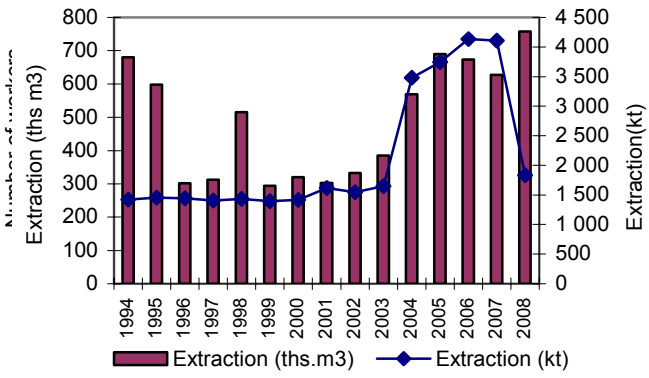
Source: MMO SR

Trend in ores extraction



Source: MMO SR

Trend in limestone and cement materials extraction



Source: MMO SR

♦ Environmental impact of mineral exploitation

The Central mining office keeps records of current mining works including **dumps** and **tailings dumps.** As of December 31, 2008, there were 139 dumps, 97 in extraction site (70 active and 27 inactive) and 26 inactive outside extraction site (40 active and 2 inactive). The territory with located dumps is 286.98 ha.

As of December 31, 2008, there were 40 tailing dumps, 22 in extraction site (15 active and 7 inactive) and 19 outside in extraction sites (13 active and 6 inactive) **tailings dumps**. The territory with located tailing dumps is 18.70 ha.

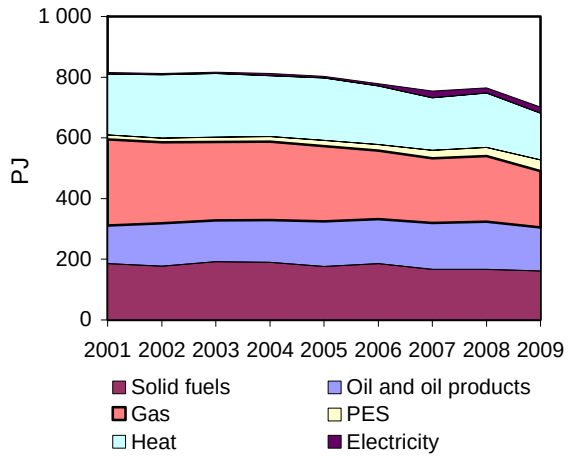
Power engineering, Heat production and Gas management

♦ Energy sources balance

Slovakia has limited stores of **primary energy sources** (PES), due to its geological structure. Domestic PES represents only about 10%, while the country purchases its other energy sources from outside the EU internal markets. (Russia, Ukraine). The only major domestic energy source is brown coal and lignite, with the share of about 94% on total PES. Slovakia is permanently dependent on the import of crude oil (only app. 2% of own sources), natural gas (only app. 3% of own sources), hard coal and nuclear fuel. Dependence of Slovakia on import in 2009 was 66.4%.

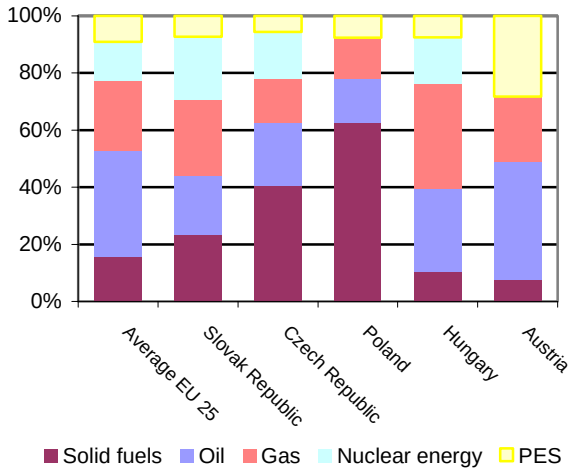
Structure of the used PES in Slovakia since 2001 has been characteristic for its increased consumption of renewable energy sources at the expense of the consumption of other fuel types. Utilisation of nuclear fuels in recent years plays an exceptionally significant role in the PES structure of the SR. Gross domestic energy consumption for the period of 2001-2009 dropped by app. 15%, while the most significant reduction was recorded in 2009, due mainly to the impact of the economic crisis.

Trend in used primary energy sources in the SR



Source: SO SR

Structure of primary energy sources in 2009 – international comparison

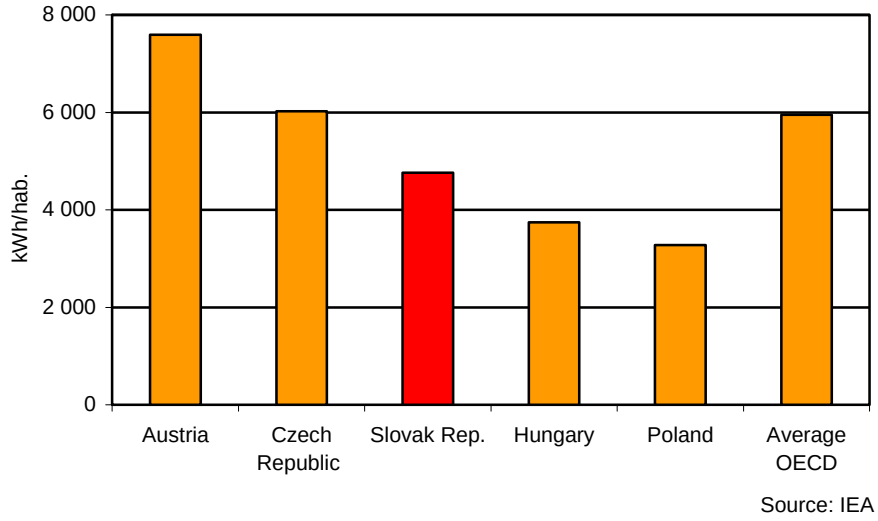


Source: Eurostat

PES consumption in Slovakia is still lower than the average EU-25 consumption, and was about 700 PJ in 2009. In recent years, the PES consumption in Slovakia dropped to its present value of 90% of the EU average.

Final electricity consumption over the period of 2002 - 2010 has shown balanced characteristics with slight fluctuations. The highest growth in consumption has been recorded in the area of commerce and services, with the second highest share on the end electricity consumption of all areas (app.30%). Industry shows the highest electricity consumption, with more than a 45% share.

Electricity consumption per capita in 2009 - international comparison

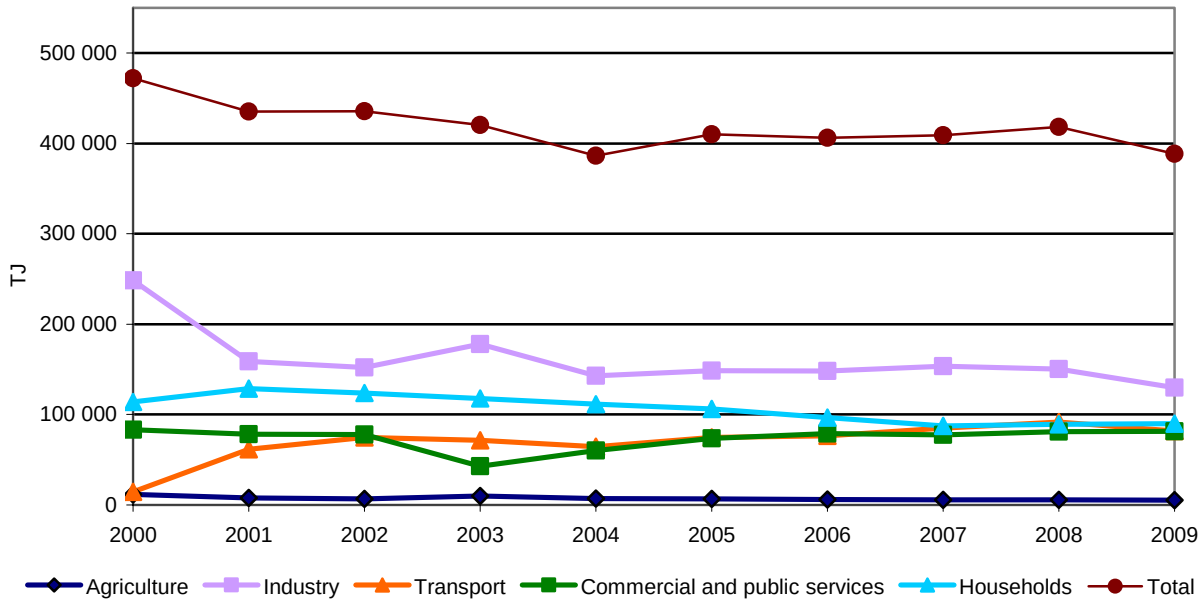


Source: IEA

Final energy consumption since 2000 has shown fluctuation characteristics. After a growth over the period of 2006 to 2008, it dropped by 8% in 2009. Share of industry in 2009 was approximately 30%, while since 2000 it has been stable in most parts. Reduction was recorded in 2009, due to the crisis. Transport represents 21% of total final energy consumption. Total final energy consumption in transport has increased by 60% since 2000.

Major energy consumers in Slovakia also include commerce, services, and households. Energy consumption in these areas has dropped by 15% since 2000.

Trend in final consumption of energy, fuels, electricity and heat in the sectors of economy



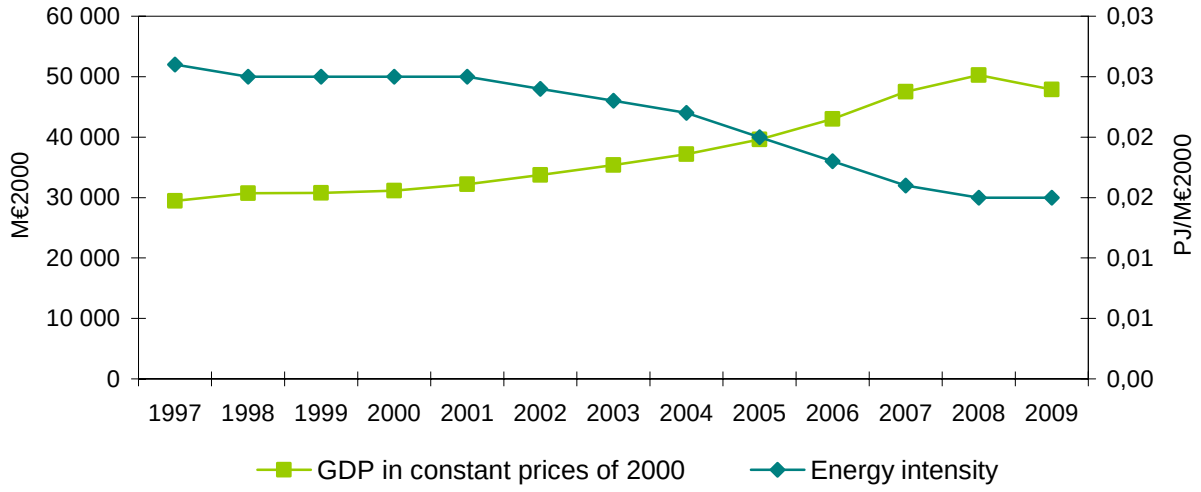
Source: SO SR

♦ 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 energy inland consumption (GEIC) on the generated GDP (GEIC/GDP=EI). 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 1997, 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 energy intensity and GDP in SR



Source: SO SR

♦ Electricity power management

Total **consumption** of the Slovak electricity network in 2010 was 28 761 GWh and in comparison to 2009 it grew by 5%. The maximum annual load reached 4 342 MW. Output structure of the production base was evenly distributed among the nuclear, thermal, and hydroelectric power plants. Import of electricity from outside of Slovakia necessary to cover the needs of the country's electricity network still continued in 2010. International import supplied 3.6% of annual electricity consumption in Slovakia, which is a reduction by 1.2%, compared to 2009.

Total electricity **production** reached 27 720 GWh, with nuclear power plants showing a 50.7% share on production, thermal power plants showed 17.5%, and 19.1% was produced by hydroelectric power plants, while the rest is attributed to the other sources.

♦ Gas management

Slovak Gas Management Industries (SPP) in Bratislava is the dominant company on the Slovak gas market, with the greatest market share (82%). In 2010 it provided services to more than 90% of Slovakia's households, as well as a number of corporate clients. **Total volume of natural gas**

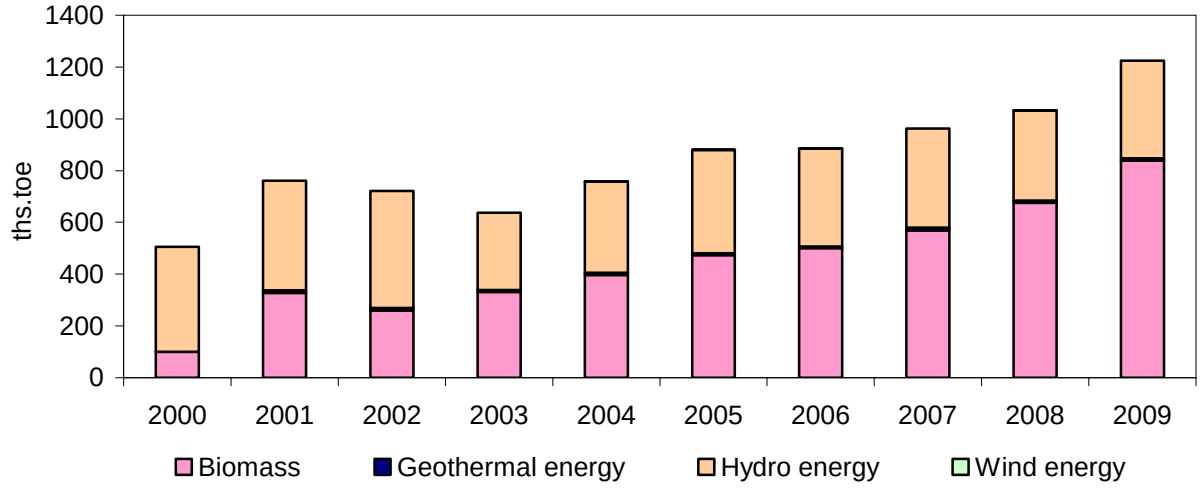
purchased for the purposes of domestic supply in 2010 was 4.95 bill.m^3 (52 529 GWh). The major part of natural gas has been imported from the Russian Federation.

♦ Renewable energy sources (RES)

Slovakia adopted **a national goal** to increase the share of renewable energy sources on the gross energy inland consumption from 6.7% in 2005 to 14% in 2020.

Renewable energy sources in Slovakia show a gradually increasing share on the energy production. In 2009, the share of RES on gross energy inland consumption was 10.3%. Biomass use for energy showed the greatest share (almost 70%).

Trend in the share of individual RES types on total RES production

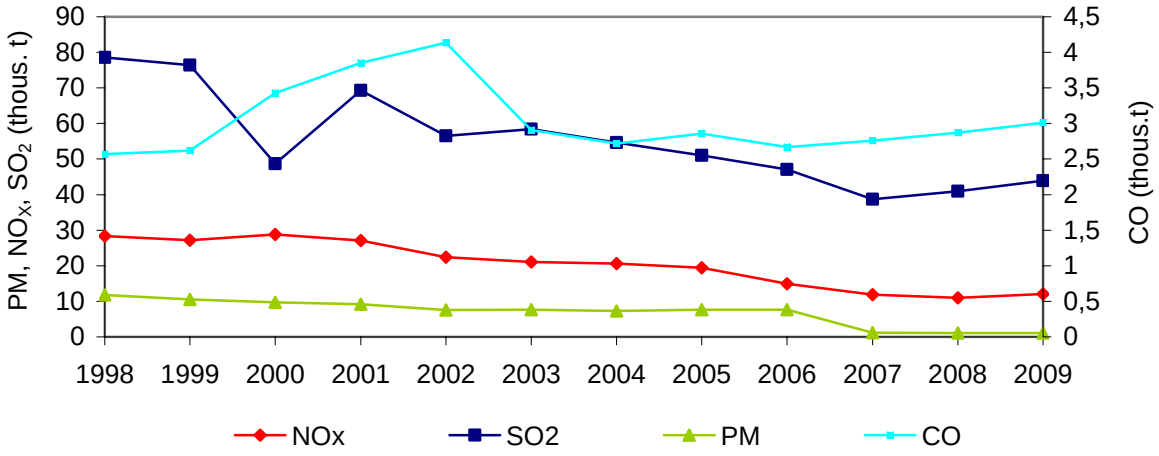


Source: Eurostat

♦ Impact of power engineering, heat and gas management on the environment

Energy production and consumption is accompanied by the **production of basic pollutants**. Until 2007, sulphur 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. However, **since 2007** SO_2 emissions grew by 12%. CO emissions also began to rise (compared 2007 they increased by 9%), with the nitrogen oxides rising very slowly. PM emissions have not changed since 2009.

Trend of basic polluting substances emissions from energy stationary sources in the SR

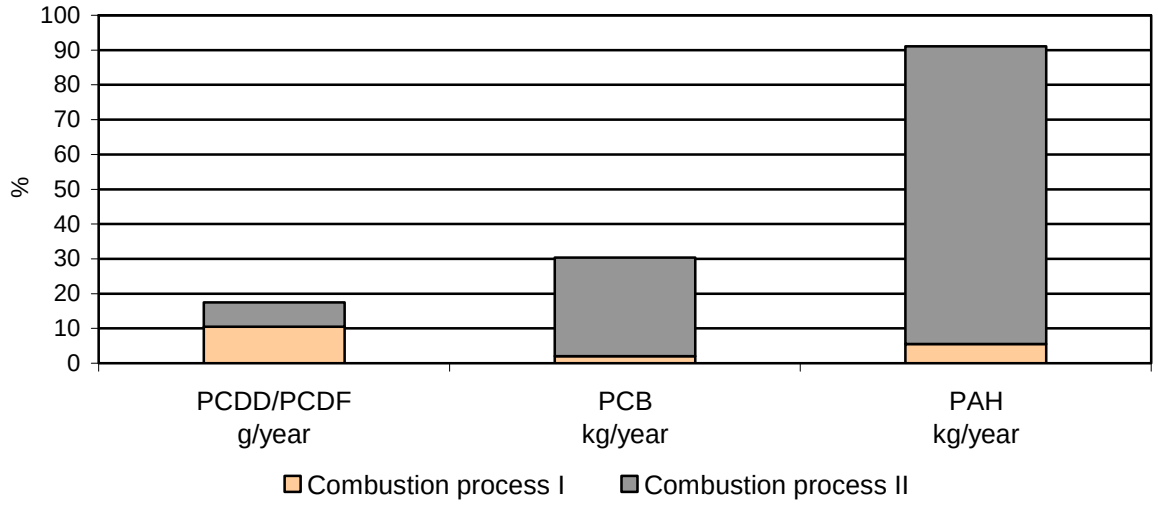


Source: SHMI

Power engineering shows the greatest share by **greenhouse gases emissions** that in 2009 (including transport with the share of 21.6%) represented 66.1% (28 694.32 Gg of CO_2) of total greenhouse gases emissions in Slovakia. The year-to-year reduction compared to 2008 has been 8.4%. Significant reduction in 2009 was caused by the consequences of the global financial crisis in 2008 and the subsequent economic recession in 2009 that impacted mostly the power industry and industrial production.

Persistent organic pollutants (POPs) and heavy metal emissions within the power industry area also include Combustion process I (systematic power industry, municipal power industry) and Combustion process II (heating of commerce and services, heating of households). The POP emissions have a falling tendency since 1990. This is caused by a decline in the production and changes to fuels used for household heating. Emissions from combustion process I dropped in average by 30% compared to 2008, while emissions from combustion process II dropped only minimally.

Share of POPs emission from sector of energy to overall POPs emission in the SR in 2009



Source: SHMI

In cases of **heavy metal** emissions from Combustion process I, compared to 2008, the year 2009 showed a negative trend in Pb (increase by 45%), Cd (increase by 46%), Hg (increase by 30%), and Zn (increase by 44%) and a positive trend in Ni. (reduction by 80%) In the group of Combustion processes II, positive trend was recorded in As (reduction by 17%) and Mn. (reduction by 17%) Other heavy metal emissions between the last two years showed only a slight change. Mn exceeded the 15% share on heavy metal emissions from power engineering in 2009.

Of all areas within the energy sector, electricity power management contributed the most to total volumes of **discharged waste water**. Waste water produced by electric power plants mainly includes water from technological and cooling processes, and also some run-off water. Waste water 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. Compared to 2009, volumes of **discharged water** from the heating industry grew by app. 5.5%.

Waste water discharged by energy production in 2010 (electricity production and distribution)

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	14 459.964	179.520	23.577	183.542	0.795
Untreated	9 908.049	75.624	3.338	18.851	0.331
Subtotal	24 368.013	255.144	26.915	202.393	1.126
Waste water from heat production					
Treated	1 090.033	16.453	1.804	23.242	0.175
Untreated	1 098.305	2.339	0.000	1.770	0.011
Subtotal	2 188.338	18.792	1.804	25.012	0

Source: SHMI

In 2010, the sector of energy and gas industries generated 877 644.33 tonnes of **waste introduced to the market,** which represents an increase in production by 4%, compared to 2009. Hazardous waste represented only 0.61% (5 358.07 t), while other waste represented 99.38% (872 286.26 t). The economic activities classification shows that this section of economic activities contributed with a 9.8% share to the total waste production in 2010.

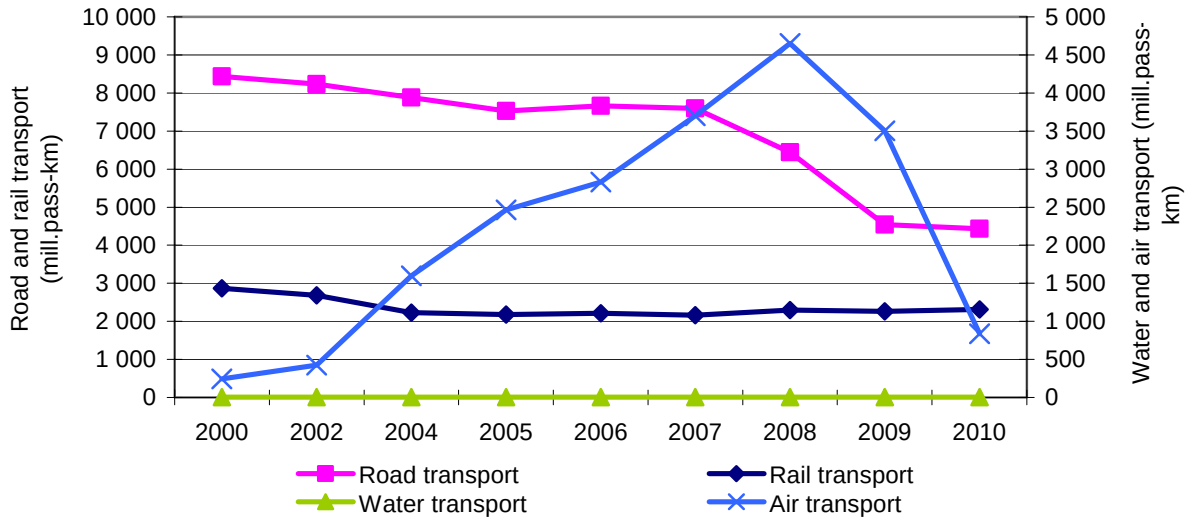
Transport

♦ Passenger and freight transport

In 2010, **passenger transport** by the public road and railway transportation showed a minimum reduction in the number of carried passengers. In terms of modal split in road transport, aquatic and railway transports, the numbers have remained at the level of last year. Reduction is still shown for the number of carried passengers as well as modal split in air transport (from 2 288 thous. passengers carried in 2009 to 554 thous. in 2010) This decline has been caused not only by the economic crisis, but also by ceased operation of two major airliners in Slovakia.

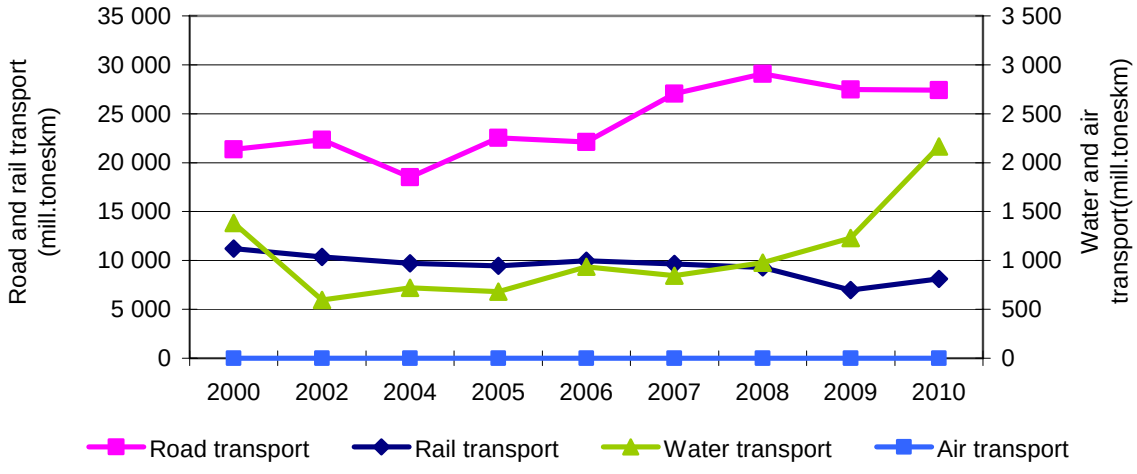
Freight transport and **modal split** in 2010 increased in 2010 for railway, water, and air transport. Road freight modal split in 2010 dropped by more than 12%, compared to 2009. A significant growth has been seen in the railway freight transport (16.4%) and water freight transport (76.1%). Air cargo transport has grown slightly from 7 tonnes to 11 tonnes.

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



Source: SO SR

Freight transport demand by mode (mil. tkm)



Source: SO SR

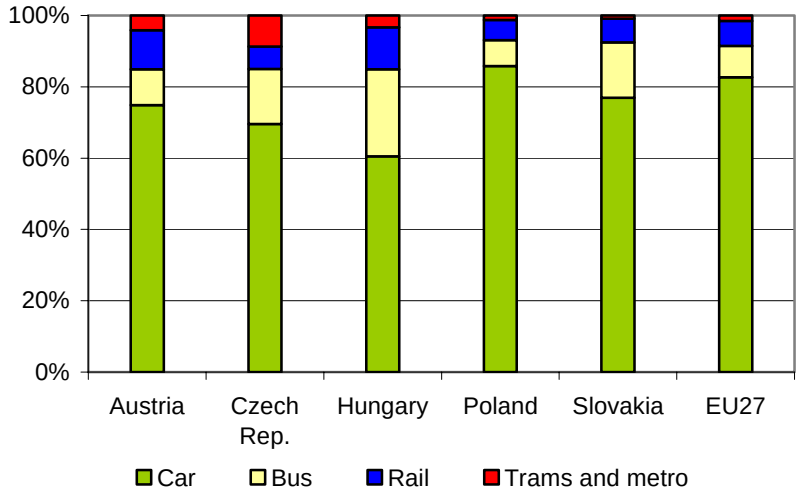
City transport enterprises of Bratislava, Košice, Prešov, and Žilina operate the municipal mass passenger transport (MHD). In 2010, lingered decreasing in the number of carried passenger. Over the period of 17 years (1993-2010), there was reported a 23.8% decrease in the number of carried passengers. 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	2001	2003	2005	2006	2007	2008	2009	2010
Total number of transported passengers (ths.)	373 269	394 465	395 064	400 673	403 466	399 425	389 263	385 594
Trams								
Transported passengers (ths.)	98 719	104 560	109 101	109 836	109 705	107 080	100 871	97 739
Seat kilometres (mil. km)	1 866	1 764	1 822	1 797	1 792	1 788	1 793	1 782
Trolleybuses								
Transported passengers (ths.)	53 167	59 034	58 032	59 071	60 655	62 038	62 745	62 236
Seat (mil. km)	1 008	1 110	1 075	1 085	1 104	1 099	1 111	1 125
Buses								
Transported passengers (ths.)	221 383	230 871	227 931	231 766	233 106	230 307	225 647	225 619
Seat (mil. km)	3 996	3 899	3 846	3 823	3 839	3 826	3 980	4 202

Source: SO SR

Modal split of passenger transport in 2009 (percentage of passkm)



Source: Eurostat

♦ Number of vehlices

In 2010, total number of motor vehicles grew **by 102 850 pcs** compared to 2009. This means an increase by 39% over the monitored time period of 1998 - 2010. All categories show an increase in the number of road motor vehicles in 2010. The cars in Slovakia age, just like in the neighbouring countries, and a minimum improvement to the cars' average age requires at least twice as many cars sold. Number of transport vehicles in railway and aquatic transport (most environmental-friendly transport modes for passengers and goods) dropped by app. 45% over the last 10 years.

Number of motor-vehicles by individual types (pcs)

Total number of vehicles	2001	2003	2005	2006	2007	2008	2009	2010
Passenger cars	1 292 843	1 356 185	1 303 704	1 333 749	1 433 926	1 544 888	1 589 044	1 669 065
Trucks and Pick up vans	120 399	142 140	160 089	172 781	196 141	227 218	246 667	252 866
Special vehicles	36 082	32 033	22 648	18 708	18 983	19 675	18 947	20 462
Road tractors	4 994	8 851	14 141	16 475	19 556	21 444	22 655	23 183
Buses	10 649	10 568	9 113	8 782	10 480	10 537	9 400	9 350
Tractors	63 422	61 690	46 544	43 888	44 098	45 387	45 769	46 092
Motorcycles (excl. small)	46 676	48 709	56 366	58 101	63 897	70 318	55 443	59 563
Trailers and Semi-trailers (included bus)	206 627	218 517	188 411	188 256	199 329	211 555	218 724	226 333
Others	1 507	1 161	101	535	3 414	7 159	29 959	32 444
Total	**1 783 199**	**1 879 854**	**1 801 117**	**1 841 275**	**1 989 824**	**2 158 181**	**2 236 608**	**2 339 358**

Source: ŠO SR

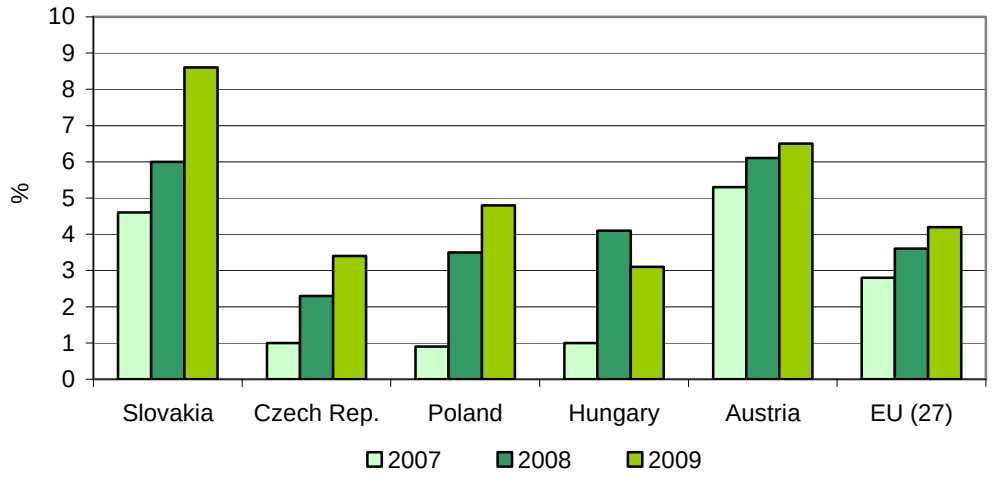
♦ Transport infrastructure

In 2010, the SR transport network included **17 974 km of roads and motorways**. Highways represented 416 km and length of local communication was 25 942 km of the network. The length of **railways** was **3 622 km**, with 1 577 km of electrified tracks. The length of **navigable watercourses** remained unchanged at **172 km**, with channel length of 38.45 km.

♦ Demand of transport on the utilisation of resources

Final energy consumption in the transport sector over the period of 15 years has more than doubled itself. Overall consumption of liquid fuels (97%) 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%). On the contrary, proportion of the end electricity consumption in the sector of transport is by the railway transport (95%), while the end consumption of liquid fuels shows small proportion of the railway transport.

Share renewable energy in fuel consumption of transport



Source: Eurostat

♦ Impact of transport on environment

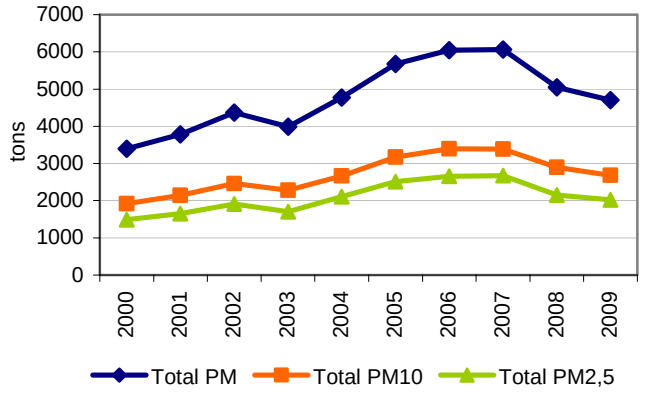
The CORINAIR methodology has been used to determine production volumes of individual monitored harmful substances in the EU countries. Its unique programme product called COPERT is designated to assess and evaluate the annual emission production from road transport. Basic pollutants emissions from transport in 2009 showed minimum reduction compared to 2008.

Trends in emissions of main air pollutants in SR in the years 2000-2009

Year	Annual production of the main air pollutants (ths. t)				
	CO	NO_X	NM VOC	SO_2	PM
2000	117.130	36.550	15.730	0.860	3.775
2001	133.580	39.720	17.310	0.860	4.092
2002	124.770	40.130	15.720	0.800	4.646
2003	110.450	37.310	13.940	0.210	6.092
2004	106.220	42.170	13.770	0.220	5.192
2005	98.680	47.840	13.480	0.240	6.145
2006	83.890	43.720	10.660	0.240	6.547
2007	65.020	48.950	10.120	0.250	6.539
2008	63.520	48.500	9.930	0.260	5.018
2009	60.156	42.886	8.670	0.236	4.996

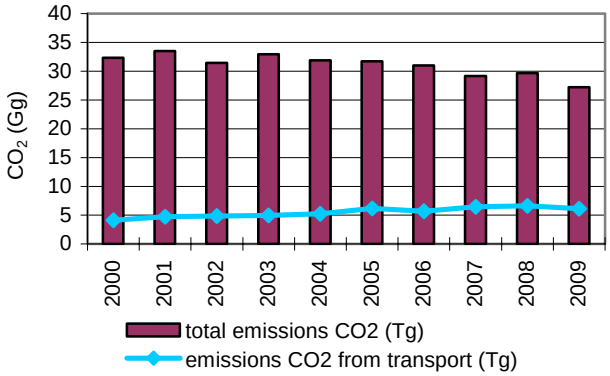
Source: SHMI

Emissions of total PM, PM_{10} a $PM_{2,5}$ from road transport in years 2000-2009 (t/year)



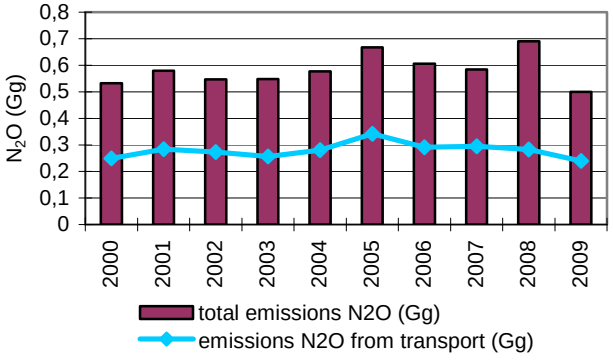
Source: SHMI

Trend in the greenhouse gas emissions - CO_2 from traffic operations compared to total CO_2 emissions in Slovakia (Tg)



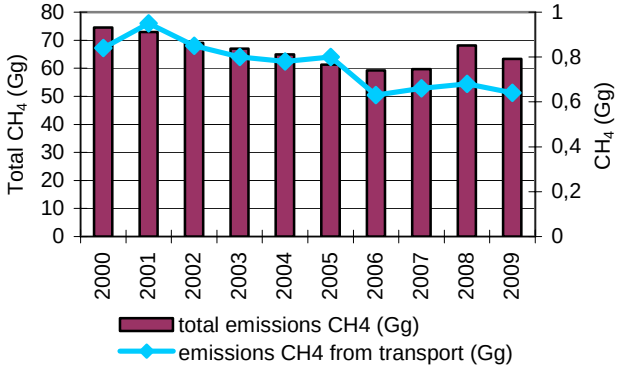
Source: SHMI

Trend in the greenhouse gas emissions - N_2O from traffic operations compared to total N_2O emissions in Slovakia (Gg)



Source: SHMI

Trend in the greenhouse gas emissions – CH_4 from traffic operations compared to total CH_4 emissions in Slovakia (Gg)



Source: SHMI

In terms of transport's share on total emissions of the assessed pollutants for 2009, significant is transport's share on CO emissions – 29%, 50% in case of NO_x and 13% in case of NM VOC. Solid pollutants represented 13% of all emissions in 2009, while the SO_2 emissions showed 0.37%. Transport's share on heavy metal emissions is approximately 8.4%, with copper showing the greatest share on heavy metal emissions by transport (24.0%) followed by zinc (8.1%), and lead (5.6%). Similarly, in case of other heavy metals there was a slight increase in the values of the recorded emissions, compared to the previous year.

In 2009 the CH_4 emissions and N_2O emissions remained at the level of last year. Volumes of CO_2 emissions from transport dropped by 7.2% on a year-to-year basis; however, they grew by 32.6% as of 2000. The biggest contributor to the increase in CO_2 emissions has been road transport - freight vehicles (emissions in 2009 were 2 833.2 thous.tonnes of CO_2) and personal vehicles (in 2009 they represented 2 302.0 thous. tonnes of CO_2 emissions).

Within the area of transport and transport routes in 2010, 120 728 tonnes of **waste introduced into the market** were produced, of which 33 492 tonnes were hazardous waste, and 87 236 tonnes were other types of waste. This represents a decrease by 48 423 tonnes, compared to the previous year.

Directive 2002/49/EC of the European Parliament and of the Council relating to the assessment and management of environmental noise, calls for the creation of noise maps. The Directive initiated the approval of **Act No. 2/2005 Coll. on the assessment and control of noise in the external environment.**

Based on the created noise maps and following the assessment of so-called conflicting plans, final reports submitted by the implementing formations (Strategic noise map, 2006, data released to Public Health Authority) suggest that of total number of 480 600 inhabitants exposed to traffic noise from the 1st category roads and highways outside the Bratislava agglomeration, 193 100 of them live in houses and apartments located in the area with an action value exceeding 60 dB for the L_{dvn} indicator. Of total number of 546 300 inhabitants living in the Bratislava agglomeration, 268 400 of them live in houses and apartments located in the area with an action value exceeding 60 dB for the L_{dvn} noise indicator for road and highway transport, 125 300 inhabitants are exposed to railway noise, and app. 500 inhabitants are exposed to aircraft noise from the M.R. Štefánik airport. Noise studies are done at the planning stage of new transport infrastructure in order to minimize the noise load on the public, and noise wall barriers are built. In 2010, **13 749 m** of noise wall barriers were built in the **road transport**, while **8 517 m** of them were built in the **railway transport.**

Traffic accident rate

In 2010, there was a slight reduction in the number of traffic accidents. The same trend exists in traffic accidents analysis, with reduced number of traffic casualties, heavily injured, and injured, compared to 2009.

Trend of traffic accidents in SR

Indicators		2000	2002	2004	2005	2006	2007	2008	2009	2010
Traffic accidents	Number of accidents	50 930	57 060	61 233	59 991	62 040	61 071	59 008	25 989	21 611
	Killed	626	610	603	560	579	627	558	347	345
	Heavily injured	2 205	2 213	2 157	1 974	2 032	2 036	1 806	1 408	1 207
	Lightly injured	7 891	8 050	9 033	8 516	8 660	9 274	9 234	7 126	6 943

Source: MoI SR, SO SR

Agriculture

♦ Economy of agriculture

In 2010, percentage of agriculture on gross domestic product was about 4%.

♦ Structure of agricultural land

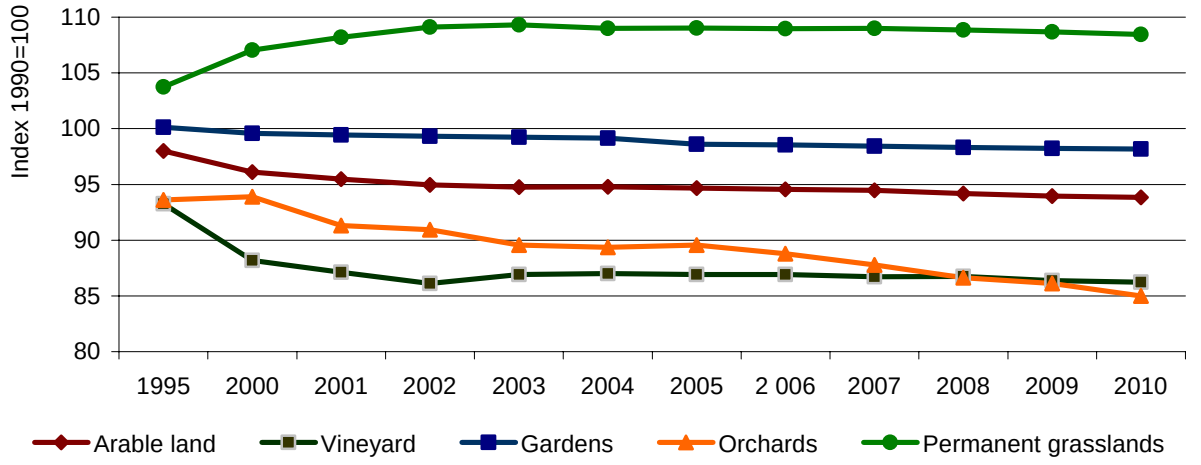
In 2010, **total area of agricultural land in the SR** was 2 414 291 ha. Analysis of the changes to overall values of land types for the year 2010 as compared to 2009 suggests that the **loss of agricultural land** in 2010 (-3 642 ha) when compared with 2009 (-5 545 ha) is smaller by 1 903 ha. Loss of agricultural land was mostly the result of construction activities (1 848 ha) and forestation (1 253 ha). Of the arable land, there were 562 ha transferred to permanent grassland, and 306 ha to other agricultural land types. On the other hand, due to deforestation there were 178 ha of arable land added, along with 1 174 more hectares of non-agricultural and non-forested land added.

Structure of the agricultural land (state to the date 31st December 2010)

Type of land	Area(ha)	Share of agricultural land (%)
Agricultural land total	2 414 291	100.00
Arable land	1 416 633	58.68
Hop-fields	520	0.02
Vineyards	27 091	1.12
Gardens	76 529	3.17
Orchards	17 034	0.71
Permanent grassland	876 484	36.30
Total area of SR	**4 903 644**	**-**

Source: GCCA SR

Agricultural land fund structure after the year 1990



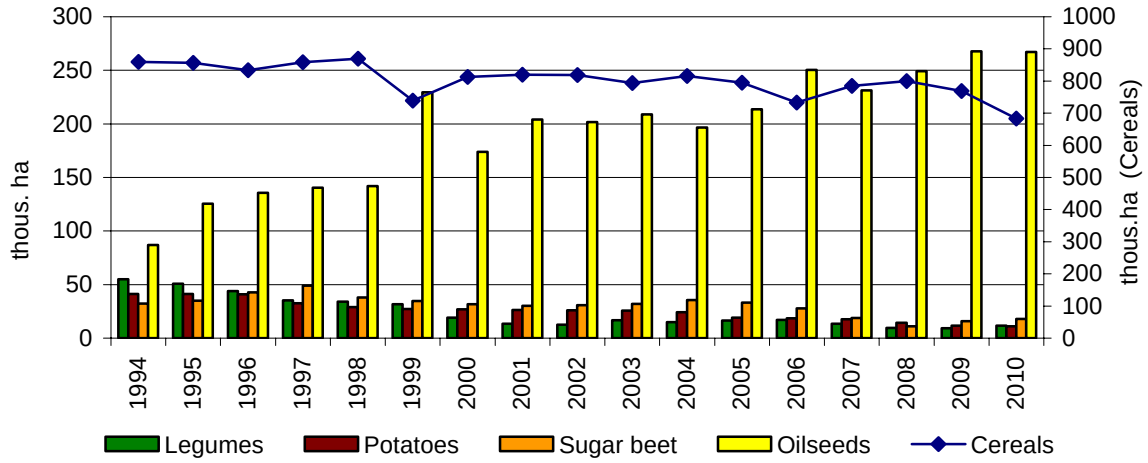
Source: GCCA SR

In 1970, the size of arable land represented 0.37 ha per capita, in 1990 it was 0.28 ha, and 0.2606 ha in 2010.

♦ Plant production

In 2010, **harvest areas of cereals, oilseeds and potatoes** decreased on a year-to-year basis. Harvest areas of legumes and sugar cane increased from year to year.

Harvested areas of agricultural crops



Source: SO SR

In 2010, total area of sown authorised **genetically modified corn** resistant to European corn borer (MON 810) was 1 249 ha, which represent an increase by 374 ha compared to 2009.

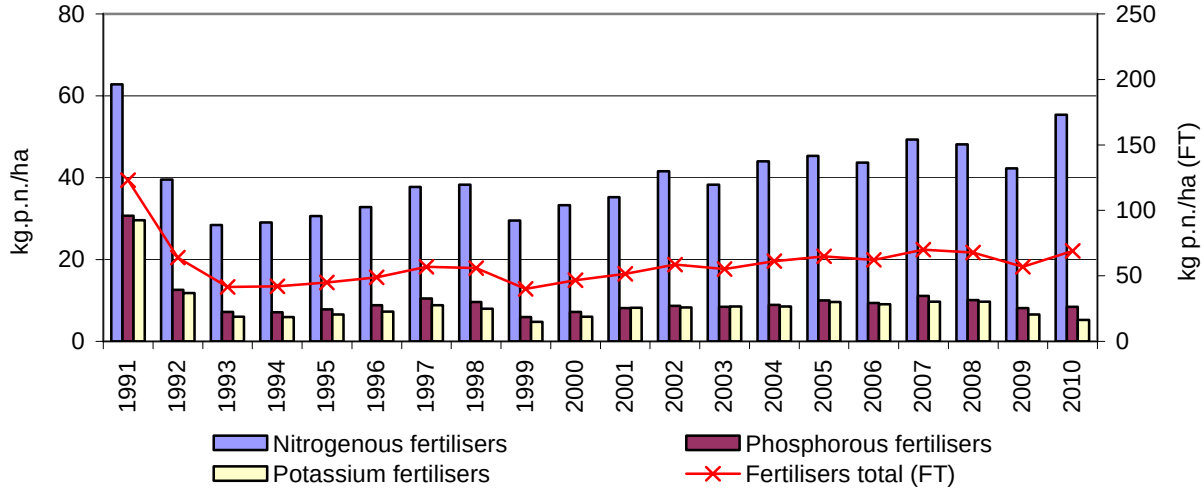
Areas of genetically modified crop in the SR

	2006	2007	2008	2009	2010
Area with sown genetically modified corn (in ha)	33	949	1 942	875	1 249

Source: CCTIA

Consumption of industrial fertilisers in 2010 was **47.7 kg** of net nutrients (n.n.) per hectare of agricultural land, which represents a year-to-year reduction by 9.3 kg of n.n. per hectare.

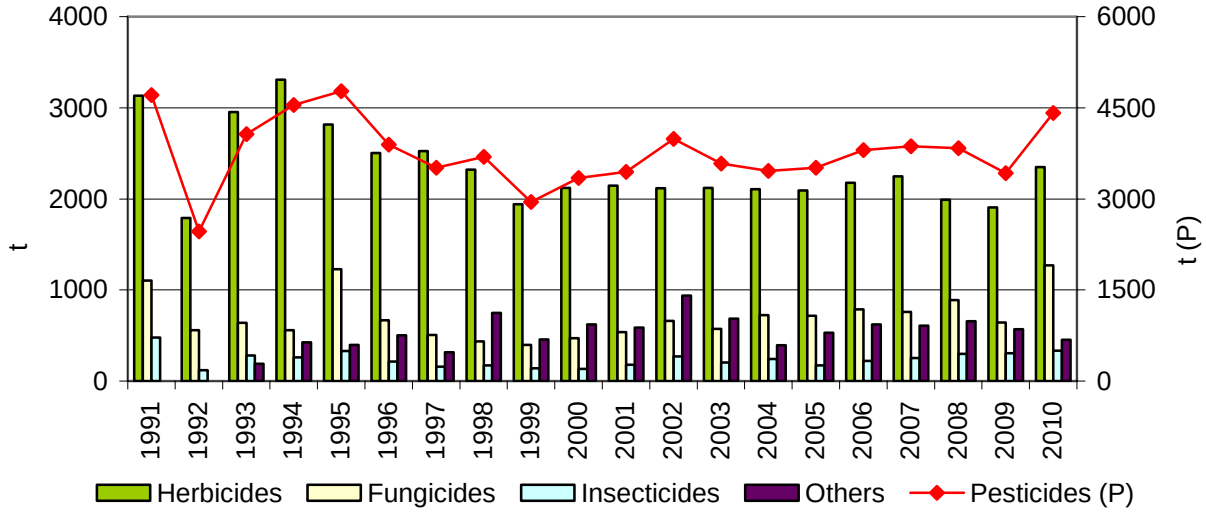
Fertilisers consumption in Slovakia (kg pure nutrient/ha)



Source: CCTIA

Consumption of pesticides in 2010 **grew by 990 tons** as compared to 2009. Altogether, 4 412 t of agents were applied to protect the crop, including 2 351 t of herbicides, 1 273 t of fungicides, 335 t of insecticides, and 453 t of other agents.

Pesticides consumption in Slovakia (t)

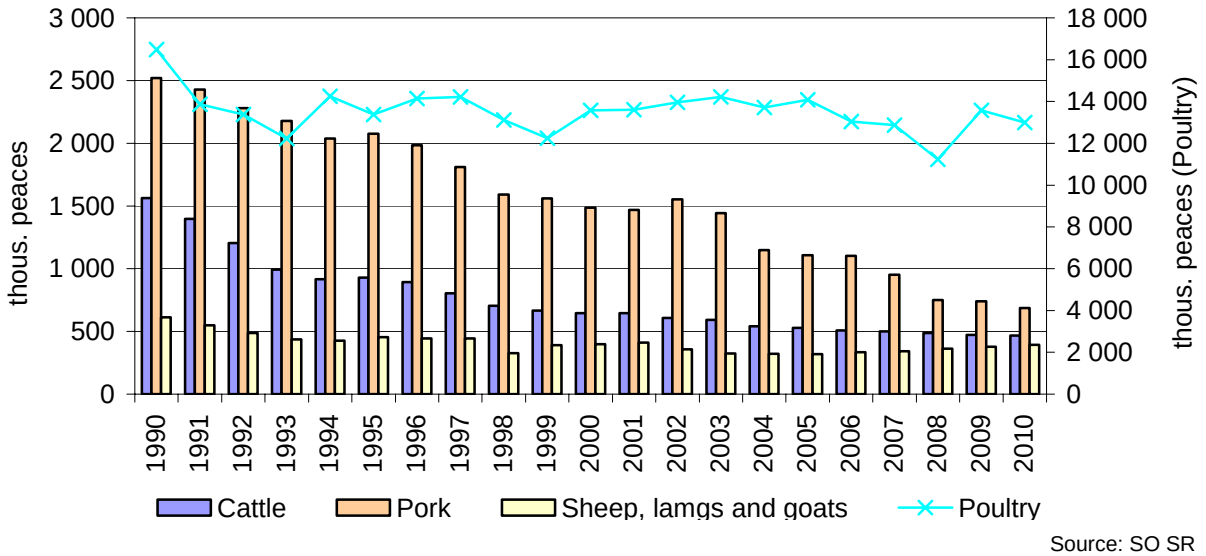


Source: CCTIA

♦ Animal production

In 2010, number of cattle, pork and poultry decreased. This year, an increase was shown in the categories of sheep, lambs and goats.

Number of livestock in Slovakia (thousand peaces)



Source: SO SR

Genetic diversity expressed by the number of livestock breed in the SR in the categories of cattle, sheep, and goats increased in 2010. No change has been seen in pork.

♦ Irrigation

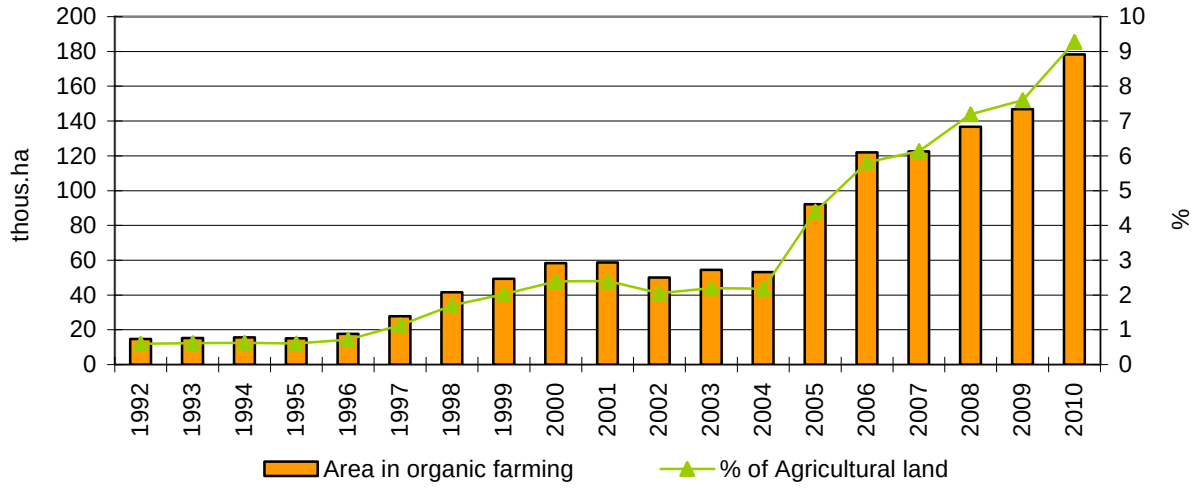
In 2010, 13 642 ha of agricultural land were irrigated, which represents a reduction by 6 706 ha, compared to 2009.

♦ Organic farming

In 2010, the system of ecological agriculture in the SR included **403 subjects** operating **on 178 235 ha of agricultural land**, which is 9.27% of total agricultural land. Compared to 2009, it has increased by 31 473 ha.

Thus, the **objective** of reaching 7% share of the agricultural land designated for ecological agriculture set for 2010 was met.

Trend in the organic farming area



Source: CCTIA

♦ Demand of agriculture on the exploitation of resources

In 2009, there was a year-to-year **reduction in the consumption of fuels, heat and electricity.**

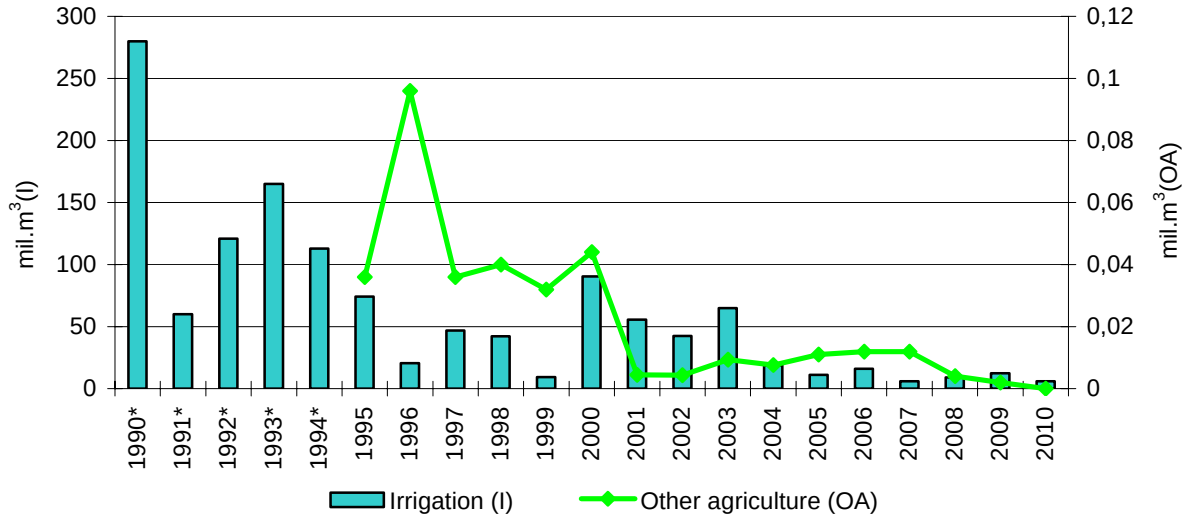
Consumption of selected fuel types, heat, and electricity in agriculture (TJ)

Kind of fuel	2002	2003	2004	2005	2006	2007	2008	2009
Solid fuel	133	131	82	65	55	58	45	33
Liquid fuel	2 665	2 987	3 250	3 417	3 000	2 874	3 001	2 703
Gas fuel	1 869	3 261	1 781	1 670	1 263	1 137	1 257	1 140
Heat	270	300	181	179	168	209	204	166
Electricity	1 850	3 294	1 530	1 411	1 325	1 278	1 195	1 152

Source: SO SR

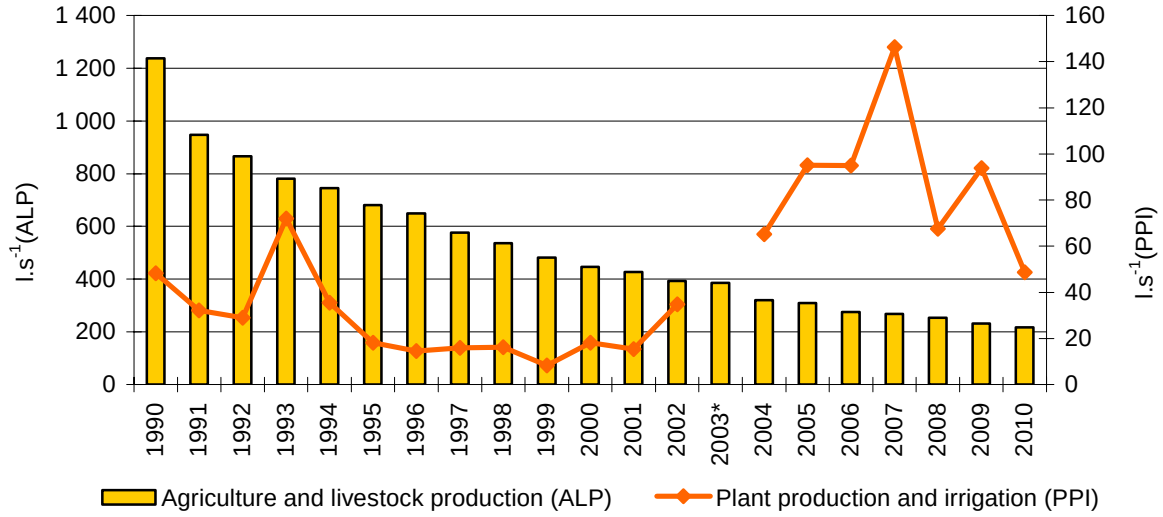
In 2010, there was an overall slight **decrease in the volumes of surface and groundwater** in agriculture.

Trend in surface water use in agriculture



Source: SHMI

Trend in groundwater use in agriculture



** after 2003 there was a change in the methodology of crop production and irrigation*

Source: SHMI

♦ Production of renewable energy from agriculture

The category of biomass for the production of liquid biofuels contains mainly oilseeds and cereals that serve for extracting plant oils, along with their derivatives (e.g. plant oils methyl esters, especially rapeseed oil MERO) and alcohols (ethanol, methanol and their derivatives - methyl-tert-butyl-ether (MTBE), ethyl tert-butyl ether ETBE). The category of biomass for the production of gaseous products contains mainly green carbohydrate forage and livestock excrements. In 2010, there were **17 biogas production facilities** in operation in Slovakia. Biogas was produced from cattle manure at the volume of 17 170.5 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)
Thick-sown cereals - total	379 200	4.4	1 668 480
Maize	144 200	9.8	1 413 160
Sunflower	82 944	4.8	398 131
Rapeseed	16 6 476	8.6	1 431 694
Orchards	-	3.9	-
Vineyards	-	2.1	-
Flight from permanent grasslands	-	3.2	-
Total	**772 820**	**-**	**4 910 000**

Source: ATaTI

♦ Impact of agriculture on environment

Agricultural production processes produce greenhouse gases, mainly methane (CH_4), nitrous oxide (N_2O), and less carbon dioxide (CO_2) and halogenated carbohydrates.

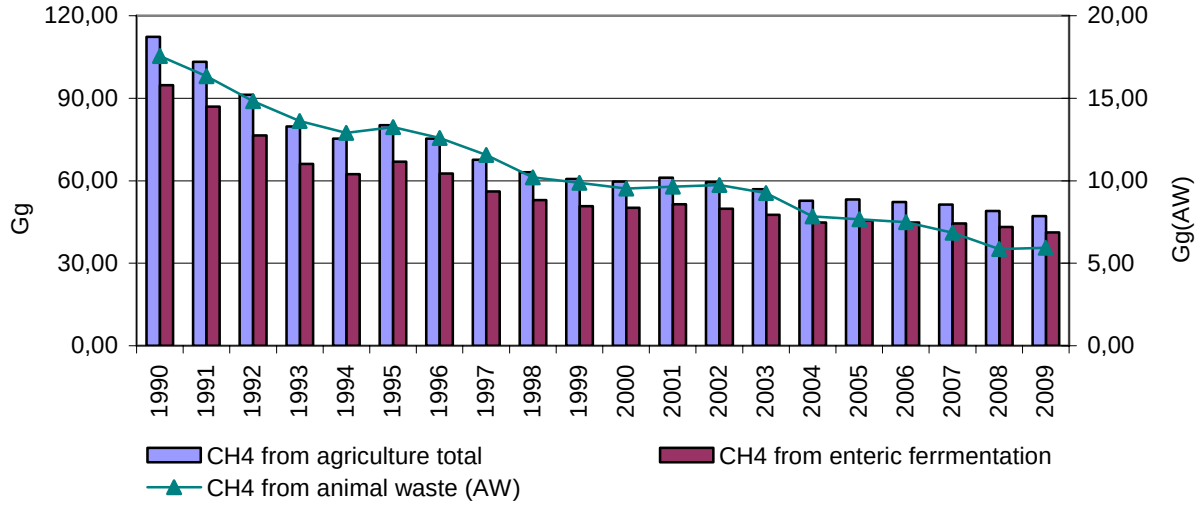
Agriculture belongs to the **biggest producers of methane** (animal production) - large farms of cattle and pork. Methane originates as a direct product of metabolism in herbivores (enteric fermentation) as well as a product of animal excrements breakdown.

Share of agriculture on total methane production has been mostly falling since 1990 due to decreased number of livestock. 47.15 thousand tons of methane produced by agriculture in 2009 represent a decrease by 1.83 tons, compared to 2008.

The main source of nitrous oxide is agriculture (plant production) - excessive amounts of mineral nitrogen in soil (due to intensive fertilisation) and adverse air regime of the soil. (soil compaction).

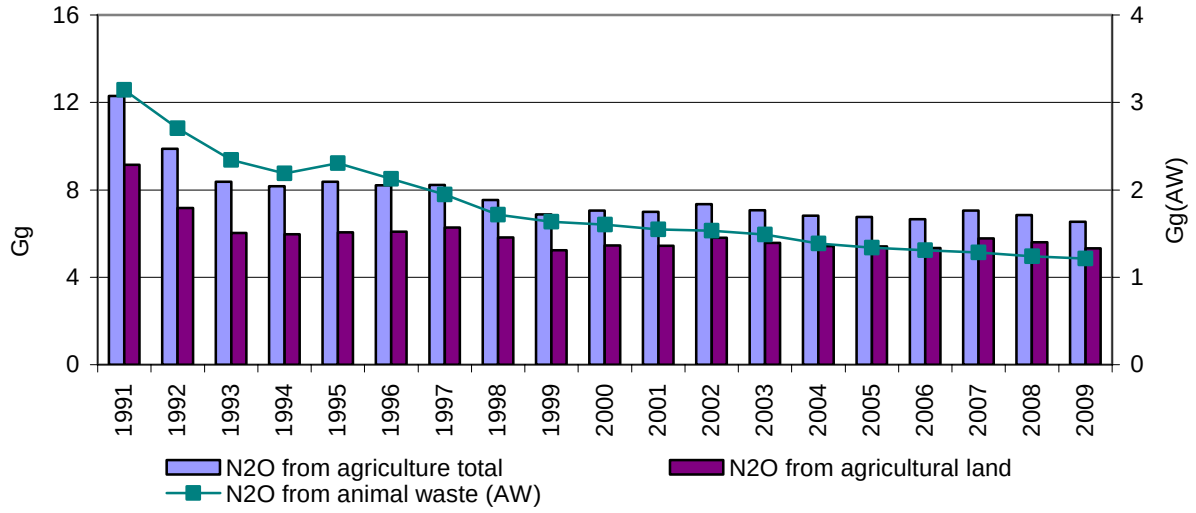
Production of nitrous oxide by agriculture was in most aspects decreasing after 1990. When 6.54 thousand tons of nitrous oxide were produced by agriculture in 2009, the figures decreased by 0.31 tons, compared to 2008.

Trend in methane emissions from agriculture according to type of activity



Source SHMI

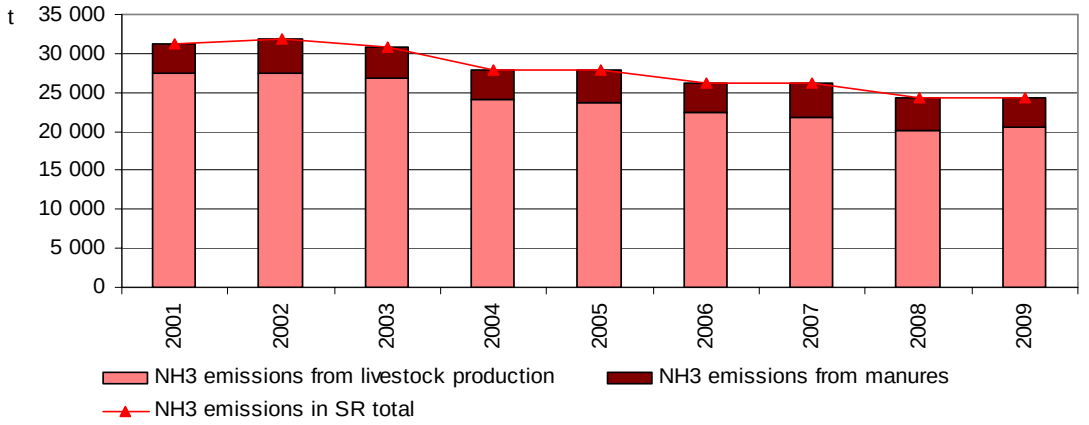
Trend in nitrogen monoxide emissions from agriculture according to type of activity



Source: SHMI

Agriculture is the biggest producer of ammonia (NH_3). Total ammonia emissions in agriculture comprise emissions from livestock production and from agricultural land. **NH_3 emissions show a falling tendency since 1990 in Slovakia.** There were 24 341 t of ammonia produced in agriculture and a reduction by 61 t was recorded from year to year.

Trend in ammonia emissions from agriculture



Source: SHMI

In 2010, the total of 294 899 m^3 of waste water related to agricultural production were discharged.

Discharged amount of waste water in SR related to agriculture in 2010

Waste water from agriculture	Volume ($m^3.yr^{-1}$)	Insoluble compounds ($t.year^{-1}$)	BOD_5 ($t.year^{-1}$)	COD_{Cr} ($t.year^{-1}$)
Treated	33.75	0.39	0.96	2.19
Untreated	261.15	0.00	0.00	0.00
Total	**294.90**	**0.39**	**0.96**	**2.19**

Source: SHMI

In 2010, there were **486 823.11 tons of hazardous and other waste introduced to market,** which is by 10 431.93 t **more than in 2009.** Other waste was 477 685.26 tons, which is by 9 956.17 tons more than in 2009. Hazardous waste in 2010 was 9 137.85 tons, which is by 475.76 tons more than in 2009.

Forestry

♦ Share of forestry on GDP production

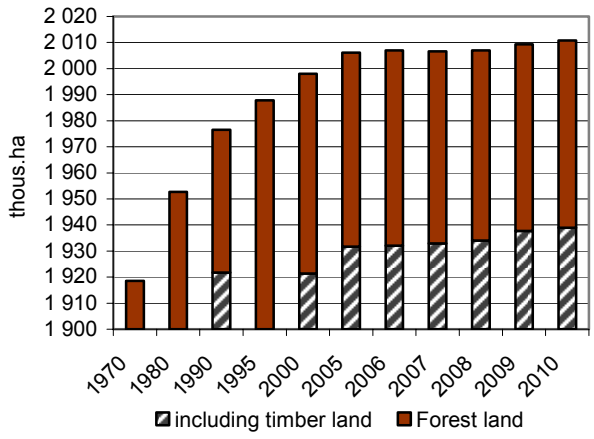
GDP from the forestry in 2010 grew again, after a period of the global crisis aftermath. The GDP value from forestry between years grew by 4.8% in common prices. This has been caused mainly by the reappeared demand for wood, which resulted in growing volumes of deliveries as well as increasing average pricing of timber. Signs of revitalised forest management are seen also in the increased volume of forestry activities.

♦ Structure of forest land

Slovakia belongs to the European countries with the largest share of forested land. Forest cover of our territory has long been stable and is slightly increasing.

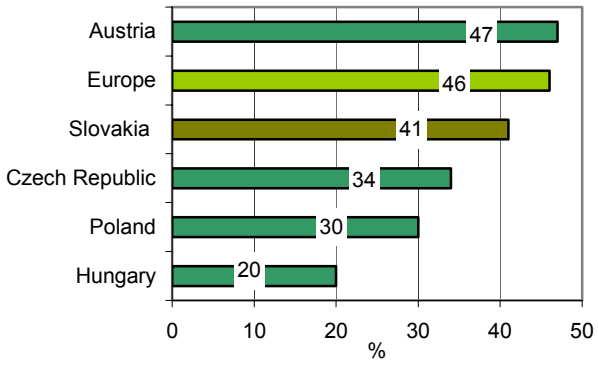
Forest land size in 2010 grew by 1 551 ha, as compared to 2009, which resulted in the growth of forestation in Slovakia by **41%** (2 010 815 ha). Timber land in 2010 represented app. 96.4% (1 938 906 ha) of total size of forest land and similarly, there has been a gradual increase in its size. Calculated to the number of inhabitants, this represents **3.57 km^2 per 1 000 inhabitants**.

Trend in forest land and timber land



Source: NFC

Comparison of forestation in selected countries

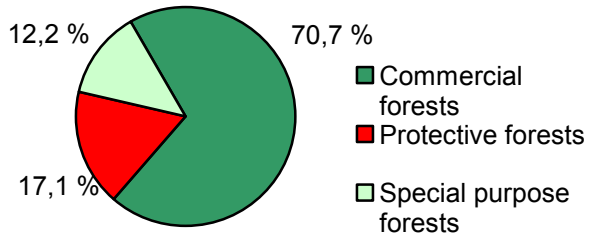


Source: NFC, FAO 2009

State organisations of forest management **administer 55.4% of forests,** which is 14.5% more than in the state ownership. As to date, these organisations have owned **9.2%** of forests that have not been returned and have unclear ownerships, or in which cases the authorised person have still not showed any interest. There was **10 293 ha** of forest land returned to the original owners.

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 17.1%, the size is stabilized since recent years) and also **special purpose forests**. Majority of commercial forests belong to poly-functional forests that also have other associated ecological and social functions, while only 9.5% of commercial forests are located in purely production type.

Spatial representation of forest categories in 2010 (%)



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 (**60.2%**) compared to **coniferous** trees (**39.8%**). Forests in Slovakia show a relatively diverse wood composition with gradual decrease in coniferous trees and increasing numbers of broad-leaf trees. In terms of stability, this is a positive trend. Our forests contain also **25 introduced trees species** with total share of about 2.9% on the Slovak tree species. *Robinia pseudoacacia* is the most invasive tree type. *Negundo aceroides* and *Alianthus altissima* also become problematic.

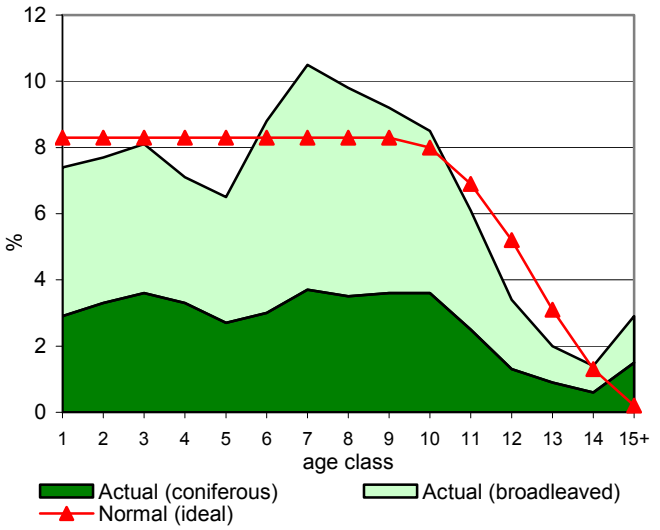
Real **forest age composition** of SR partially differs from the normal (theoretical) one. Clearings take up the area of 9 637 ha. The present age composition shows the middle (6-10) and oldest (15+) age categories above the normal level.

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
Spurce / Fir	4.9/14.1	18.2/6.7	25.3/4.0
Pine / Larch	0.7/0.1	4.2/6.7	7.0/2.4
Other coniferous	0.9	1.2	1.1
Coniferous together	**20.7**	**37.0**	**39.8**
Oak	19.9	17.7	13.2
Beech / Hornbeam	48.0/2.6	35.9/0.93	31.8/5.8
Maple /Ash	3.2/0.4	3.0/0.52	-
Robinia / Birch	0.0/0.1	0.1/0.2	-
Elm / Alder	0.9/0.3	1.2/0.3	-
Poplar / Willow	0.1/0.1	0.2/0.1	-
Other broadleaved	3.7	2.9	-
Broadleaved together	**79.3**	**63.0**	**60.2**

Source: NFC

Age composition of the forest



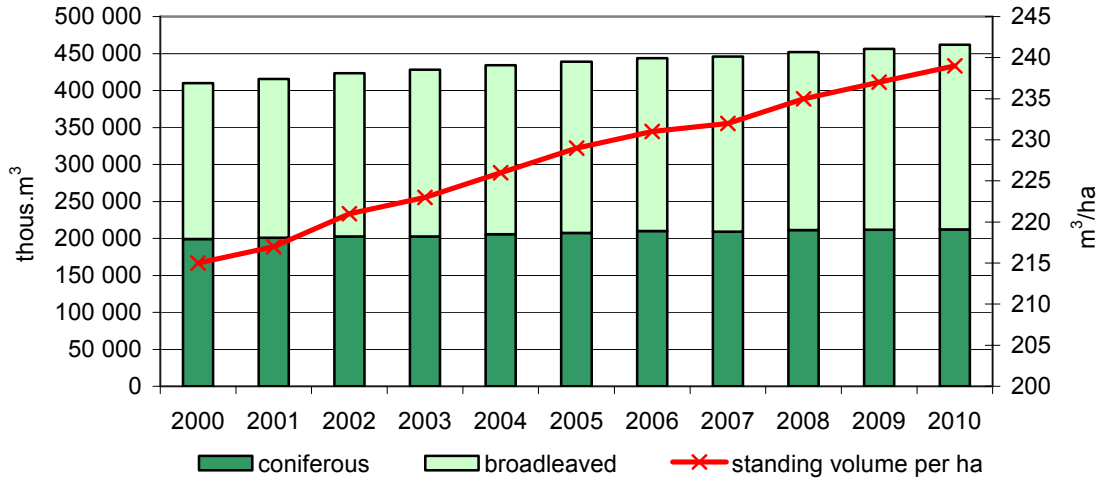
Source: NFC

♦ Forestation and standing volume

Compared to 2009, total scope of **forest regeneration** dropped by 1 720 ha, to the present size of **13 980 ha**, of which **natural** regeneration dropped by 1 097 ha (to reach 5 460 ha) with its share representing **39.1%.**

In the long-term horizon, **standing volume** in the Slovak forests has been on the rise, in 2010 reached **461.9 mil. m^3** of barkless wood matter, with average stock per hectare reaching 239 m^3. **Total current increment** increase at the present time and reached **11 953 thous. m^3** (6.27 m^3 per ha).

Trends in total standing volume



Source: NFC

♦ Timber felling

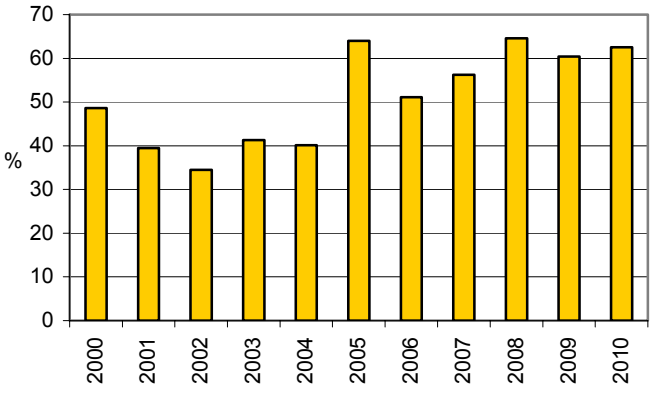
In 2010, timber felling reached **9 859.7 thous. m^3**, which is by 611.6 thous.m^3 (6.2%) more than in 2009. **Incidental felling** included **62.5 %** of total anticipated harvested timber. Especially, due to high volumes of incidental felling, volumes of total timber felling under forest management plan also in 2010 were exceeded by 20%.

Total volume of timber felling and incidental felling (thous. m^3)

Total felling volume	**9 860**
of which: coniferous	6 235
broadleaved	3 625
Incidental felling	**6 159**
of which: exhalation	73.0
insectual	2 891.0
disaster	2 060.0
other	1 135.0
share of incidental felling on total felling volume (%)	**62.5**

Source: NFC, SO SR

Trend in share of incidental felling on total volume of timber felling in SR



Source: NFC

Intensity of forest resources utilisation (share of felling volumes and increment) for this year is as much as 82.5%, which represent increase of 4.6% as compared to 2009. At present, no more than 60% of total current increment volume should be harvested.

♦ Certification of sustainable forest management

There are **two certification schemes** used in Slovakia for forest certification:

- Programme for the Endorsement of Forest Certification schemes (PEFC)
- Forest Stewardship Council (FSC)

Number of certified subjects and area of the certified forests

	PEFC	FSC	Total
Number	296	6	**302**
Area (ha)	1 262 505	140 105	**1 402 610**

Source: Slovakia Forest Certification Association; www.fsc-info.org

♦ Injurious agents and forests condition

As a consequence of negative impacts of wind, snow, frost, drought, and unknown **abiotic factors**, there was **2 306.55 thous. m^3** of wood matter damaged this year, with more than 87.4% caused by the wind. Processed was 89.3% of the wood matter, with 246.66 thous.m^3 remaining unprocessed.

Air pollution belongs to the major **anthropogenic agents**. Forest vegetation (mainly spruce, fir, and beech) exposed to and damaged by air pollution is more vulnerable to be damaged by the abiotic and biotic factors. Size of individual **zones threatened by air pollution** represents the area of **4 202 ha** of forest land.

In 2010, Slovakia registered **123 forest fires**, causing **346.6 thous. EUR** in damages. Compared to 2009 (224 fires) it represents a significant reduction, as a matter of fact, it has been the least number of fires over the last 15 years, which was caused also by weather situation and weather patterns (mainly frequent and intensive rainfalls).

Forest damage caused by anthropogenic agents (thous.m^3)

Agents	Volume of calamity matter		
	Affected	Processed	Unprocessed
Immisions	81.3	72.7	8.6
Fires	0.9	0.8	0.1
Wood stealing	5.3	5.3	0
Other anthropogenic agents	1	1	0
Total	**88.6**	**79.8**	**8.8**

Source: NFC

Of the **biotic injurious agents** of forest land, **European spruce bark beetle** is the most significant injurious agent, with more than 95% contribution to total affected wood matter with **bark-beetles and woodworms**.

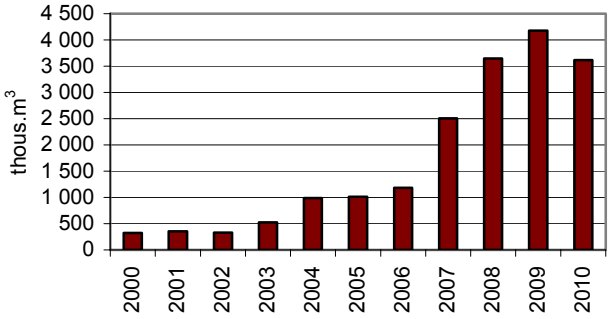
In 2010, 79.9% of damaged wood matter was thus processed, with 725.1 thous.m^3 still unprocessed. Defoliation of forest trees caused by **leaf-eating insects** was not recorded in 2010. Of the **pathogenic fungi,** the most frequent is *Armillaria* that causes most damage to the spruce tree type in the district of Čadca (271.7 thous. m^3).

Forest damage caused by biotic injurious agents (m^3, ha)

Phyto-pathogenic microorganisms	294.80 thous. m^3
Decays and tracheomycoses	31.12 thous. m^3
Leave-eating and sucking insects	0 ha
Bark beetles and woodworms	3 616.1 thous. m^3
Game	1 203 ha

Source: NFC, SO SR

Trend of damages caused by bark beetles and woodworms



Source: NFC

♦ Forest condition monitoring and assessments

National programme of **forest ecosystems health condition monitoring** was implemented also in 2010. The programme operated 112 permanent monitoring areas (PMA) within the 16x16 km network (extensive monitoring), and 7 research PMA (intensive monitoring). Both monitoring levels are part of the European network of monitoring areas, in which presently participate 39 European countries.

Compared to 2009, proportion of trees in 2-4 damage degrees for all tree types together grew by 6.5% **in 2010**. Proportion of coniferous trees in 2-4 damage degrees grew by 4.1% compared to the previous year, while the proportion of broad-leaf trees in the same degrees increased by 8.4%. Proportion of trees with defoliation beyond 50% is 2.4%.

Most damaged tree types included **oak**, **fir** and **spruce**. The **least damaged** were **hornbeam** and **beech**. Over the last years, the health condition indicated by defoliation and damage degree is stabilized, while the fluctuations between individual years are caused by climatic factors.

Results of forest condition monitoring in SR in 1987-2010

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
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
2008	Coniferous	3	55.9	39.7	1.4	0	97	41.1	1.4
	Broadleaves	15	64.2	20.0	0.8	0	85	20.8	0.8
	Total	10	60.7	28.2	1.1	0	90	29.3	1.1
2009	Coniferous	2.1	55.2	40.7	1.5	0.5	97.9	42.7	2.0
	Broadleaves	14.5	61.0	23.8	0.7	0	85.5	24.5	0.7
	Total	9.3	58.6	30.8	1.1	0.2	90.7	32.1	1.3
2010	Coniferous	6	48	44	2	0	94	46	2
	Broadleaves	12	55	32	1	0	88	33	1
	Total	10	52	37	1	0	90	38	1

Source: NFC

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, with defoliation greater than 25%.

Description of damage degrees of monitored trees:

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

Assessment of tree defoliation in selected European countries

Country	Number of assessed trees	Damage degree (%)				
		0	1	2	3+4	2+3+4
Czech Republic*	5 489	12.2	30.7	55.4	1.7	57.1
Hungary*	1 872	51.8	27.5	12.5	8.2	20.7
Poland*	9 160	23.8	56.1	19.4	0.8	20.2
Austria**	3 425	57.8	27.2	10.7	4.3	15.0
Slovakia	4 083	10.0	60.7	28.2	1.1	29.3
EÚ*	82 467	27.9	48.2	21.2	2.7	23.9

Source: NFC, FAO, 2008

Notes: * - data to 2007
** - data to 2006

♦ Nature protection and forest management

Forestation of the protected areas (PAs) is presently around **78%**, which testifies to the quality and level of conservation of forest habitats, as well as to the adequacy of recent approaches to their conservation. Human activities in most PAs are within the limits of the 2nd through 5th degree of protection, pursuant to Act on Nature and landscape protection. Forestry activities are totally inadmissible only within the strictest (5th) degree of protection.

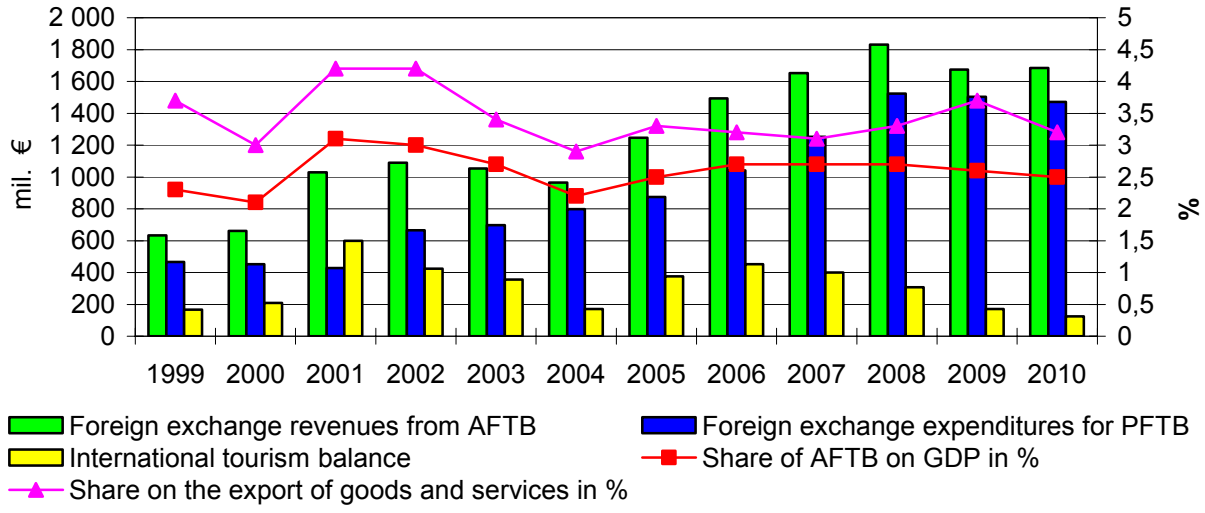
From the view of the area size, there is approximately **53% of forest land classified under the 2nd and higher nature protection degree** (or they are part of the protected area). Such size of protected areas with their related limitations **has an impact on the ownership rights** and **cause material losses.** Limitation to the common administration practices in private forests alone costs about 9.8 mil. EUR per year in total, according the Nature and landscape protection concept.

Recreation and Tourism

♦ Tourism and its contribution to the GDP

Foreign exchange revenues for active foreign tourism balance (AFTB) in 2000 - 2002 were increasing, notwithstanding the fluctuating characteristics of the statistical data. In 2002-2004 there was a reduction due to significant changes outside of the sector (the Slovak crown getting stronger especially in relation to the US dollar and the Polish zloty, an increase to the original GDP 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 goods and services in 2005 - 2008. On the contrary, in 2010, there was recorded a major reduction in revenues and tourism balance, while at the same time there was a significant increase in the **share of tourism on the GDP** and on the export of goods and services. In 2010, there was a very slight increase in revenues and a significant increase in tourism balance, while at the same time there was a slight reduction in the share of tourism on the GDP and a significant reduction in its share on the export of goods and services.

Tourism and the consolidated balance sheet of the State, share on the GDP and export in 2000 - 2010

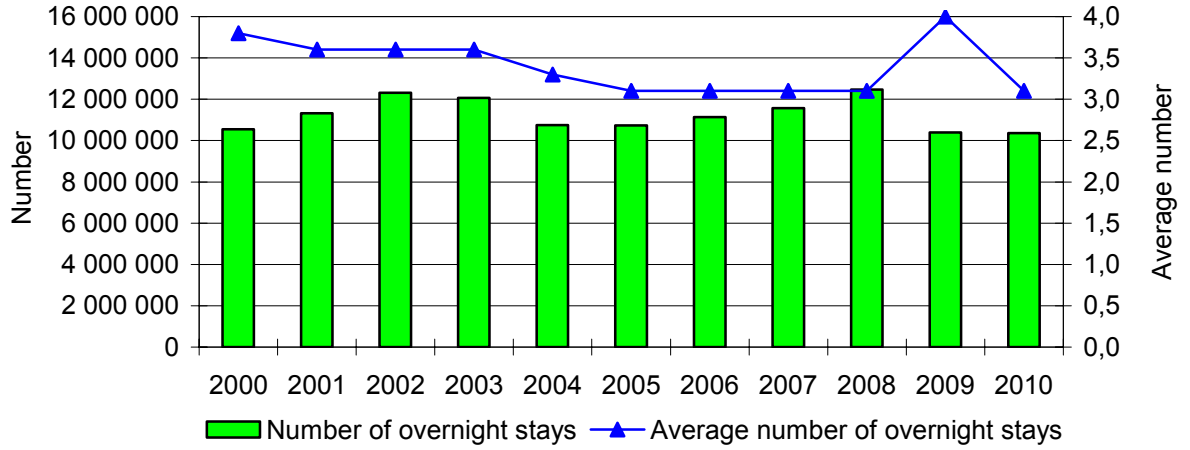


Source: SO SR

♦ Performance of accommodation facilities

Notwithstanding the significant fluctuation in statistical data, **the number of overnight stays is still stagnant**, with alternating periods of longer slight increments and short significant drops. Such significant reduction in the number of overnight stays (reduction by almost 17%) compared to a longer period of growth over the years 2005 - 2008, occurred in 2009. Most of all; however, the average number of overnight stays over the period of 1999 - 2008 was continually decreasing. On the contrary, in 2009 there was a major increase in the values of this indicator (increase by as much as 32%) as well as a major increase in the average number of overnight stays. In 2010, compared to 2009, there was a very slight reduction in the number of overnight stays and at the same time a very significant reduction in the average number of overnight stays by 22.5%.

Performance of accommodation facilities in the Slovak Republic in 2000 - 2010



Source: SO SR

♦ Environmental impact of recreation and tourism

Intensity of visitor stays is not uniformly distributed throughout the territory. The most attractive but also potentially endangered tourist destinations, mainly due to the influence of mountain tourism, include mainly national parks. Sites for the activities of mountain tourism are concentrated in the region of the Tatras National Park, Low Tatras National Park, and the Malá Fatra National Park. In terms of density of **marked biking trails and marked hiking trails,** the **most fragmented territories,** in consideration of their size, are areas of the **Pieninský National Park, NP Muránska Plane, and the NP Slovak Paradise**.

Continuing increase in the length of erosion-impacted hiking 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 the soil and the flora. **Critical soil erosion** can be seen at marked trails in the territory of the national parks of the **Low Tatras and Malá Fatra, and the Muránska Plane National Park. In 2004 - 2008, significant increase in erosion of marked hiking trails** was recorded also **in the territory of the Tatras National Park. On the contrary, a rather significant decline in the erosion of tourist marked trails in 2009 was recorded in the territory of the Pieninský National Park, and a slight decline appeared in the Veľká Fatra National Park.**

Highest **degree of endangerment** of small-size protected areas from tourism-related activities exists in the following territories: Tatras National Park, Low Tatras NP, NP Malá Fatra, Pieninský NP, NP Slovak Paradise, PLA Dunajské luhy /Danube marshes/, PLA Malé Karpaty /Small Carpathians/, PLA Strážovské hills, PLA Poľana, PLA Cerová hills, and PLA Vihorlat.

In terms of the categories of protected areas, **most assessed impacts** over the period of 2004 - 2007 **always related to the protective zones within national parks, as well as protected landscape areas and national parks. Open landscape shows the least number of assessed impacts.** In 2010, there was a significant decline in the number of assessed interventions to the most valuable territory under the 4th and 5th degrees of protection (NNR, NR, NNM, NM, and PA) and, on the contrary, major increase of interventions to the territories under the second degree of protection (national park protective zones, protected landscape areas).

• MATERIAL FLOWS AND WASTE

Key questions and key findings

♦ Key questions

- **Is the environmental pressure associated with material consumption decreasing in SR?**
- **Does the decoupling of environmental pressure from economic growth occur in SR? Do the material consumption curves for environmental load and economic efficacy diverge in Slovakia?**
- **Is the production of waste placed on the marked being reduced?**
- **Is the proportion of landfilled waste decreasing?**
- **Is Slovakia complying with the waste limits set forth by international criteria?**
- **Is packaging waste reclamation on a rise?**

♦ Key findings

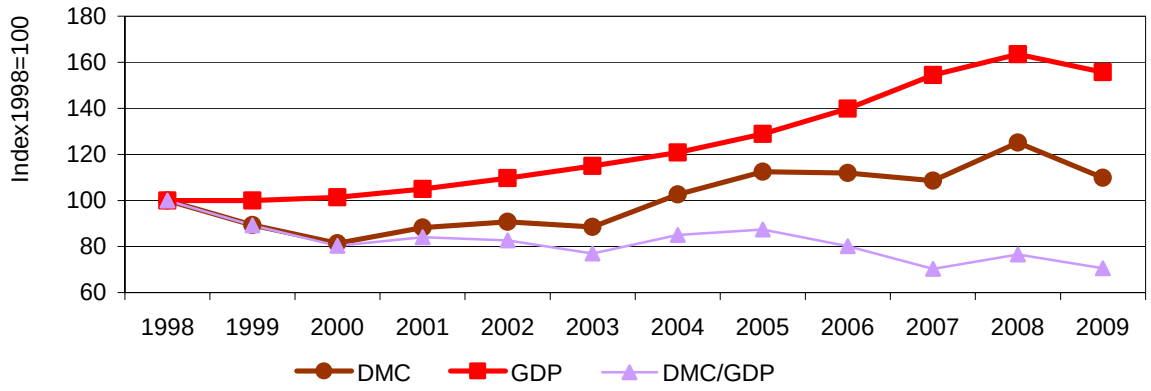
- **Domestic material consumption (DMC) in 2009, compared to 2008, dropped significantly (by 15.35%). Compared to 1998, DMC grew by 9.81 % in 2009. The trend copies the economic growth of Slovakia in 1998-2009, as well as the effects of the economic crisis in 2009. Slovakia's DMC is significantly below the EU 27 average.**
- **Share of export on DMC grew from 39% in 1998 to 52% in 2009, which substantially increased Slovakia´s material dependence on the international markets.**
- **Decreasing material intensity (reduction in DMC/GDP at comparing the years of 1998 and 2009 by 37%) is a positive trend that indicates a growing effectiveness in the change of the input material flows toward economic output due to introducing modern technologies, increasing rate of recycling, as well as reducing the environmental pressure per unit of GDP.**
- **When compared with 2009, waste introduced on the market in Slovakia grew by app. 21% in 2010. From a long-term perspective (comparison with the year 2005, which was the reference year for the creation of the waste management plan) there was a slight decrease by 1.7% as of 2010. Positive aspects of 2010 include the growing proportion of recovered waste, compared to 2009.**
- **Following a slight reduction in the volumes of generated municipal waste in 2009, there was again an increase in 2010 (by 8 kg per capita). Compared to 2005, its production grew by approximately 14%. When compared with the EU countries, generation of the municipal waste per capita is low, still below the average EU 27 value. 24.8 kg of municipal waste per capita has been separated.**
- **There has been a long and negative high share of waste landfilling on total waste disposal (almost 80% for waste other than municipal, and 81.4% for municipal waste)**
- **In 2010, 4 kg per capita of waste electrical and electronic equipment was collected in 2010. Slovakia reached the limit of 4 kg/capita set by the EC.**
- **Slovakia reached the proportion for re-utilisation, recycling, and reclamation of old vehicle parts as defined by the EC Directive and thus fulfilled the set limit.**
- **Of total volumes of generated packaging waste in 2010, 59.8% of waste was recycled, and 63.2 % was recovered. Thus, Slovakia complied with the set limits.**

Material flows

Trend in DMC for the years 1998 through 2009 showed fluctuating characteristics. After the initial decline until 2000 which was 25.6%, there was an increase in DMC from the year 2000 by 29.1%, with the climax in 2005. Subsequently, it showed a stabilisation and even a slight reduction (by 4 % until 2007). Later, it grew by 16.6% by 2008. In 2009, there was a reduction by 15.35%, compared to the previous year. In view of the effective use of natural resources, this trend is perceived as positive due

to the fact that the trend in the direct material consumption expressed as the sum of imported materials, extracted minerals, and collected biomass from the Slovak territory after deducting the exported materials, does not show any significant increase, given the present economic growth. Share of import on DMC is also an important indicator. The bigger the share, the more sensitive the country's economy to spontaneous fluctuations in international trade (lack of certain commodities, unexpected increase in their prices, etc.). Share of export on DMC grew from 39% in 1998 to 52% in 2009, which means increasing Slovakia's material dependence on the import of raw commodities. Over the whole monitored period there was a reduction in the material demand expressed through the DMC/GDP, by 37%. The reduction was recorded in the following intervals: 1998–2000, 2001–2003, and 2005 through 2007. During the first monitored period (1997-2000), reduction was mainly caused by the decreasing DMC indicator and less by the economic growth; since 2001, material demand dropped also due to a strong economic growth. In 2009, there was a reduction by 6%, compared to 2008, due to both decreased economic growth caused by the economic crisis, as well as by a decreased DMC.

Waste generation (t)



Source: SEA, SO SR

Waste and Waste Management

♦ Balance of waste generation

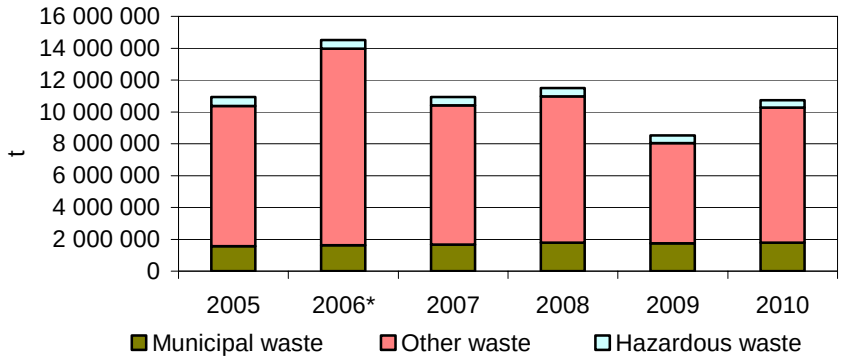
When compared with 2009, growth in waste introduced on the market shows app. 21%. When further compared with 10.9 mil. tonnes of waste produced in 2005, their generation dropped by 1.7%. In 2010, waste originators submitted to waste handling authorities slightly lower volumes of hazardous and municipal waste for recovery and disposal than in 2009. However, the other waste showed major growth in its location on the market, which, compared to 2009, is an increase in the category of other waste located on the market by app. 26%.

Waste generation (t)

Waste category	Amount (t)
Hazardous waste	466 421.51
Other waste	8 480 611.66
Municipal waste*	1 796 159.86
Total	**10 743 193.04**

Source: SEA, SO SR

Waste generation (t)



Source: SEA, SO SR

**Growth in the generation of other waste types in 2006 by app. 40% compared to 2005 and 2007, was caused especially by the growth in generated construction waste, specifically in the category of excavation soil generated at the construction of highway exits, the Sitina tunnel in Bratislava, and single declaration of dross volumes produced at U.S. Steel Košice.*

Compared to 2009, the annual growth of waste put on the market is about 21%. The decrease existed in hazardous waste generation by 1.5% compared to the previous year.

In the area of waste generation by economic activities classification SK NACE, manufacturing industry has been the dominating component over the recent years, with 30% share. Sector of building industry and sector Water supply; sewerage; waste management and remediation activities follow with 20%, It is necessary to point out that the total amount of waste produced by particular economic sectors does not include municipal waste.

Waste generation by particular economic sectors in year 2010 (t)

SECTION	Total (t)	Hazardous waste (t)	Other waste (t)
A - Agriculture, Forestry, Fishery	525 604.85	9 274.41	516 330.44
B - Mining and quarrying	165 584.61	384.03	165 200.58
C - Manufacturing	2 711 540.61	219 011.92	2 492 528.69
D - Electricity, gas, steam and air conditioning supply	877 644.33	5 358.07	872 286.26
E - Water supply; sewerage; waste management and remediation activities	1 831 010.13	45 395.44	1 785 614.69
F - Construction	1 786 429.38	45 711.68	1 740 717.69
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	527 594.31	44 488.37	483 105.94
H - Transporting and storage	120 728.63	33 492.46	87 236.17
I - Accommodation and food service activities	26 259.54	84.28	26 175.26
J - Information and communication	3 647.70	368.00	3 279.70
K - Financial and insurance activities	409.53	119.37	290.16
L - Real estate activities	15 552.23	3 508.17	12 044.06
M - Professional, scientific and technical activities	68 018.71	5 487.10	62 531.61
N - Administrative and support service activities	15 302.05	945.76	14 356.29
O - Public administration and defence; compulsory social security	19 612.53	1 089.05	18 523.47
P - Education	997.97	121.07	876.90
Q - Human health and social work activities	127 976.60	17 484.68	110 491.92
R - Arts, entertainment and recreation	219.75	34.38	185.37
S – Other services activities	1 485.40	183.01	1 302.39
Unknown	121 414.32	33 880.26	87 534.06
Total	**8 947 033.18**	**466 421.51**	**8 480 611.66**

Source: SEA

♦ Waste handling

Waste recovery

There were 5 558 179.57 **tons of waste recovered** in the SR in 2010. This represents **62% of total volume of waste** located on the market (not included MW). R5 activity – Recycling or re-extraction of other inorganic compounds has the greatest share on waste recovery with a 24% share.

Waste recovery following codes R1 – R13 in year 2010 (t)

Code	Activity	Total (t)	Hazardous waste (t)	Other waste (t)
R1	Used mainly as fuel or to extract energy through different approach	84 151.75	4 013.19	80 138.56
R2	Solvent reclamation/regeneration	1 450.17	1 262.46	187.71
R3	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes)	578 542.11	1 430.38	577 111.73
R4	Recycling or reclamation of metals and metal compounds	1 170 742.32	9 551.92	1 161 190.40
R5	Recycling or reclamation of other inorganic material	1 331 193.62	2 095.80	1 329 097.83
R6	Regeneration of acids and bases	537.39	523.64	13.76
R7	Recovery of components used for pollution abatement	545.70	235.01	310.69
R8	Recovery of components from catalysers	2 283.29	2 281.58	1.71
R9	Oil re-refining or other re-uses of soil	10 766.70	10 625.60	141.11
R10	Treatment of soil to benefit the agricultural production or to improve environment	848 477.03	201.67	848 275.36
R11	Use of waste obtained from the activities R1 to R10	108 639.22	220.02	108 419.20
R12	Treatment of waste generated by any of the R1 to R11 activities	641 471.89	62 288.11	579 183.78
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)	779 378.38	38 438.95	740 939.43
Total		**5 558 179.57**	**133 168.33**	**5 425 011.26**

Source: SEA

Waste disposal

Of total volumes of generated waste placed on the market 3 003 601 t, **33% was disposed** (without MW)**.** Dominance of landfill waste is a historical rule with 80% share on total waste disposal, what means the decresing about 273 000 tonns compared to previous year (without MW). As of December 31, 2010, there were 118 landfills operated in Slovakia.

Number of landfills (towards 31.12.2010)

Region	Hazardous waste landfills	Landfills for not hazardous waste	Inert waste landfills	Total
Bratislava	2	8	2	**12**
Trnava	1	8	2	**11**
Trenčín	3	11	1	**15**
Nitra	3	12	2	**17**
Žilina	2	14	0	**16**
Banská Bystrica	2	13	1	**16**
Prešov	1	14	1	**16**
Košice	3	9	3	**15**
Total	**17**	**89**	**12**	**118**

Source: SEA

Waste disposal following codes D1 – D15 in year 2010 (t)

Code	Activity	Total (t)	Hazardous waste (t)	Other waste (t)
D1	Underground or surface waste disposal. (e.g. landfill)	2 397 240.85	96 065.69	2 301 175.16
D2	Treatment by soil processes (e.g. biodegradation of liquid or sludge waste in soil, etc.)	89 964.50	48 075.88	41 888.62
D8	Biological treatment non-specified in this annex that generates compounds and mixtures eliminated by any of the D1 to D12 activities	190 635.85	54 128.28	136 507.57
D09	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, etc.)	145 964.65	74 155.22	71 809.43
D10	Incineration on land	96 448.91	43 467.57	52 981.34
D13	Mixing or blending prior to any of the D1 to D12 activities	14 348.77	35.19	14 313.58
D14	Placing into other packaging prior to any of the D1 to D12 activities	295.54	209.00	86.54
D15	Storage before implementing any of the D1 to D14 activities (besides temporary storage prior to collection at the place of waste generation)	68 702.06	14 815.40	53 886.65
Total		**3 003 601.11**	**330 952.23**	**2 672 648.89**

Source: SEA

Other waste handling

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

Disposal code	Activity	Total (t)	Hazardous (t)	Others (t)
DO	Handing over of waste for domestic use	134 760.94	0	134 760.94
Z	Storage of waste	250 491.53	2 300.95	248 190.58
Total		**385 252.47**	**2 300.95**	**382 951.52**

Source: SEA

♦ Waste from electrical and electronic equipment (WEEE)

There were placed on he market 60 661 of electrical devices in Slovakia in 2008 (11 kg per habitant). Amount of collected WEEE was approx. 19 388 thousand tons (3.6 kg per habitant).

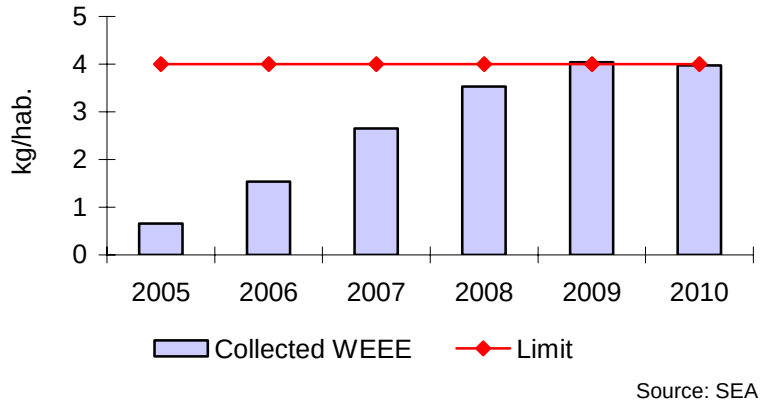
Summary reports by producers of electrical equipment for the year 2010 (kg)

	Introduced to market (kg)	Collected (kg)	Processed (kg)	Recovered (kg)	Recycled (kg)
1. Big domestic appliances	25 203 885.90	12 325 432.95	12 558 526.35	10 992 620.91	10 946 172.39
2. Small domestic appliances	4 766 517.21	1 745 201.95	1 722 761.95	1 467 739.27	1 431 998.99
3. IT and telecommunication devices	5 517 766.61	3 243 785.16	3 243 785.16	2 923 569.40	2 874 983.40
4. Consumer electronic devices	6 071 630.53	2 544 873.37	2 544 873.37	2 275 126.32	2 205 796.57
5. Sources of light	3 237 934.81	1 150 278.70	1 150 278.70	907 383.22	862 505.78
6. Electrical and electronic instruments	3 569 482.57	548 834.00	566 643.00	478 926.92	458 975.51
7. Toys. devices designated for sport and recreational use	522 378.84	30 793.11	30 793.11	26 754.91	25 653.93
8. Medical devices	144 186.54	126 804.00	123 939.00	105 472.60	104 272.49
9. Machines for monitoring and testing	134 002.31	117 740.50	126 792.50	111 390.58	100 818.84
10. Vending machines	84 025.00	82 525.00	84 236.00	78 959.33	77 757.44
Total	**49 251 810.32**	**21 916 268.74**	**22 067 000.14**	**19 300 683.46**	**19 015 615.34**

Source: SEA

The EP and Council Directive 2002/96/EC on waste electrical and electronic equipment (WEEE) sets a unified limit for the collection of electrical household waste to 4 kg/capita. In 2010, 4 kg/capita was collected. Slovakia met this limit in 2010.

Trend in the collection of electrical household waste (kg/hab)



Source: SEA

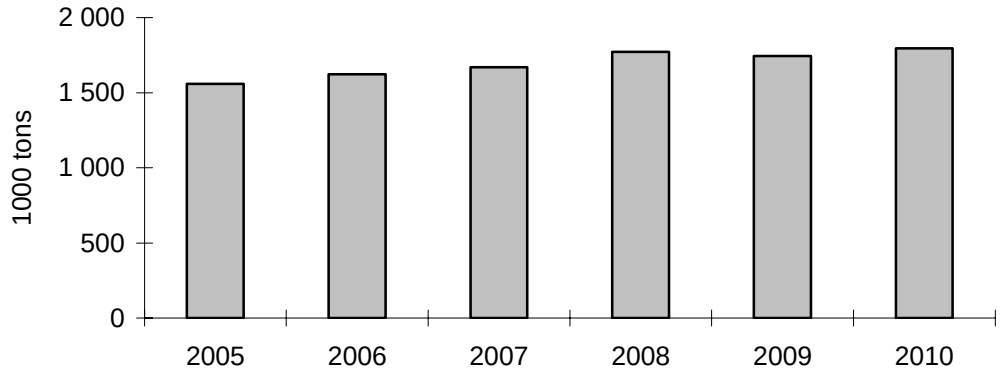
♦ Old vehicle

When compared with 2009, there was a significant reduction (about 48%) in the number of handled old vehicles. This might have been caused also by the stopped funding of old vehicle disposal activities at the purchase of new vehicles, the so-called "scrap allowance".

♦ Municipal waste

According to data from the SO SR, there were 1 796 159.86 tons of total municipal waste generated in Slovakia in 2010. This volume represents 330 kg of municipal waste per capita. Compared to 2009, this is an increase by 9 kg per capita. Long-term waste disposal on landfills (81.4%) is the most frequent method of municipal waste handling, following by incineration with energy recovery (6%).

Municipal waste generation (1000 tons)



Source: SO SR

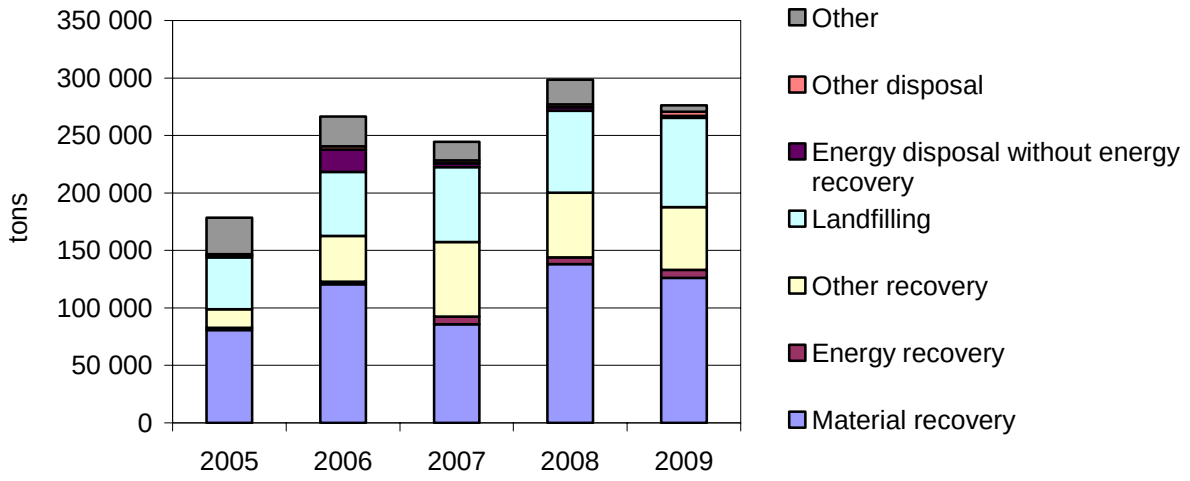
In terms of municipal waste composition, mixed municipal waste (67.27%) constitutes the major component of municipal waste together with bulky waste (11.59%), small construction waste (4.98%). Biologically degradable waste was 4.67% and waste paper and cardboard was 2.68% and glass 2.37%.

From 1.1.2010, the municipalities are obliged to introduce separated collection of four municipal waste categories: paper, plastic, glass, and metals. According to the SO SR, volume of separated municipal waste per capita is 24.8 kg.

♦ Packaging and waste from packaging

Total volumes of packaging waste show rising characteristics. The number of recovered packaging waste material grew from 45.21% in 2005 to 46.22% in 2008; in 2009 there was an increase by 4.2% compared to 2008. Reduction in the volumes of landfilled packaging waste is only very slight, by 1.37%.

Trend in packaging waste generation and disposal (tons)



Source: SEA

♦ Financial mechanism of waste management

Recycling Fund

Total financial revenues in 2010 were almost 13.61 mil. EUR, which is 570 000 EUR less than in 2009. Recycling Fund in 2010 approved 1 862 applications for funding submitted by municipalities and businesses. Successful applicants received 12.87 mil. EUR from the fund. This number includes 1 486 approved applications submitted by municipalities for separated waste financial contribution. In 2010, more than 2.45 mil. EUR was approved for this purpose.

Environmental fund

Description of released subsidies and loans in 2010 is provided in the chapter on Environmental economics.

♦ Transboundary movement

Over the period of 1.1.2010 to 31.12.2010, the MoE SR issued **175 licences regarding the transboundary transport of waste** that permitted the shipment of waste types classified under Annex III (Green Register of Waste), Annex IV (Yellow Register of Waste), Annex V, part 1, register A of the European Parliament and of the Council (EC) Directive no. 1013/2006 on waste shipment. In some cases, the licences mentioned waste categories impossible to be classified under the Regulation's annexes (unclassified waste under none of the Regulation's annexes). In total, **1 619 875 tonnes of waste** were permitted to be imported into Slovakia. In 2010, **701 141.30 tonnes of waste** was permitted for **export.** On the basis of licences issued by the MoE SR for **transit shipment** in 2010, **62 943.50 tonnes of waste** was licensed for transit through the Slovak territory.

• CLIMATE CHANGES

Key questions and key findings

♦ Key questions

- **What is the trend in the greenhouse gases emissions intensity - i.e. measurable greenhouse gases emissions per capita, or per GDP unit in the Slovakia?**
- **Does Slovakia fulfil the obligations it assumed from the valid approved documents dealing with climate protection?**
- **What is the observable impact of climate change on the Slovak territory?**

♦ Key findings

- **Trend in the development of total emissions suggests that measured greenhouse gases emissions have been decreasing. In terms of international comparisons, Slovakia shows values that are below the EU-27 average.**
- **Greenhouse gases emissions over a longer time horizon has been permanently dropping. (when the figures for 2009 are compared to 1990, there was a 41% reduction) However, it must be said that during the years 1996-2008, emissions showed roughly the same values. There was a more significant year-to-year reduction shown in 2009, attributed mainly to the emerging impacts of the economic crisis. Slovakia has been fulfilling its relevant international obligations (The Kyoto Protocol, the EU climate and energy package) and is expected to maintain the same course.**
- **In terms of comparison over a longer time horizon (since 1981) Slovakia has shown a growth in the average annual temperature, decline in the annual rainfall totals (with the exception of 2010 which was exceptionally humid), reduction in relative humidity and soil humidity, and substantially increased variability in weather patterns with relatively extended drought periods on the one hand, and extremely intensive flooding rainfalls on the other hand.**

Greenhouse gases emissions

Total greenhouse gases emissions in Slovakia in 2009 represented 43 426.07 Gg CO_2 (excluding the LULUCF sector). This meant a reduction by 41.44%, compared to the reference year of 1990. Compared to the previous inventory year of 2008, greenhouse gases emissions dropped significantly, by about 10%. Reduction in greenhouse gases emissions in 2009 has been mostly caused by the impacts of the financial market crisis and the subsequent economic recession. Impacted were mainly the sectors of power industry (industrial power management), and industry. Other sectors such as agriculture, waste, or forests have not shown significant reduction and in general show more stable trend characteristics. As anticipated, emissions in the area of transport, especially road transport and industrial emissions of fluorinated gases (F-gases) that substitute freons prohibited by the Montreal Protocol (mainly HFCs and SF_6). Total greenhouse gases emissions with calculated sinks in the sector of landscape use and forest management (LULUCF) in 2009 were 39 977.06 Gg CO_2 equivalents (the sinks represented 3 449.01 Gg CO_2).

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 2009, CO_2 emissions contributed by 80.8%, CH_4 (GWP = 21) were maintained at the level of 10%,

N_2O emissions (GWP = 310) contributed by 8.4%, and F-gases (HFC, PFC, and SF_6) contributed by 0.8%.

Within the share of individual sectors in 2009, power industry including transport reached with the share of 66.1%, with transport representing 21.6%. Industrial processes including solvents had the share of 21.9% on total greenhouse gases emissions. Agriculture represented 7%-share on emissions while waste contributed with 5% to total emissions.

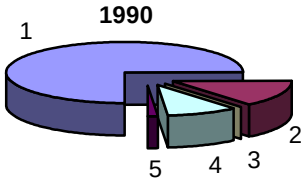
In relation to the requirements set forth by the UN Framework Convention on Climate Change (UNFCCC) and contained also in the Kyoto Protocol (KP), emission assessments for greenhouse gases emissions and reports sent to the UNFCCC office are subject to yearly evaluations. Slovakia reflected on the objections voiced by the office in 2010 and re-calculated the controversial categories such as road transport, assessments of emissions in industry (production of steel and iron), and assessment in the area of forests management.

Aggregated emissions of greenhouse gases (Tg) in CO_2 equivalents

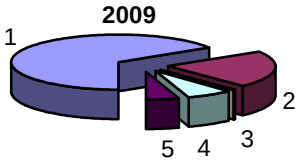
Year	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Net CO_2	59.78	38.06	36.07	34.31	36.33	36.85	40.05	36.63	35.02	35.90	31.61
CO_2*	62.77	41.18	42.38	40.83	42.17	41.97	41.50	40.77	39.00	39.10	35.09
CH_4	4.81	4.44	4.49	5.05	4.88	4.79	4.59	4.66	4.55	4.69	4.35
N_2O	6.31	3.51	3.64	3.77	3.79	3.83	3.81	4.19	4.04	4.08	3.65
HFCs	NA,NO	0.08	0.08	0.10	0.13	0.15	0.17	0.20	0.23	0.26	0.30
PFCs	0.27	0.01	0.02	0.01	0.02	0.02	0.02	0.04	0.02	0.04	0.02
SF_6	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Total (with net CO_2)	71.20	46.16	44.33	43.28	45.20	45.67	48.68	45.76	43.90	45.01	39.98
Total*	74.15	49.24	50.62	49.78	51.01	50.78	50.11	49.89	47.86	48.19	43.43

Emission were assessed by 15.04.2011 Source: SHMI
The table shows calculated years 1990-2008
** Emissions without deducting the sinks in the sector of LULUCF (Land use-Land use change and forestry)*
NA = no applicable, NO = no occurrence

Share of individual sources on greenhouse gases emissions



1990		2009
74.6%	1. Power Industry	66.1%
14.2%	2. Industry Processes	21.6%
0.02%	3. Using solvents	0.4%
9.5%	4. Agriculture	7.0%
1.5%	5. Waste	5.0%



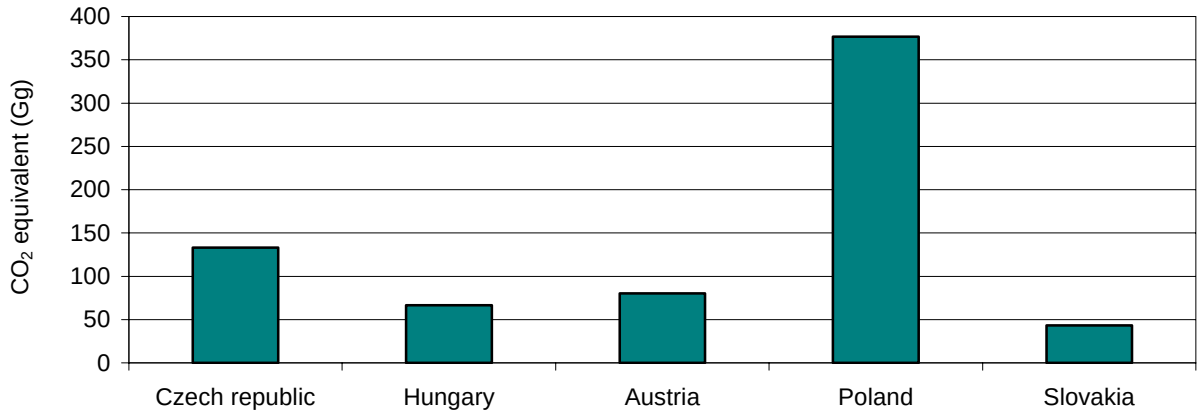
Emission were assessed by 15.04.2011 Source: SHMI

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

	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Power Industry*	55.32	34.05	35.17	33.07	34.52	33.43	33.16	32.39	30.60	31.32	28.69
Industry Processes**	10.53	9.88	10.09	10.47	10.47	11.50	11.23	11.64	11.47	11.18	9.39
Using solvents	0.14	0.09	0.10	0.13	0.13	0.16	0.17	0.17	0.17	0.17	0.16
Agriculture	7.06	3.44	3.45	3.53	3.39	3.22	3.21	3.16	3.28	3.15	3.02
LULUCF	-2.95	-3.07	-6.29	-6.51	-5.81	-5.10	-1.43	-4.13	-3.96	-3.18	-3.45
Waste	1.09	1.77	1.81	2.58	2.50	2.46	2.34	2.53	2.36	2.37	2.16

Emission were assessed by 15.04.2011 Source: SHMI
The table shows calculated years 1990-2008
** Including the traffic ** Including the F-gases*

Comparison in GHGs emissions in selected countries - in 2009



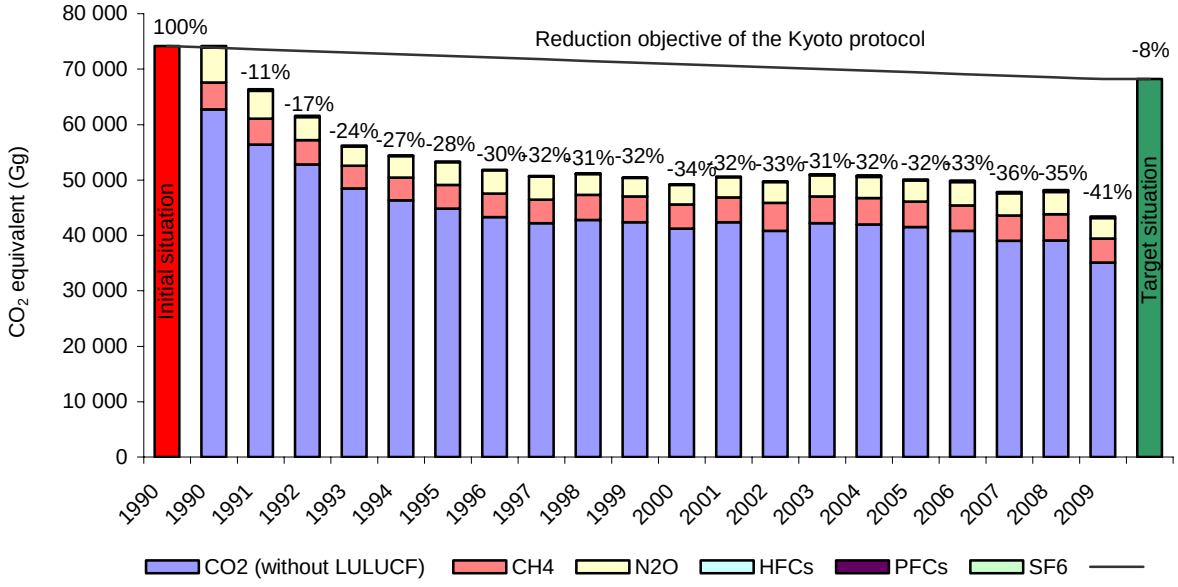
Source: Eurostat

Consequences of climate change

In Slovakia, over the period 1881-2009, there was recorded an increasing trend in the average annual air temperature by 1.6°C and reduction in annual precipitation balance by 3.4% (south of Slovakia showed a reduction by more than 10%, while the north and north-east locations showed a sporadic increase of up to 3% over the whole monitored period). There was also a significant reduction in air humidity (up to 5%) and a reduction to the snow cap for almost the whole Slovak territory (slight increase in upper mountain regions) 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). There has been a significant increase in weather variability, especially rainfall totals.

Over the last 15 years, there was a significant increase in the occurrence of extreme daily precipitation figures, which consequently produced an increased risk in local floods in various regions of Slovakia. On the other hand, during 1989-2009, much more often than before there would occur a large-territory drought, which was caused mostly by prolonged periods of relatively warm weather with little rainfall totals in a particular part of the vegetation period. Especially harmful were droughts in the periods of 1990-1994, 2000, 2002, 2003, and 2007. The decades of 1991-2000 and 2001-2009 with their air characteristics, rainfall totals, evapo-transpiration, snow cap, as well as other elements, approached the anticipated conditions for 2030 in the area of climate change scenarios for Slovakia. Exceptional values have been recorded for rainfall totals over the cold semester and the winter season of 1991-2000. Also, the year 2010 was characterised as exceptionally humid, with extreme rainfalls, especially in the months of May through September.

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



Source: SHMI

• PUBLIC HEALTH

Key questions and key findings

♦ **Key questions**

- **What is the trend in the basic indicators relevant to the demographic trend and the level of public health?**

♦ **Key findings**

- **The average life expectancy in Slovakia has been on a permanent rise. In 2010, when compared with 2000, it grew by 2.47 years in men, and 1.61 years in women.**
- **Number of live births per 1 000 inhabitants grew from the level of 10.2 in 2000 to 11.1 in 2010.**
- **Number of deaths per 1 000 inhabitants dropped from the level of 9.9 in 2000 to 9.8 in 2010.**

Morbidity and mortality

Average life expectancy at birth is rising for both genders, reaching 71.67 years for men and 78.84 years for women in 2010. 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. **Structure of population** by gender is the result of natality, mortality, and external migration. The secondary masculinity index, i.e. the number of born boys per 1 000 born girls, shows generally fluctuating characteristics. The most positive element in the demographic trend of 2009 was a relatively substantial increase in the number of live births, reaching the level shown in 1995.

In 2010, there were 27 645 deaths for men and 25 800 deaths for women. Compared to 2009, this is higher by 199 deaths in men, and higher by 333 deaths in women. In 2010, 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 in 2010, with 28 541 deaths, which is 46.5% in men and 60.8% in women. Second most frequent cause of death for both, men and women, are still neoplasms. Compared to the last year, cancer shows a slightly increasing tendency, with 12 185 deaths in 2010, which is 25.6% of men and 19.8% of women. For men, third most frequent cause of death is external causes (8.3%). For women, third most frequent cause of death are other diseases, (7.0%).

Public Health – selected indicators

Indicator	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Life expectancy at birth										
• Men	69.51	69.77	69.77	70.29	70.11	70.40	70.51	70.85	71.27	71.62
• Women	77.54	77.57	77.62	77.80	77.90	78.20	78.08	78.73	78.74	78.84
Live births per 1 000 inhab.	9.5	9.5	9.6	10.0	10.1	10.0	10.1	10.6	11.3	11.1
Deaths within 1 year of age per 1 000 live births	6.2	7.6	7.8	6.8	7.2	6.6	6.1	5.9	5.7	5.7
Infant mortality rates	4.1	4.7	4.5	3.9	4.1	3.5	3.4	3.4	3.1	3.6
Deaths	51 980	51 532	52 230	51 852	53 475	53 301	53 856	53 164	52 913	53 445
Deaths per 1 000 inhab.	9.7	9.6	9.7	9.6	9.9	9. 9	10.0	9.8	9.8	9.8

Source: SO SR

ENVIRONMENTAL RISK FACTORS

• PHYSICAL RISK FACTORS

Key questions and key findings

♦ **Key questions**

- **How significant is the load effecting the population due to the contents of artificial radionuclide agents in the food chain components?**
- **Is the operation of nuclear power plants in Slovakia safe?**

♦ **Key findings**

- **Contents of artificial radionuclide agents in the basic food groups and forage types was at the detection limit and their contribution to radiation load on the public resulting from their potential ingestion is insignificant.**
- **Number and character of events in individual nuclear facilities in 2010 showed that their operation is reliable, safe, and free of major faults.**

Radiation protection

Environmental radioactivity monitoring was carried out in compliance with the MoE SR Act 355/2007 Coll. on protection, promotion and development of public health, and pursuant to the MoE SR Resolution 524/2007 Coll. which sets forth details regarding the radiation monitoring network.

Public Health Authority of the Slovak Republic carries out radiation situation monitoring and collection of data in Slovakia for the purposes of irradiation assessment and assessment of the effects of radiation on the health of the population.

In 2010, total number of 413 samples from the environment was extracted and 1 363 radiochemical analyses were conducted, along with 5 616 radiometric measurements.

Basic radiological indicators within the **drinking water** samples extracted under the environmental monitoring scheme did not exceed the benchmark values for implementation of measures. ^{90}Sr volume activities were lower than 0.01 Bq/l and less than 0.02 Bq/l for ^{137}Cs.

Surface and waste water showed the maximum activity of 0.03 Bq/l for ^{90}Sr, and 0.05 Bq/l for ^{137}Cs.

Volume activities of tritium within drinking water samples and atmospheric precipitations stayed at the MDA level (minimum detectable activity) (2.0 Bq/l), and in the interval of up to < MDA - 86.0 Bq/l for surface water. Highest detected activities for tritium were in waste water from EBO and EMO, ranging between 30.0 and 4 670.0 Bq/l. The highest detected value was 7 916 ±.14 Bq/l (EMO waste water - May) No exceeded values for the concentration limit $1.95.10^5$ Bq/l were detected in tritium discharged into the environment.

^{90}Sr activities within the **atmospheric fallout** sampled ranged from < 0.33 (MDA) - 0.90 Bq/m^2 and for ^{137}Cs within 0.7 – 3.50 Bq/m^2.

^{90}Sr content within the **arable land** ranged from 0.60 - 1.3 Bq/kg, and for ^{137}Cs from 1.60 to 22.00 Bq/kg.

Outcomes from the monitoring of individual **food chain components** and **agricultural products** in 2010 suggest that the content of artificial radionuclide agents of ^{137}Cs and ^{90}Sr within the basic food categories and forage types was at the detectable level and their contribution to the radiation load on the public from their potential ingestion is insignificant.

Comparison of the outcomes of monitoring of milk, agricultural products, and arable land obtained in the vicinity of the nuclear power plants of Jaslovské Bohunice and Mochovce, as well as at other sites in Slovakia, did not show a significant difference in their radioactive contamination.

Activity of nuclear installation

In Slovakia in 2010, there were altogether 4 operated blocks of nuclear power plants (NPP) with nuclear reactors of the VVER-440 type. Two of them were in Mochovce, and the other two in Bohunice. Still, other two blocks of AE Bohunice V-1 are in phase-out stage before their final elimination.

List of nuclear installation in the SR and their operators

Location	Nuclear installations	Operator
Mochovce	NPP Mochovce, 1st and 2nd. block NPP Mochovce 3rd and 4th block under construction	**SE, Inc.**
Bohunice	NPP V-2 , 3rd and 4th block	
Bohunice	NPP Bohunice V-1 NPP Bohunice A-1 Repository of Spent Nuclear Fuel (SNF) Technologies of treatment and processing RAW	**JAVYS, Inc.**
Mochovce	Final treatment of liquid RAW Republic deposit RAW	

Source: NRA SR

NPP V-1 Bohunice

First block of NPP Bohunice V-1 was put out of operation in December 2006, and in February 2009 the block was switched into regime 8, meaning that the fuel from the reactor was transported out to the Temporary spent fuel storage (MSVP). Reactor and the primary circuit is assembled and filled with pure condensate.

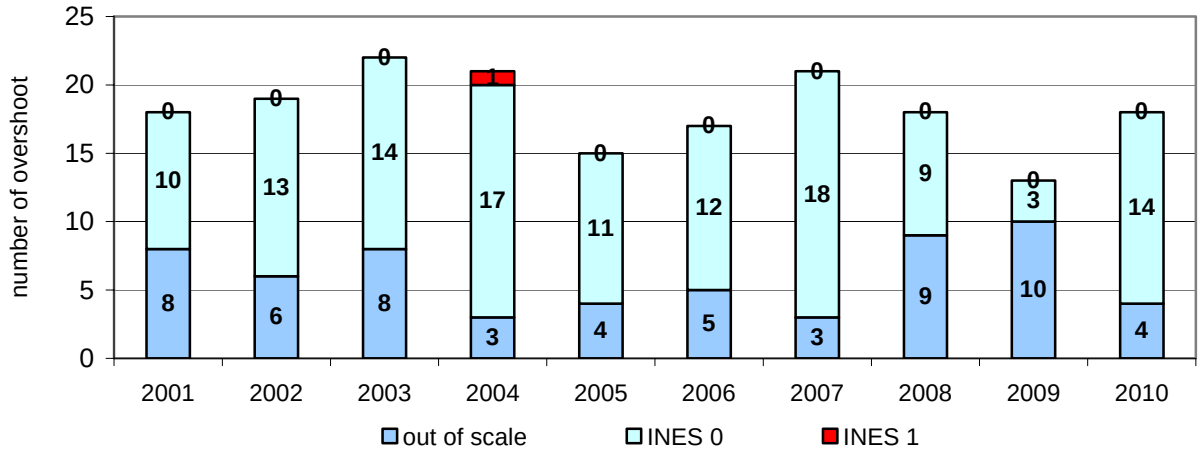
Second V-1 block put out of operation in 2008 was put in mode no. 7, i.e. fuel from the reactor was transported out to the storage pool next to the reactor, and 300 fuel assemblies were stored at the MSVP. Toward the end of 2010, there were still 13 pcs of spent fuel assemblies found inside the pool. Reactor and the primary circuit is assembled and filled with pure condensate.

Works performed during the year focused on reaching compliance with the criteria for obtaining the license for the 1st elimination phase. These included mainly the gradual taking out of the spent nuclear fuel to the MSVP, and processing the stored RAW originating from the operation of nuclear facilities.

NPP V - 2 Bohunice

Since 2010, both V-2 blocks have been operated at an increase reactor heat output of 1 471 MW, which represents an increase by 7%, compared to the original projected output. At the same time, electric output also increased up to 500 MW. The number and character of events and occurrences in 2010 was within the realm of common technological malfunctions, without a unique safety issue. Based on the outcomes of the NRA SR control and assessment activities, the operation of NPP was assessed as reliable in 2010, with no major failures in the area of nuclear safety.

Number of occurances of block NPP V-2 Bohunice

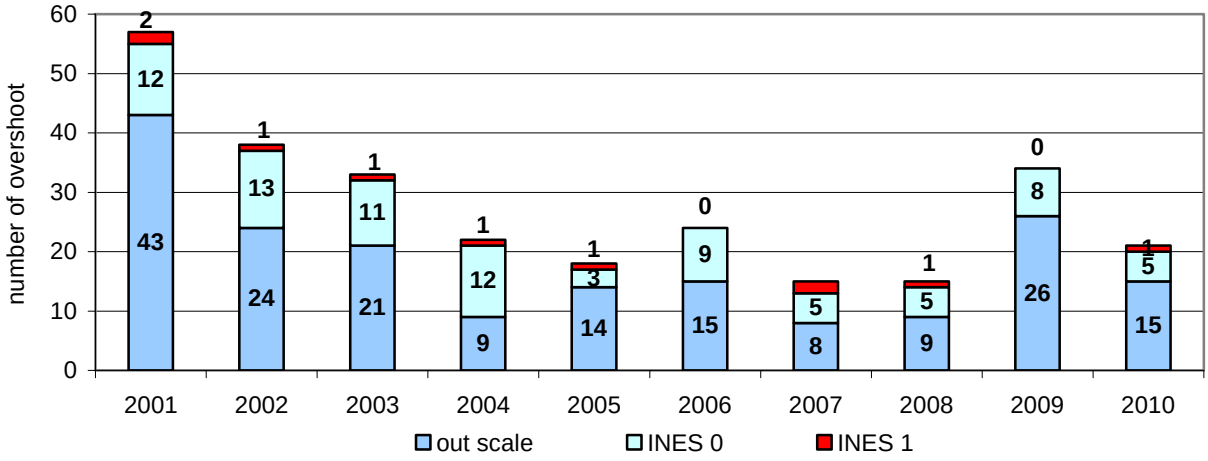


Source: NRA SR

NPP Mochovce 1,2

The Mochovce NPP comprises two blocks with the VVER 440 reactor type. The 1st and 2nd blocks of this NPP worked reliably during the year at an increased heat output of 107%. The number and character of events and occurrences in 2010 was within the realm of common technological malfunctions, without a unique safety issue. Events that occurred at NPP Mochovce 1, 2 did not have a major impact on nuclear safety. Based on the outcomes of the NRA SR control and assessment activities, the operation of NPP Mochovce 2 was assessed as safe in 2010.

Number of occurances of block NPP Mochovce 1, 2



Source: NRA SR

Interim Spent Nuclear Fuel Storage of Jaslovské Bohunice

serves to temporary store spent fuel from the EBO V-1 and EBO V-2 NPPs before it is transported to a reprocessing facility, or permanently disposed of at a repository. In 2010 during the operation there was no case of non-compliance with the conditions of nuclear and radiation safety and operation directions; hence, the operation may be assessed as safe and reliable.

Technology of processing and treatment of radioactive atomic waste (RAW)

is operated by the JAVYS, Inc. This installation includes two bitumen lines, cement line, and the Bohunice RAW Treatment Centre. Outcomes of the control activities suggest that the operation of NI Technologies for radioactive waste processing and treatment may be assessed as safe.

National Radioactive Waste Repository Mochovce (NRWR)

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. JAVYS, Inc. is the operating company.

Inspection activities at the NRWR in 2010 focused on the process of receiving the radioactive waste to the repository, and on controlling of the properties of fibre-reinforced concrete containers by the site operator. Based on the outcomes of control activities, operation of the National Radioactive Waste Repository in Mochovce may be assessed as safe, without a negative impact on environment.

Liquid RAW Final Treatment Facility (LRW FTF) in 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.

Inspection activity focused on controlling the compliance with the nuclear safety criteria, as well as the criteria for supervising the RAW handling and RAW minimisation, with no major faults detected.

Handing of spent fuel and radioactive waste

Handling of radioactive waste constitutes an integrated system that includes the collection, separation, storage, processing, treatment, manipulation, and discharge of radioactive waste.
In 2009, NPP Mochovce generated 54 m^3 of liquid and 17 695 kg of solid radioactive waste, while NPP Bohunice generated 28.44 m^3 of liquid and 13 991 kg of solid radioactive waste.

RAW stored at the JAVYS, a.s. facilities

At nuclear facilities that are to be discarded (NPP A -1) secondary RAW are generated in connection with de-contaminating, dismantling, and demolition works. From the historical perspective, RAW from the Bohunice NPP A - 1 presents a unique issue, since the waste at this facility was not consistently separated and recorded during the facility's operation. Major part of liquid RAW from operation has already been treated to be stored, or its activity level has been reduced. Continually emerging concentrates (app. 40 m^3 per year) are treated through bituminisation every year. As of the

end of 2010, the summary inventory of liquid RAW (including the non-thickened) was 1 003.77 m^3. Summed-up volumes of solid RAW at NPP A-1 reached 784.4 m^3 of non-metallic RAW in 2010, and 825 tonnes of metallic RAW. Overall volume of stored contaminated soil and debris reached in 2010 the value of 18 405 m^3. Products from cement and bituminisation lines that are stored at the Bohunice NPP A -1 storage facilities prior to their treatment, represent almost 64 m^3.

RAW stored at the Mochovce National discharge site of RAW

As of the end of 2010, there were total 2 471 pcs. reinforced concrete containers stored, which represents app. 7 413 m^3 reinforced RAW from NPP A-1, NPP V-1, NPP V-2, and NPP Mochovce 1,2.

• CHEMICAL RISK FACTORS

Key questions and key findings

♦ Key questions

- **What is the trend in the contents of xenobiotics within the food chain?**

♦ Key findings

- **Comparison of the outcomes from the long-term monitoring suggests, especially in the case of heavy metals, a considerable improvement in the situation with the agricultural production in Slovakia. The most significant reduction is shown for cadmium. At present, most non-compliant samples result from the assessment of the mercury content.**
- **There is a gradual decrease in the contamination of game and fish; however, contamination still persists in industrial areas such as the region of Spiš and Gemer, Michalovce, and the area of Žiar nad Hronom. High average findings have been recorded for copper, lead, and mercury.**
- **In terms of the maximum permissible intakes by the human organism, none of the contaminants reached even half of the permissible limit.**

Monitoring of xenobiotics in the food chain

Volumes of xenobiotic substances in foods are regulated by limits published in the Slovak Food Code and compatible with the EU limits.

Monitoring for xenobiotic substances within the food chain focuses on the food chain components such as soil and inputs into soil, drinking water, feeding and irrigation water, forage, feedstock and food of the plant and animal origin from domestic production as well as from import. It has been implemented through the Partial Monitoring System (PMS). Partial monitoring system called: **Xenobiotic in foods and forage** is composed **of three subsystems**:

- Coordinated 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)

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.

49 491 samples were extracted over the entire monitored period (19 years), containing **2 963** limit-exceeding samples, which represents 6.0%. **In 2009**, total number of **2 246 samples** were extracted

from 378 hunts and subsequently analysed for content of chemicals, nitrates, and nitrites. Monitoring was carried out for 35 agricultural subjects (in 24 districts), analyzing soil samples from 28 446 ha, including the crop produced from this soil. Samples with limit-exceeding values in 2009 have been detected in feeding water, especially for nitrites and nitrates, and in case of soil, for mercury, cadmium, lead, chromium, and arsenic.

♦ Consumption pool monitoring (CPM)

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 9 Slovak sites.

Exposition of the public to xenobiotic substances is compared with permissible tolerable weekly intake for arsenic, cadmium, mercury, lead, tolerable daily intake for nickel, recommended daily dose for chromium, and acceptable daily intake for nitrates, PCBs, and pesticides. In each consumption basket there are analyses conducted for chemical elements, nitrates, nitrites, polyaromatic hydrocarbons, PCBs, selected pesticides residuals, residuals from veterinary medications, from microtoxins, as well as selected additives. Radioactive contamination was monitored for the samples of milk and drinking water.

Over the period of **seventeen years, 11 694 samples** were analysed, including **514** samples, i.e. **4.4%** that exceeded permitted limit values, especially in nitrates and chemical elements.

27 basic food items and drinking water (abstracted since 2007) are sampled for the consumption basket. In 2009, 411 samples were analysed, of which 4 (nitrates, cadmium, and thiabendazol) did not comply with the set limits. Outcomes of the consumption basket monitoring are assessed against the total intake of xenobiotic substances by the human organism, and they serve for scientific risk assessment for these substances.

♦ Monitoring of game, wildlife, and fishes

Monitoring of game, wildlife and fishes has been carried out since 1995 with the goal to gather information on the impact of the environmental contamination on the selected species of game and fish. (from free water formations) Since 1985, in total, there have been analysed 3 617 samples of fish, game, mushrooms, forest products, as well as feeding water and sediments from water formations. The set limits were exceeded by 20.8%; in the case of fish the findings were mainly negative due to increased contents of PCB, dioxins, mercury, and cadmium. Higher values for cadmium and mercury have been shown also for game and mushrooms. In 2009, there were 139 samples abstracted, of which 6.5% exceeded the limit, just like in the previous time period, exceeded were the limits for PCB in fish from 4 regions of Slovakia (Spišská Nová Ves, Šaľa, Senec, and Žilina).

• ENVIRONMENTAL LOADS

Key questions and key findings

♦ **Key questions**

- **What is the documented scope of environmental loads?**

♦ **Key findings**

- **As of the end of 2010, the total of 924 probable environmental loads was recorded in Slovakia, and 246 existing environmental loads.**

Present situation in the area of environmental loads and its solutions

In 2010, the Slovak Government Regulation no. 153/2010 approved the **National Programme of Remediation of Environmental Loads** representing a strategic document in this area for the years 2010 - 2015. It sets out priorities for environmental loads policy that are to be complied with through objectives and individual activities broken up into short-term, medium-term, and long-term time horizons.

On 05/08/2010, **Resolution of the Ministry of Agriculture, Environment and Regional Development of the Slovak Republic No. 340/2010** was adopted, which amends the Resolution 51/2008 executing the Geology Act. The mentioned amended Resolution provides detailed characteristics of the geological survey of the environment (including the survey and inspection of probable environmental loads or existing environmental loads, and once confirmed the existence of one, actual and potential risks of the environmental load are assessed in view of the present and future use of territories, and the geological documentation for proposed remediation of the environmental load are gathered). Next, definitions for environmental loads and environmental loads system are provided. Annex to Resolution contains an analysis of risks imposed by the polluted area.

Works on the draft of the **act on selected measures in the area of environmental loads and on amendments to selected laws** started in 2010.

Works that aimed to support initiatives in the area of environmental loads remediation through the funds obtained from the **Operation Programme of Environment** were completed for two projects:

- **Regional studies of environmental loads impact assessment for selected regions,** SEA (2008 - 2010)
- **Atlas of the remediation methods,** SGI (2008 - 2010)

Works on the project of **Completion of the environmental loads information system** still continued (SEA, 2008 - 2013). The project's aim is to complete the environmental loads information system, including its connectedness to other IS, as well as to implement an awareness-raising campaign regarding the system.

As of the end of 2010, the information system of environmental loads contained **924 probable and 246 existing environmental loads, and 696 remedied and recultivated sites.**

• NATURAL AND TECHNOLOGICAL HAZARDS

Key questions and key findings

♦ Key questions

- **What is the trend in the number of events that negatively impact the environment?**
- **What is the trend in the consequences of events that negatively impact the environment?**

♦ Key findings

- **Number of events of extraordinary water deteriorations over the last three years has remained roughly at the same level.**
- **Over the last three years the Slovak Environmental Inspection (SEI) has not detected any event leading to a deteriorated air quality.**
- **Number of fires in 2010 dropped, compared to 2009. On the long-term basis (2000-2010) the trend in fires shows fluctuating characteristics. Still, none of these years shows less than 8 000 fire events.**
- **From the hydrological standpoint, the year 2010 was very humid, which resulted in the occurrence of extensive floods.**
- **Total direct damages caused by fires in 2010 were 69 148.4 thous. EUR. On the long-term basis (2000-2010) this is the highest recorded damage volume.**
- **Total costs and damages caused by floods in 2010 reached the value of 526.31 mill. EUR.**

Accidental deterioration of water quality

In 2010, SEI recorded 100 extraordinary water deteriorations (EWD) - number of events over the last three years has remained at the same level. Of all recorded events, 42 were cases relating to surface water, and 58 were cases of threats or contamination of ground water.

Special declination or quality menace of water of the SR in the years 2000-2010

Year	EDW recorded by SEI	Special deterioration of water					
		Surface			Ground		
		Total number	Watercourses and basins	Water courses	Total number	Pollution	Endanger-ment
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
2008	102	49	0	6	53	4	49
2009	101	50	1	3	51	7	44
2010	100	42	0	2	58	2	56

Source: SEI

When compared with the previous year, the number of EWD caused by crude oil products and waste water decreased. On the contrary, the share of livestock excrements, insoluble substances,

caustic agents, and other substances on water deterioration increased. In three cases it was impossible to establish the kind of harmful or critically harmful substance.

Progress in number of WQEDA according to the sort of WDS in the years 2000–2010

Sorts of water deteriorative Substances (WDS)	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Oil substances	33	40	64	59	70	63	69	76	65	65	60
Alkalis	2	2	5	3	1	0	3	4	2	0	3
Pesticides	0	0	1	0	3	0	2	0	0	0	0
Excrements of farm animals	5	4	9	21	15	14	14	12	7	2	10
Silage fluids	4	0	2	1	1	0	0	0	0	0	0
Industrial fertilisers	0	0	0	1	0	0	0	0	0	0	1
Other toxic substances	12	5	3	3	0	4	4	5	2	1	1
Insoluble substances	5	2	6	11	3	4	3	3	2	2	4
Waste water	10	10	17	35	20	10	28	24	15	17	12
Other substances	2	1	3	7	10	8	6	7	3	1	6
Water detrimental substances impossible to determine	9	7	17	35	14	10	22	24	6	1	3

Source: SEI

Not even in 2010 was there any extraordinary water deterioration caused by pollution source outside the Slovak Republic. Unknown pollution producers have contributed to EDW with the significant and stable 15%, while the share of so-called foreign organisations on EDW was 16%.

Just like in the previous years, in 2010, human factor and poor technical condition of equipment or facilities for hazardous substances were the most frequent causes for EDW. Road transport and transportation have shown the greatest contribution to total EDW, with international travel operators and carriers being the greatest producers.

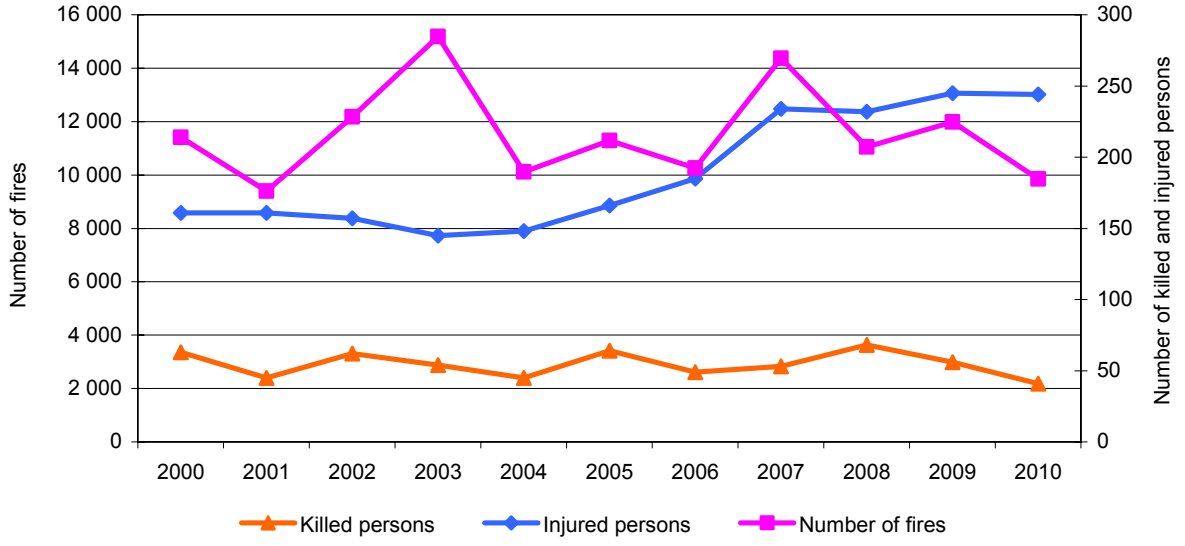
Fire risk

In 2010 were documented in the SR **9 851 fires**, causing 41 casualties and 244 injured**.** Although the number of fires dropped, direct material damage reached 69 148.4 thous. EUR, while the volume of preserved values was calculated at 353 695.7 thous. EUR.

In terms of damage cause by fires in individual industrial sectors, **most fires occurred** again **in the household sector** – 1 884, with 26 casualties and 153 injured persons. Direct material damage reached the value of 6 219.9 thous. EUR). In terms of fire statistics, **transport** shows the second greatest number of fires – 1 235, occasioning direct material damage at 6 612.7 thous. EUR, with 3 casualties and 16 injured persons. Least number of fires was recorded in the **commercial** sector, with 118 fires and direct material damage totalling 5 395.5 thous. EUR.

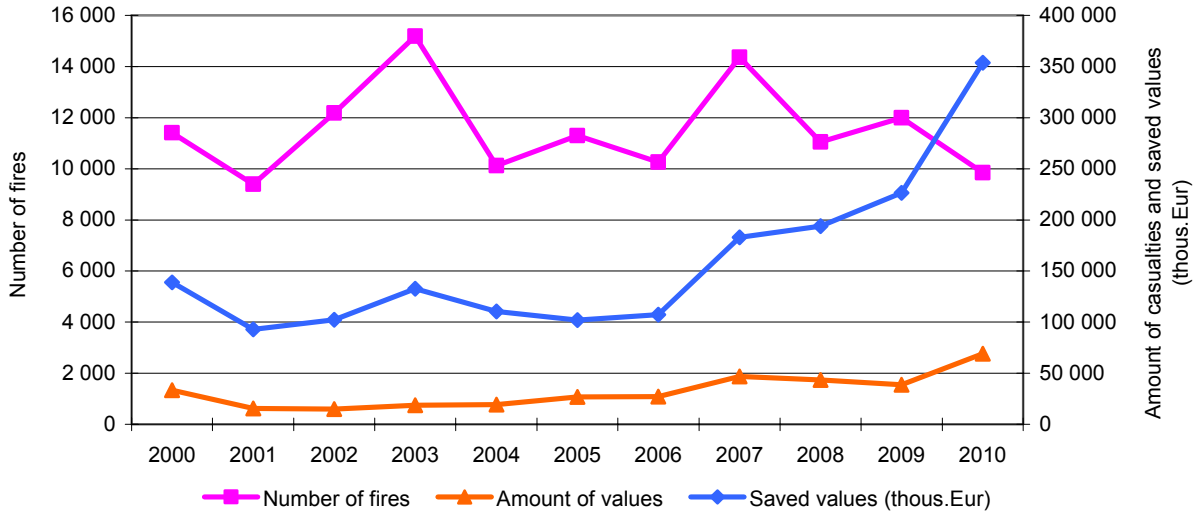
From the perspective of administrative distribution of territory, **most fires** occurred in 2010 in the Prešov region (1 711), while **least** fires were recorded in the Trenčín region (883). **Greatest damage** due to the occurrence of fires was recorded in the Bratislava region (18 982.3 thous. EUR) and the **least** in the Prešov region (1 782.3 thous. EUR).

Relationship between number of fires and number of killed or injured persons in 2000-2010



Source: FPRS MoI SR

Relationship between number of fires and number of casualties or amount of saved values in 2000-2010



Source: FPRS MoI SR

Floods

In 2010, there were 1 100 municipalities afflicted with floods, with 30 574 houses flooded (cellars and basements), 8 461 non-residential premises flooded, 92 079.7 ha of flooded agricultural land, 3 657.1 ha of flooded forestland, and 7 268.8 ha of flooded municipal land. 44 380 inhabitants felt the aftermath of the floods, including 10 085 persons who had to be evacuated.

Total cost and damages by floods in the SR in 2010 amounted to 526.31 mil. EUR, including the rescue costs of 17.93 mil. EUR, safety works of 27.53 mil. EUR, and material damage amounted to 480.85 mil. EUR.

Damage to state-owned property caused by floods totalled 241.33 mil. EUR, while damage to private property reached 48.47 mil. EUR. Damage to municipal property reached 76.54 mil. EUR and 57.7 mil. EUR in case of properties belonging to upper regional administrative areas. Damage to the property of legal and natural entities reached 57.34 mil. EUR.

Act No. 7/2010 Coll. on the protection against floods became effective in February of 2010. The Act incorporates the provisions of the Directive of the EP and of the Council 2007/60/EC on the assessment and management of the flood risks. Objective of this act is to create a framework for flood risk assessment and management in order to minimize adverse effects on the human health, environment, cultural heritage, and economic activities.

Floods aftermath over the period of 2004-2010

Year	Number of flood stricken residential	Flooded Territories (ha)	Damages by floods (mil. Eur)	Costs (mil. Eur)		Total costs and damages (mil. Eur)
				Rescue activities	Maintenance and safety activities	
2004	333	13 717	34.91	1.23	3.42	39.56
2005	237	9 237	24.03	2.24	2.67	28.94
2006	512	30 730	47.90	5.98	6.42	60.30
2007	60	339	2.49	0.30	0.21	3.00
2008	188	3 570	39.75	3.59	2.51	45.85
2009	165	6 867	8.41	1.59	1.30	11.30
2010	1 100	103 006	480.85	17.93	27.53	526.31

Source: MoA SR, MoE SR, WRI

• GENETIC TECHNOLOGIES AND GENETICALLY MODIFIED ORGANISMS

Key questions and key findings

♦ **Key questions**

- **Is there an impending risk for Slovakia associated with the use of genetic technologies and genetically modified organisms?**

♦ **Key findings**

- **Slovakia adopted a system of legal protection in the area of using genetic technologies and genetically modified organisms, that is fully compatible with the EC policies. The use of genetic technologies and genetically modified organisms is subject to a stringent process of assessment and approval in order to minimize the risk.**

Using of 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.

Based on the received applications, the Slovak Ministry of Environment in 2010 issued permission to five users to use, for the first time, closed facilities and had no objections to the nineteen reports it received that dealt with the start of activities in closed facilities. Of the number of 21 users, two carried out the RT 2 activities.

As to date, the Ministry has not received applications for permission to start the RT3 and 4 activities.

♦ Intentional release

In 2010, the Slovak Ministry of Environment issued 3 permissions for testing cultivation of genetically modified corn, and 1 permission for testing cultivation of genetically modified sugar cane.

♦ 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. Commission administered by the department of biological safety of the Slovak Ministry of Environment of the SR has 11 permanent members and 15 experts who come from a wide spectrum of professionals in the area of science or other sectors, together with state officers appointed for the individual involved resorts, and representatives of the public, including users and citizens.

The committee met 20 times in 2010. The commission commented on the reports adopted by the EU, proposals to issue licenses for the first use of closed facilities, and on the notification reports on launching operations in closed facilities.

ENVIRONMENTAL CARE

• ENVIRONMENTAL LAW

The published Slovak legislation in 2010 included 10 acts, 4 SR government regulations, 30 resolutions of the MoE SR, and 1 decree.

♦ Acts

- Act No. 3/2010 Coll. on the national infrastructure for spatial information
- Act No. 4/2010 Coll. which amends Act 205/2004 on collection, storage, and dissemination of information on the environment and amendment to other laws as amended
- Act No. 7/2010 Coll. on protection against floods
- Act No. 110/2010 Coll., which amends Act 569/2007 Coll. on geological works (Geology Act) as amended
- Act No. 134/2010 Coll. which amends Act 364/2004 on water and amendment to the Slovak National Council Act 372/1990 Coll. on offences as amended
- Act No. 117/2010 Coll. which amends Act 543/2002 Coll. on nature and landscape protection as amended, and on amendment to Act 24/2006 Coll. on environmental impact assessment and amendment to selected laws as amended
- Act No. 119/2010 Coll. on packaging which amends Act 223/2001 on waste and amendment to other laws as amended
- Act No. 137/2010 Coll. on air
- Act No. 145/2010 Coll. which amends Act 24/2006 on environmental impact assessment and amendment to other laws as amended
- Act No. 268/2010 Coll., which amends Act 569/2007 Coll. on geological works (Geology Act) as amended

♦ SR Government Regulations

- SR Government Resolution 206/2010 Coll., which amends SR Government Resolution 388/2005 Coll., and sets the limits for the treatment of electric waste, and for recovery and recycling of components, material, and substances
- SR Government Regulation 269/2010 Coll. which stipulates criteria for achieving good water balance
- SR Government Regulation 270/2010 Coll. on environmental quality standards in the area of water strategy
- SR Government Regulation 282/2010 Coll. which stipulates limit values and list of groundwater formations

♦ Resolutions of the MoE SR

- MoE SR Resolution 159/2010 Coll., which amends MoE SR Resolution 131/2006 Coll., which sets forth requirements for the national emission caps and total number of pollutants quota as amended by the MoE SR Resolution 203/2008 Coll.
- MoE SR Resolution 187/2010 Coll., which declares the Special protection area of Veľkoblahovské rybníky
- MoE SR Resolution 189/2010 Coll., which declares the Special protection area of Low Tatras
- MoE SR Resolution 192/2010 Coll., which declares the Special protection area of Slovak karst
- MoE SR Resolution 193/2010 Coll., which declares the Special protection area of Slanské hills
- MoE SR Resolution 194/2010 Coll., which declares the Special protection area of Veľká Fatra
- MoE SR Resolution 196/2010 Coll., which declares the Special protection area of Volovské hills
- MoE SR Resolution 202/2010 Coll., which declares the Special protection area of Záhorské Pomoravie
- MoE SR Resolution 203/2010 Coll., which amends MoE SR Resolution 125/2004 Coll., which sets forth details concerning the treatment of old vehicles and selected criteria for the production of vehicles as amended by MoE SR Resolution 227/2007 Coll.
- MoE SR Resolution 204/2010 Coll., which defines details on the implementation of the flood forecasting service
- MoE SR Resolution 251/2010 Coll. which defines details regarding the assessment of expenditures to flood-prevention works, flood rescue works, and flood-related damage
- MoE SR Resolution 252/2010 Coll., which defines details on the submission of interim informative reports on floods and summary reports on the duration and aftermath of floods and on adopted measures
- Resolution 255/2010 Coll. executing the Act on handling of waste from mining industry and amendments to other laws
- MoE SR Resolution 261/2010 Coll., which sets details on the content of the flood plans and their approval
- MoE SR Resolution 262/2010 Coll. which sets forth the contents of public water supply restoration plan, public sewerage systems restoration plan, and the strategy of their development
- MoE SR Resolution 263/2010 Coll., which amends MoE SR Resolution 283/2001 Coll., on the execution of selected legal provisions on waste as amended
- MoE SR Resolution 313/2010 Coll., which sets details on the preliminary flood risk assessment, its revision and updating
- MoE SR Resolution 314/2010 Coll. which sets for the contents of the programme for the reduction of emissions from the stationary air pollution sources and the contents of data and strategies for informing the public
- Resolution of the Ministry of Agriculture, Environment and Regional Development of the Slovak Republic 340/2010 Coll., which amends MoE SR Resolution 51/2008 Coll., which executes the Geological Act

- Resolution of the Ministry of Agriculture, Environment and Regional Development of the Slovak Republic 356/2010 Coll., which executes selected provisions often Air Act
- Resolution of the Ministry of Agriculture, Environment and Regional Development of the Slovak Republic 357/2010 Coll. which sets forth criteria regarding the keeping of records and other information on stationary air pollution sources
- Resolution of the Ministry of Agriculture, Environment and Regional Development of the Slovak Republic 358/2010 Coll. which sets the emission limits, technical criteria, and general conditions for the operation of resources and their equipment using organic solvents, and emission monitoring
- Resolution of the Ministry of Agriculture, Environment and Regional Development of the Slovak Republic 359/2010 Coll. on requirements for limiting the emissions of volatile organic compounds escaping at use of organic solvents in regulated products,
- Resolution of the Ministry of Agriculture, Environment and Regional Development of the Slovak Republic 360/2010 on air quality
- Resolution of the Ministry of Agriculture, Environment and Regional Development of the Slovak Republic 361/2010 Coll. which defines technical criteria and general conditions for the operation of stationary air pollution sources that operate equipment used for storing, filling, and transport of gasoline, and the strategy and criteria for the enquiry and proving of data related to their compliance
- Resolution of the Ministry of Agriculture, Environment and Regional Development of the Slovak Republic 362/2010 Coll. which determines the criteria for the quality of fuel and the operative keeping of records on fuel
- Resolution of the Ministry of Agriculture, Environment and Regional Development of the Slovak Republic 363/2010 Coll. on monitoring emissions, technological criteria and general conditions for operating stationary air emission sources, and ambient air quality
- Resolution of the Ministry of Agriculture, Environment and Regional Development of the Slovak Republic 418/2010 Coll., on execution of selected provisions of the Water Act
- Resolution of the Ministry of Agriculture, Environment and Regional Development of the Slovak Republic 419/2010 Coll. which sets forth details on the elaboration of the flood threat maps, on paying the fees for their creation, revision and update, and on proposing and plotting the size of the inundation territory on maps
- MoE SR Resolution 448/2010 Coll. which amends Act 205/2004 on collection, storage, and dissemination of information on the environment and amendment to other laws as amended

♦ Decree

- MoE SR Decree 2/2010 Coll. of September 16, 2012, which sets details on designation of watershed administration areas, environmental objectives, economic analysis, and on water planning (Notice No. 396/2010 Coll.).

• ENVIRONMENTAL IMPACT ASSESSMENT

The process of environmental impact assessment in the conditions of Slovakia is regulated by **Act 24/2006 Coll. on environmental impact assessment and on amendment to other laws.**

In 2010, this Act **was amended** by Act 145/2010 Coll. as a result of formal notification by the EC, in which Slovakia was cautioned about their faulty adoption of Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment as amended by Council Directive 97/11/EC a Council Directive 2003/35/EC.

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 2010, 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.

Number of completed assessments of the proposed activities (EIA) and strategic documents (SEA) in the SR in 1994–2010

	EIA	SEA
1994	1	-
1995	67	-
1996	75	-
1997	72	-
1998	56	-
1999	35	-
2000	43	-
2001	227	-
2002	345	-
2003	436	-
2004	498	-
2005	526	-
2006	329	16
2007	734	81
2008	889	160
2009	649	99
2010	544	149
Total	**5 526**	**505**

Source: MoE SR

Outcomes of the EIA and SEA process in 2010

MoE SR level	
Number of assessed buildings and activities - EIA	167
Number of final positions issued - EIA	185
Number of assessed drafts of strategic documents - SEA	5
Number of final positions issued - SEA	7
Number of statements on activities change	63
Environmental authorities level	
Number of assessed buildings and activities - EIA	383
Number of decisions and final positions issued - EIA	368
Number of assessed drafts of strategic documents - SEA	135
Number of decisions and final positions - SEA	143
Number of statements on activities change	98

Source: MoE SR

• INTEGRATED POLLUTION PREVENTION AND CONTROL (IPPC)

IPPC was introduced into the Slovak legal codes and implemented through **Act No. 245/2003 Coll. on integrated environmental pollution prevention and control and on amendments of certain laws as amended (Act on IPPC)**.

Slovak Environmental Inspection (SEI) is the administrative body in the process of integrated licensing and issuing of licences. At the same time, the organization also assumes the role of a controlling body in this process.

In 2010, operators submitted **616 applications in total** for obtaining integrated licenses (decision). In 430 cases of all the submitted applications, the operators asked for a change to conditions of the already issued integrated license, 173 applications addressed construction licensing, since SEI has been involved in the IPPC process supervised by a special construction authority, in 13 cases an application for new operation facility was submitted. In 1 case the operator who owns an integrated license pursuant to sect.2(4)(b) of Act on IPPC (voluntary application for the issuance of an integrated license) applied to a change to this license.

Of **total number of 537 issued decisions,** 370 licenses addressed licensing the changes to operation pursuant to sect.8(7) of the Act on IPPC, and 159 cases dealt with proceeding initiated by the special construction authority pursuant to sect.8(3) of the Act on IPPC. Integrated licenses were issued for 8 cases with new operation. 2 decisions were issued on the elimination of a construction site, and 4 decisions were issued to suspend the proceeding.

Of the total number of 253 executed **inspections** of operations in 2010, 65 operations were shown as non-compliant with the license criteria. Based on the conclusions of the inspections, 260 measures were adopted. In 157 cases the operations were declared compliant to the license criteria, and in 41 cases the operators were asked to take remedial measures within a set time period. In 59 cases the Slovak Environmental Inspection imposed a fine for a discovered administrative infraction, while three operators were ordered to submit an application for integrated licensing change within a set deadline.

• 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.

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 – www.enviroportal.sk/environmentalne-skody/.

In 2010, there was no environmental damage recorded in Slovakia.

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.

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)**.

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.

In 2010, there was 1 major technological hazard and 2 immediate threats of major technological hazards.

• ENVIRONMENTAL ASSESSMENT AND PRODUCT LABELLING

Environmental labelling of products in Slovakia has been carried out since 1997. At that time the Minister of Environment declared the **National Programme of Environmental Assessment and Product Labelling (NPEHOV).** Gradually, over the subsequent years, environmental criteria for 34 product categories were created by the Slovak Ministry of Environment through its NPEHOV directives, decrees and notices.

On the basis of the expressed interest by producers or importers, it is possible to assess compliance of the registered products with unique conditions for the mentioned product category under the Slovak Ministry of Environment's notice with the objective to grant the right to use the national environmental label of **"Environment-friendly product"**. In total, (1997-2000) as many as 339 products were received the national environmental label, of which 27 national brands in 2010 were labelled as "Environment-friendly product". 146 products had the right to use environmental product labelling in 2010.

Special regulations apply for granting and use of the European Community environmental label. The fundamental legislation is the EU Parliament and Council Regulation (EC) No. 1980/2000/EC (as from February 2010 a new EU Parliament and Council Regulation 66/2010/EC on **EU environmental labelling** came into effect) along with the criteria for specific groups of products published by the European Commission decision.

• ENVIRONMENTAL MANAGEMENT AND AUDIT

In furtherance of the objectives of environmental policy alongside the traditional instruments of the so-called command and control solid management tools are used more and more so-called soft management tools. They are based on a principle of common and shared responsibility between states and organizations. The tool set also includes environmental management, e.g. the international standard ISO 14001:2004, which establishes the requirements for **environmental management system** (EMS). Higher reliability, efficiency, transparency over a certificate confirming compliance with the standard, organizations can gain registration in the **scheme of the European Community Eco-Management and Audit Scheme** (EMAS).

In the course of 2010, 96 new organisations with introduced and certified EMS started in Slovakia, six organisations lost their EMS certificate, raising the total number of organisations with the valid EMS to 868, as of December 31, 2010. Trend in the increment of newly issued certificates over a single year shows a falling tendency since 2008 (from 189 in 2008 to 96 in 2010), probably caused by the financial and economic crisis.

♦ The European Eco-Management and Audit Scheme (EMAS)

Criteria for participation in the EMAS organisation are set forth by the EU Parliament and Council Regulation (EC) No. 1221/2009 on the voluntary participation by organisations in a Community eco-management and audit scheme, the so-called EMAS III.

In the EMAS register as of December 31, 2010, there were 4 542 registered organisations located at 7 794 sites registered within the EU.

• GREEN PUBLIC PROCUREMENT

Green public procurement (GPP) represents one of the effective tools that create demand on the market for environmentally friendly products and thus support their supply and create a pressure leading to their innovations. Inclusion of the environmental aspect into public procurement aims at motivating the producers to design new products and technologies with less adverse impacts on the environment.

The **National Action Plan for Green Public Procurement** in the SR for the years 2007 - 2010 (NAP GPP) suggests a strategic goal to improve environmentally-friendly conduct of the public sector through raising the level of applying green public tendering procedures and thus achieve the level average to 50% of the implemented number of contracts as set forth by the European Commission.

In order to assess the level and the benefit of the GPP, the Slovak Ministry of Environment conducts a survey, assessing 2 basic indicators in particular:

Indicator 1 - *share of GPP on total public procurement **in relation to the number of contracts** (signed contracts and orders) in %,*

Indicator 2 - *share of GPP on total public procurement **in relation to the volume of contracts** (signed contracts and orders) in %.*

As part of the survey of 2010, 86 subjects responded, of which **82** were **public suppliers** *(pursuant to Sect.6 (1) of Act 25/2006 Coll. on public procurement and on amendment to selected laws as amended (hereinafter only "public procurement act")* and which included 55 central government authorities and their daughter organisations, 4 regional governments, 23 municipalities, and **4 suppliers** pursuant to Sect. 8 of Act on public procurement, which is a 35.5% response rate.

Of those surveyed in 2010, 50 subjects applied the GPP principles through incorporating the environmental criteria into public procurement, which is 58.14% of all the respondents. 6 subjects did not provide necessary information on total number of public tendering procedures and their total volume; therefore, they were not included into the overall assessment of the average GPP level in the Slovak Republic. 30 subjects that participated in this survey did not implement the GPP principles in 2010. The respondents who sent in their complete data carried out 1 985 contracts at the volume of 311 780 722.24 EUR through applying the GPP principles (the so-called "green contract").

Trend in two fundamental GPP assessment indicators in Slovakia

Year	2007	2008	2009	2010
Indicator 1	11.50	4.98	11.16	9.83
Indicator 2	4.30	39.84	27.91	***50.95***

Source: MoE SR

Based on the indicator 2 figures we can conclude that in 2010 the NAP GPP indicative target was met - reaching a 50% share of green public tendering procedures on all public procedures in relation to their volume.

• ENVIRONMENTAL ECONOMY

Expenditure on environmental protection

Expenditures of the private and public sectors on the environment expressed as a GDP share dropped since the middle 90ties of the 20th century approximately by one half to 1.1% in 2009.

Public and private investments into the environment grew over the assessed period; however, when expressed as percentage, they remained at the level of 0.4% for the assessed period.

Since 2002, public expenditures for environmental protection have dropped from 0.9% down to 0.7% of GDP. Expenditures of the state budget were reduced as part of the decentralization process, while expenditures of local administration have increased significantly and in 2009 they were more than 60% of public expenditures to the environment.

The environmental fund and recycling fund

The environmental fund was established since January 1, 2005, by Act 587/2004 Coll., on environmental fund and amendment to certain laws.

Review of financed grants in 2010

Area of budget grants	Number	€
Protection of air and of ozone layer	14	1 125 996.00
Protection and rational efficiency of water	299	29 755 910.00
Development of waste management	14	1 130 900.00
Protection of nature and lands	8	1 484 000.00
Environmental education and promotion	36	1 029 891.66
Survey, research and development	9	1 150 300.00
Accidents	2	15 160.65
Solution of extremely critical environmental situation	12	1 789 563.74
Programme of rebuilding the village	182	659 528.43
Total	**576**	**38 141 250.48**

Source: Environmental fund

Of the total volume of given subsidies in the amount of 38 141 250.48 EUR, 3% of funds were used in the area of air and Earth's ozone layer's protection, 78% of funds were used in the area of water protection and use (of which: 75.9% to WWTPs and sewerages, 21.0% to water supplies, and 3.1% to flood prevention measures), in the area of waste management development - 3%, in the area of nature and landscape protection - 3.9%, in the area of environmental education, formation, and awareness raising - 2.7%, in the area of survey, research and development focused on investigation and improvement of the environment - 3%, in the area of hazards and accidents - 0.03%, in the area of extremely critical environmental situation - 4.7%, and the Village Renewal Programme - 1.7%.

Fees for pollution and exploitation of natural resources

In 2010, the highest sum collected for environmental pollution by the Environmental Fund came from air pollution fees (12 931 532 EUR), while the highest sum collected while exploiting natural resources came from fees for ground water consumption (11 762 165.49 EUR).

Gains from the Environmental Fund of selected economic instruments applied in 2010 (€)

Charges	€
Charges for pollution of air	12 931 532.00
Fees for wastewater discharge	9 304 557.25
Penalization for the failure to pay air pollution fees	3 840.05
Financial compensation for damage to the habitat of European importance	81 552.50
Fees for groundwater extraction	11 762 165.49
Fees for surveying area	647 758.57
Fees for extracted minerals	1 946 068.02
Charges for storage of gases and liquids	1 183 144.04
Charges for water from a healing natural source or from natural mineral resource	8.00
Total:	**37 860 625.92**

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.

Fines imposed by the State administration environmental authorities (thous. EUR)

Sector	2000	2006	2007	2008	2009	2010
Protection of air	54.57	117.67	85.11	162.42	128.01	65.19
Protection of water	200.42	492.33	420.87	396.34	279.13	228.10
Wastes	305.82	319.82	325.73	309.33	550.25	228.91
Protection of nature	49.72	89.72	107.12	1 692.62	73.07	68.46
Penalization	13.84				800.56	
Building law	36.21	8.13		1.59	15.36	0.69
Packaging		10.29		9.96	3.32	20.40
Prevention of gross industrial averages		7.50		0.66	0	6.10
Trading with endangered species of animals and plants		5.31		5.81	2.54	0.01
Public water-supply and sewages		0		0.80	1.49	5.90
Integrated prevention and control		9.43	47.80	104.96	8.44	102.84
Genetic technologies and GMO		1.66	0.10	0.20	0	0.09
Geological works					0	0.30
Fishery		0.10			0	0.01
Total	**660.59**	**1 061.97**	**986.72**	**2 684.69**	**1 862.18**	**727.16**

Source: SEI

In 2010, the highest fined sum was collected in the area of waste management (228.91 thous. EUR) and in the area of water protection. (228.10 thous. EUR).

Environmental tax

In 2009, revenues from environmental tax were 1.9% of GDP, and 6.6% of total revenues from taxes. Slovakia was way below the average values displayed by the OECD European member states regarding the GDP share. However, as to the share on total revenues, Slovakia was above average.

Funding the environmental care within international programmes/projects

♦ Operational Programme Environment

Operational Programme Environment (OPE) is the programming document for Slovakia in order for using the EU funds in the area of environment for the years of 2007-2013. Slovak Ministry of Environment is the supervisory body.

Over the year 2010, the Slovak Ministry of Environment issued **7 calls** for applications for non-refundable financial benefit (NRFB), with total allocated sum of 367 342 883 EUR.

List of approved projects, December 31, 2010

Priority axis	Number of approved projects	Sum of approved grants (structural funds/cohesion funds and national budget in EUR)	% of allocation to priority axis
1. Integrated protection and rational water exploitation	118	604 812 487	56.15
2. Flood protection	36	48 804 526	34.57
3. Air protection and minimisation of adverse impacts of climate change	109	200 815 114	94.83
4. Waste management	192	313 335 783	54.91
5. Protection and regeneration of natural environment and landscape	40	55 962 888	93.72

Source: ITMS

Comprehensive lists of registered and approved applications for NRFB are published on the website of the Slovak Ministry of Environment: www.opzp.sk

Large-scale projects (exceeding 50 million EUR)

As of 31/12/2010, 3 applications for confirming the assistance were submitted to the EC. These included large-scale projects of: "SKK Ružomberok, and WWTP of Liptovská Teplá, Liptovské Sliače", "Water supply, connection to waste water sewerage system and WWTP in the Ilava district", and "WWTP intensification, connection to waste water supply and drinking water supply in the Trenčín region".

As of 31/12/2010, the Slovak Ministry of Environment received 4 applications for NRFB for the following projects:

- Podunajsko - connecting of the lower Danube Bratislava region to waste water sewerage system,
- Water supply and sewerage system construction of the Orava region, 2nd phase,

- Prievidza - complex for connection to waste water sewerage system and waste water treatment,
- WWTP North - Reconstruction and intensification of WWTPs of Bánovce, Partizánske, Topoľčany.

♦ Central Europe Operational Programme

For Slovakia, the whole national territory may qualify for this programme. Total financial allocation for Slovakia from this programme for the period of 2007-2013 represents 9.8 mil. EUR. Costs assumed by the Slovak project partners can be supported from the ERDF funds, up to 85%. The partners must fund the remaining part of expenditures out of their own budgets.

The CU OP objectives are achieved through the following Priority axes that are worked down to the level of interventions.

Priority 1: Facilitating of innovations in Central Europe
Priority 2: Improving the accessibility of Central Europe and within it
Priority 3: Responsible use of the environment
Priority 4: Increasing the competition and attractiveness of cities and regions
Priority 5: Technical assistance for the supporting implementation and capacity building

Within the call for project proposals, 29 projects proposals were approved at the total sum of 66.8 mil EUR from the ERDF, with co-funding from the public sources is 15.1 mil. EUR and co-funding from private sources is 2.2. mil. EUR.

Within the second call for proposals, there were total of 37 projects approved with the participation of Slovak project partners in 18 of them.

Within the third call for proposals there were 28 projects approved in the area of innovations, accessibility, environment, and competitiveness of cities and regions. 22 subjects from the SR have been involved in 14 projects.

Budgeted funds of the Slovak projects partners involved in the projects that have not been classified under any of these three calls, total around 12 700 000 EUR. This sum still does not include budgeted funds of 11 project partners from the SR involved in strategic projects that will be approved within the year 2011 under a special call.

♦ Programme of supranational cooperation of South-Eastern Europe

For Slovakia, the whole national territory may qualify for this programme. Total financial allocation for Slovakia within the OP SEE for the period of 2007-2013 represents **9.896 mil. EUR**.

The following Priority axes have been defined within the OP JvE programme:

Priority 1: Facilitating of innovations and business activities
Priority 2: Environmental protection and improvement

Priority 3: Improving the accessibility

Priority 4: Development of supranational synergies for sustainable growth areas

Priority 5: Technical assistance for the supporting implementation and capacity building

Priority axes are further developed into the **intervention level areas**. Under the 1st call for project proposals there were 40 projects approved with total budgeted sum of 76 628 855 EUR from ERDF. Of total number of approved projects there are 15 projects involving 23 Slovak project partners; in 2 projects the Slovak partners take the leading partner role.

Under the scheme **Priority 2 Protection and improvement of the environment** there were approved 4 projects with the participation of 5 project partners from all over Slovakia, with the budget of 1 720 445.82 EUR contributed by the ERDF.

Under the 2nd call for proposals in 2010, there were 21 projects approved at total amount of 37 mil. EUR of the contribution applied for. Of total number of approved projects there are 8 projects involving 14 Slovak project partners; in 1 project the Slovak partners including 1 associated partner and 4 watching partners.

♦ Program LIFE+

The LIFE+ program has three main components for which possible funding may be requested: **Nature and Biodiversity, Environmental Policy and Management, Information and Communication**.

Allocation of financial means from the SR in 2007 was 2.857 mil. EUR, in 2008 it was 3.171 mil. EUR, in 2009 it was 3.83 million EUR, and for **2010 it was 3.719 mil. EUR**. This sum is to increase from year to year.

In 2010, the SR proposed 8 projects, while in case of 2 projects the Slovak organisations were only partners. Outcomes of the assessment and approval of proposed projects will be published by the end of 2011.

♦ Global Environmental Facility

In the period from 1.7.2006 to 30.6.2010, a new programming period started for the Global Environment Facility initiative (GEF 4), with the priority areas narrowed down to climate changes and biodiversity. In the area of Biodiversity, Slovakia was placed in a group of 93 countries with an average allocation per country up to 3.5 mil. USD by 2010. In the area of Climate changes, Slovakia was assigned an individual allocation of 5.7 mil. USD by 20101; however, the approved projects will be implemented until 2014. For the new fifth programming period (GEF 5), Slovak Republic has not been classified among donor countries.

Slovakia has been taking part in the GEF initiative since 1994. **In total, there were 14 national projects approved with the funding of 24.471 million USD**. 9 projects were completed before the end of 2010. Slovak organizations continue to participate in 14 international projects, with 3 other international projects in preparation.

♦ Norwegian financial mechanism

Based on the agreement between the EU countries and the EFTA countries, in the period of May 1, 2004 to April 30, 2009, Norway, Island, and Lichtenstein bound themselves to offer Slovakia and other countries a financial assistance of about 67. mil. EUR.

Two separate financial mechanisms were created by signing memoranda of understanding in the beginning of 2005; these are **the EEC financial mechanism (EEC FM), and the Norwegian financial mechanism (NFM).**

In the priority areas of **Environment protection and Support of sustainable development** there were 11 individual projects approved for each of the areas. SR signed agreements for more than 100 projects, including 7 block grants and 93 individual projects. These projects have taken up more than 99% of net allocation of funds, which is about 65 million EUR. Projects submitted by applicants from the public and third sectors are co-funded up to 15% of the SR national budget. The funds must be used by April 30, 2011.

In October of 2010, Norway, Island, and Lichtenstein signed with Slovakia as the receiving country **Memoranda of understanding for the implementation of the EEC FM/NFM of 2009-2014.** For the years to come, funds contained in the EEC FM/NFM with total allocation of **80.75 million EUR** are to be directed into a number of priority areas, such as adapting to the climate change, protection and revitalisation of the cultural and natural heritage, carbon take-up and storage, green innovations within the industry, support of non-government organisations, scholarships.

The biggest priority areas under the new agreement include the environment and the climate changes. In total, 31 million EUR have been allocated to programmes focusing on adapting to the climate changes, carbon take up and storage, and green innovations within the industry.

♦ Swiss Financial Mechanism

For the SR, the allocated volume of funds is 66 866 000 Swiss franks (CHF), which is around 41 mill. EUR.

Priority axis 2 - Environment and infrastructure contain the following speciality areas:

2.1 Renewal and modernisation of the basic infrastructure and improving the quality of the environment,

2.2 Nature protection.

2.1 Renewal and modernisation of the basic infrastructure and improving the quality of the environment

Total allocated sum for this speciality area is equivalent to 22 941 176 CHF, of which 19 500 000 CHF has been contributed by the Swiss Confederation, which is 85% of total allocated funds. The remaining 15% represent a contribution from the national SR budget.

In February 2010, the call for Renewal and modernisation of the basic infrastructure and improving the quality of the environment was closed. Under this call, 39 proposals for non-refundable financial benefit (NRFB) were received in the quality of project concepts. **Representatives of the National**

Monitoring Committee for the National Financial Mechanism recommended 9 NRFB proposals in the quality of projects concept to be considered by the Swiss Confederation, with total asked sum for 32 401 370.79 EUR (which means over-budgeting for the specific call by 84%).

2.2 Nature protection

Total allocated sum for this speciality area is equivalent to 5 882 353 CHF, of which 5 000 000 CHF has been contributed by the Swiss Confederation, which is 85% of total allocated funds. The remaining 15% represent a contribution from the national SR budget. State Nature Conservancy (SNC) is the eligible beneficiary within the Slovak Ministry of Environment.

On the basis of a Direct Order under 2009-05, the State Nature Conservancy submitted in 2010 a project concept called **Trend in the conservation of nature and protected areas within the Slovak Carpathians** with total requested NRFB of 1 949 825.18 Eur. In September of 2010, the Swiss Confederation approved the mentioned project concept with specific conditions. The final project was submitted by the State Nature Conservancy in the beginning of December of 2010. Decision of the Swiss Confederation on the final project proposal is expected to take place in August-September 2011.

• COMPLEX ENVIRONMENTAL MONITORING AND INFORMATION SYSTEM

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.

Partial monitoring systems

PMS	Guarantor	Centre	Monitored subsystem	
Air quality	MoE SR	Slovak Hydro Meteorological Institute	• Air quality monitoring • Ground atmospheric level	
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 the SR • Waste recovery facilities	• Waste disposal facilities • Interstate transport of hazardous waste
Biota	MoE SR	State Nature Conservancy of the SR Banská Bystrica	• Fauna • Flora • Biotopes	
Geological factors	MoE SR	State Geological Institute of Dionýz Štúr in Bratislava	• Landslides and other slope deformities • 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 alluvial sediments • Volume activity of Radon in geological layers

Soil	MoARD SR	Soil Science and Conservation Research Institute in Bratislava	• Basic network • Key locations	• Spatial monitoring of agricultural lands (318 monitoring areas) • Forest land monitoring (112 areas)
Forests	MoARD SR	National Forest Centre in Zvolen	• Extensive periodical monitoring - 112 permanent monitoring areas (I. level) • Intensive periodical and continuous monitoring – 7 permanent monitoring areas (II. level)	
Xenobiotic substances	MoARD 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. EUR)

PMS	2002	2004	2005	2006	2007	2008	2009	2010
Air quality	951,04	610,77	560,98	961,66	1 916,88	1 179,11	989,16	566,58
Meteorology and climatology	939,39	1 161,79	864,07	2 523,17	982,84	2 409,55	742,66	361,65
Water	1 474,94	803,03	1 451,14	1 475,37	3 334,00	1 756,57	4 817,57	522,38
Radioactivity	88,56	48,26	49,79	84,48	76,38	49,79	39,43	30,75
Waste	116,18	116,18	126,14	34,52	144,53	79,43	60,51	21,15
Biota	19,92	19,92	33,19	33,19	33,19	17,09	0,00	0,00
Geological factors	331,94	331,94	331,94	331,94	298,75	348,54	348,54	289,39
Soil	305,38	305,38	318,66	302,06	232,36	267,24	206,84	133,51
Forests	57,09	96,26	146,05	265,55	569,57	337,68	369,58	362,0
Xenobiotic substances	897,30	908,88	413,40	507,90	282,15	351,74	387,30	402,0
Total costs	**5 181,74**	**4 402,41**	**4 295,37**	**6 519,85**	**7 870,64**	**6 796,75**	**7 961,59**	**2 689,41**
MoE SR costs	3 921,96	3 091,88	3 417,25	5 444,33	6 786,56	5 840,09	6 997,98	1 791,9

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 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.

• ENVIRONMENTAL EDUCATION

In 2010, there were carried out within the environmental education:

♦ Conferences, seminars, workshops, round tables

- **Enviro-i-forum 2010** - annual conference on the environmental informatics, with the accompanying events
- **Meeting of natural scientific workers** - VIII. international conference

♦ Festivals, exhibitions, presentations

- **ENVIROFILM 2010** - XV. international festival of films with the topic of environment creation and protection
- **Speleophotography** - 15. international exhibition of art photography with speleological issue
- **Children's Day at the ZOO**
- **Events** for the World Water Day, Earth Day and World Environment Day

♦ Other projects for the public

- **ProEnviro -** 6th year of an annual competition looking for the best environmental project organised by the school
- **EnviroQuestions -** VI. annual national correspondence trivia competition for pupils of the higher school classes (5th -9th) dedicated to the topic of environment
- **Hypericum -** naturalistic competition focused on knowledge of natural values and also on the cultural heritage of various regions of Slovakia
- **Ecological footprint** - an innovative educational program in progress via a web portal www.ekostopa.sk
- **On a hike with NATURA** - school program for mapping the biodiversity in Slovakia, on the web portal www.snaturou2000.sk
- **BEAGLE - an online free biodiversity project open to all schools in Europe**. The schools report dates of flowering, leaf burst and other phenological events along with photos to the web site http://www.beagleproject.org.
- **Fair of the environmental educational programmes of ŠIŠKA 2010** - XIII. annual fair of the environmental educational programmes for the people dealing with environmental education
- **Camp of nature protectors TOP 2010** - 46. annual camp

♦ Building of education paths

Important and highly used elements of the infrastructure of environmental infrastructure are **education paths**.

Overview of building the education paths in 2010

Resort / institution	Number of constructed paths
Environment resort / SEA, SNC SR	126
Agriculture resort / Forests of the SR, NFC	7
Education resort / Primary schools, Secondary vocational schools, Free time centres	7
Self-government / Municipal authorities, Information centres, Museums, ZOO	57
NGO´s	30

Source: MoE SR

INTERNATIONAL COOPERATION

Major initiative in the area of **bilateral cooperation** in 2010 pointed toward a cooperation with the neighbouring countries in the interest of stimulating trans-boundary and Euro-regional cooperation with the Czech Republic, Poland, Austria, Ukraine, and Hungary. The core topics of these meetings and projects with the neighbouring countries included intensification of the cooperation leading mainly to the development of the border regions.

Special attention is given to negotiations with the neighbouring countries - Austria, Hungary, Czech Republic, and Ukraine in the area of discussing project drafts with the possible trans-boundary impact on the environment. Project discussion phase has been implemented in compliance with the obligations set forth by the EEC UN Convention on environmental tans-boundary impact assessment.

The Slovak Ministry of Environment in 2010 supervised the signing of an international treaty - Supplement no.2 to "Agreement on the Conservation of Populations of European Bats (EUROBATS)" (Bristol 24.-26., July 2000), acceptance document on Slovakia's acceptance was stored on 26.02.2010.

As part of the multi-factorial cooperation, representatives of the ministry took an active part in workshops at multilateral conventions in the area of the environment that bind the Slovak Republic; special attention can be given in this respect to the meeting of the signatories to the UN Framework Convention on climate change that took place in Cancun in December 2010. Slovakia has taken an active part in the preparation of the EU Strategy for the lower Danubian region that in its position of horizontal strategy reaches into a number of areas. The strategy is expected to create a mechanism of joint responsibility of countries within the Danube region for the economic and social development of their territories and preserving their natural and cultural heritage.

• UP-TO-DATE OVERVIEW OF SLOVAKIA'S MEMBERSHIP IN INTERNATIONAL ENVIRONMENTAL CONVENTIONS

Conventions in the area of air protection

- **Convention on Long-Range Trans-boundary Air Pollution, the so-called "Geneva Convention"** (Geneva, 13/11/1979, ČSFR acceded in 1984, succeeded by Slovakia on 28/05/1993)
  - Protocol to the Convention on Long-Range Transboundary pollution of 1979, on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) (Geneva, 28/09/1984, Slovakia succeeded on 28/05/1993)
  - Protocol to the Convention on Long-Range Transboundary pollution of 1979, on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30% (Helsinki, 18/07/1985, Slovakia succeeded on 28/05/1993)
  - Protocol to the Convention on Long-Range Transboundary pollution of 1979, on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30% (Helsinki, 31/10/1988, Slovakia succeeded on 28/05/1993)

- Protocol to the Convention on Long-Range Transboundary pollution of 1979, on Further Reduction of Sulphur Emissions (Oslo, 14/06/1994, signed on 14/06/1994, ratified on 15/01/1998, in effect since 05/08/1998)
- Protocol to the Convention on Long-Range Transboundary pollution of 1979, on Heavy Metals (Aarhus, 24/06/1998, signed on 24/06/1998, adopted on 30/12/ 2002)
- Protocol to the Convention on Long-Range Transboundary pollution of 1979, on Persistent Organic Pollutants (Aarhus, 24/06/1998, signed on 24/06/1998, adopted on 30/12/ 2002)
- Protocol to the Convention on Long-Range Transboundary pollution of 1979, concerning the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes (Geneva, 18/11/1991, Slovakia succeeded on 15/12/1999)
- Protocol to the Convention on Long-Range Trans-Boundary air pollution to abate acidification, on Reducing Eutrophication and Ground-level Ozone (Göteborg, 30.11.1999, SR signed on 1.12.1999, SR ratified on 28.4.2005)

- **UN Framework Convention on climate change (UNFCCC0** (New York, 09/05/1992, signed 19/05/1993, ratified 25/08/1994, in effect since 23/11/1994)
  - Kyoto Protocol (Kyoto, 11/12/1997, signed 26/02/1999, ratified 31/05/2002)
- **Convention on the Ozone Layer Protection, the so-called "Vienna Convention"** (Vienna, 22/03/1985, ČSFR acceded in 1990, succeeded by Slovakia on 28/05/1993)
  - Montreal Protocol on ozone layer depleting substances (Montreal, 16/09/1987, ČSFR acceded in 1990, succeeded by Slovakia on 28/05/1993).
  - Montreal supplement to Montreal Protocol on ozone layer depleting substances (Montreal, 17/09/1997, approved by the SR on 03/11/1999)
  - London supplement to Montreal Protocol on ozone layer depleting substances (approved by the SR on 15/04/1994)
  - Copenhagen supplement to Montreal Protocol on ozone layer depleting substances (approved by the SR on 08/01/1998, effective since 07/04/1998)
  - Montreal supplement to Montreal Protocol on ozone layer depleting substances (Beijing, 03/12/1999, approved by the SR on 22/05/2002)
- **Stockholm Convention on persistent organic compounds** (Stockholm, 22/05/2001, ratified by the SR on 05/08/2002)

Conventions in the area of water protection

- **Convention on the Protection and Use of Trans-boundary Watercourses and International Lakes** (Helsinki, 17.03.1992, SR acceded on 07.07.1999)
  - Protocol on water and health (London, May 1999)
- **Convention on cooperation and sustainable use of the River Danube, so-called Danube Convention** (Sophia, 29/06/1994, signed by the SR on 29/06/1994, ratified by the SR on 02/10/1997)

Conventions in the area of nature protection

- **Convention on biodiversity** (Rio de Janeiro, 05/06/1992, signed 19/05/1993, Slovak President signed ratification document on 23/08/1994, ratified 25/08/1994, effective since 24/11/1994)
  - Cartagena Protocol on biodiversity (Montreal, 29/01/2000, SR signed: Kenya, 24.5.2000, ratified on 24/11/2003)
- **Convention on the protection of free living organisms and natural habitats, so-called Bern Convention** (Bern, 19/09/1979, signed by the SR on 28/04/1994, ratified 23/09/1996, effective since 01/01/1997)
- **Convention on Wetlands of International importance, especially as aquatic birds habitats, so-called Ramsar Convention** (ČSFR acceded 02/07/1990, effective since 02/07/1990, SR succeeded on 31/03/1993)
- **Convention on the Conservation of Migratorz Species of Wild Animals, so-called Bonn Convention** (Bonn, 23/06/1979, SR acceded 14/12/1994, effective since 01/03/1995)
  - Agreement on the Conservation of Bats in Europe of 04/12/1991 (SR acceded on 09/07/1998)
    - Supplement no. 2 to the Agreement on the Conservation of Bats (Bristol, 24 - 26 July 2000), document on approval by the SR was stored on 26/02/2010.
  - Agreement on the Conservation of African-Eurasian species of migrating waterfowl (Haag, 15/08/1996, document on accession with condition stored 13/04/2001)
- **Convention on International Trade in Endangered Species of Wild Fauna and Flora, so-called Washington Convention - CITES** (ČSFR acceded on 28/02/1992, effective since 28/05/1992, succeeded by SR in 1993)
- **Convention Concerning the Protection of the World Cultural and Natural Heritage** (ČSFR acceded on 15/11/1990, effective since 15/02/1991, succeeded by SR in 1993)
- **International Convention for the Regulation of Whaling** (Washington, 2.12.1946), and **Protocol of Amendment** (Washington, 19.11.1956) Document on the SR accession stored on 22/03/2005)
- **European Landscape Convention** (Florence, 20.10.2000, SR ratification protocol stored on 9.8.2005)

Cross-sectional Conventions

- **UN ECE Convention on Environmental Impact Assessment in a transboundary context** (Espoo 25/02/1991, ČSFR signed 25/02/1991, succeeded by the SR in 1993, ratified by the SR on 18/11/1999)

  Supplement 1 and **supplement 2** to the convention (document on approval by the SR on 29/05/2008)
  - Protocol on strategic environmental assessment (Kiev, 21/05/2003, signed by the SR on 19/12/2003, ratified by the SR on 29/05/2008)

- **Convention on Control of Transboundary Movement and Management of Hazardous Wastes and Their Disposal, so-called Basel Convention** (Basel, 22/03/1989, ČSFR acceded in 1991, succeeded by the SR on 28/05/1993**,** adoption of Supplement to Convention on 11/09/1998) **Supplement** to the Basel Convention (New York 22/09/1995, document on adoption by the SR stored 11/09/1998)
- **Convention on the transboundary effects of industrial accidents** - (Helsinki, 17/03/1992, document on accession of the SR on 09/09/2003)
- **Framework Convention on the Protection and Sustainable Use of the Carpathians - Carpathian Convention** (Kiev, adopted 22/05/2003, document on approval stored 06/05/2004)
  - Protocol on the conservation and sustainable use of biological and landscape diversity to the Framework Convention on the Protection and Sustainable Use of the Carpathians
- **Convention on Access to information, public participation and access to justice in environmental matters – Aarhus Convention** (Aarhus, 25/06/1998, SR accession document stored on 05/12/2005)

  Changes and amendments to the Convention (Almaty, 27/05/2005, document on ratification by the SR stored on 01/04/2008)
  - Protocol on the register of release of polluting substances and their fluxes (PRTR Protocol) (Kiev, 22/05/2003, document on accession by the SR stored on 01/04/2008)
- **Convention for the establishment of a European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)** (Geneva, May 24, 1983, document on the accession of Slovakia registered on January 3, 2006)
- **Protocol on the privileges and immunities of the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT**) (Darmstadt, June 5, 1986, document on the accession of Slovakia stored on January 24, 2006)

ALPHABETICAL LIST OF ABBREVIATIONS

AL	Arable Land
AMS	Automated Monitoring Stations
AOT40	Accumulated Dose Over a Threshold of 40 ppb
AST	Agrochemical Soil Testing
ATaTI	Agriculture Technical and Testing Institute
BOD_5	Biochemical Oxygen Demand
Bq	becquerel
BR	Biosphere Reserve
CCTIA	Central Controlling and Testing Institute in Agriculture
CHF	Swiss Franks
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
CM	Cultural Monument
COD_{Cr}	Chemical Oxygen Demand by Dichromade
COD_{Mn}	Chemical Oxygen Demand by Permanganate
Coll.	Collection of Laws
CR	Critically Endangered Taxon
ČSFR	Czechoslovak Federative Republic
CU OP	Central Europe Operational Programme
D.U.	Dobson Units
DD	Data Deficient Taxon
DMC	Domestic Material Consumption
EAP	Environmental Action Programme
EC	European Commission / European Community
Ed	Endemic Taxon
EEA	European Environmental Agency
EEC	European Economic Community
EEC FM	European Economic Area Financial Mechanism
EFTA	European Free Trade Association
EI	Energy Intensity
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
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
FSC	Forest Stewardship Council
GBO	Global Biodiversity Outlook
GCCA SR	Geodesy Cartography and Cadastre Authority of the Slovak Republic
GDP	Gross Domestic Product
GEF	Global Environment Facility
GEIC	Gross Energy Inland Consumptin
Gg	Greenhouse Gases / Giga Grams of CO_2
GHGs	Greenhouse Gases
GMO	Genetically Modified Organisms
GPP	Green Public Procurement
ha	Hectare
Inc.	Incorporated
Inc.	Incorporated
IPI	Industrial Production Index
IS	Insoluble Substances

ISO	International Organization for Standardization
IUCN	The International Union for the Conservation of Nature and Natural Resources
JAVYS, Inc.	Nuclear and Decommissioning Company, Inc.
KP	Kyoto Protocol
KURS 2001	The Conception of Spatial Development of Slovakia 2001
LA	Loaded Area
LR	Lower Risk Taxon
LRW FTF	Liquid RAW Final Treatment Facility
Ltd.	Limited corporation
LULUCF	Land Use-Land Use Change and Forestry
MaB	Man and the Biosphere Programme
MB SR	The Monuments Board of the Slovak Republic
MDA	Minimum Detectable Activity
MGF	Monitoring of Game, Wildlife, and Fishes
MoARD SR	Ministry of Agriculture and Rural Development of the Slovak Republic
MoC SR	Ministry of Culture of the Slovak Republic
MoE SR	Ministry of Environment of the Slovak Republic
MoTCaRD SR	Ministry of Transport, Construction and Regional Development of the Slovak Republic
MR	Monument Reserve
MW	Municipal Waste
NAP GPP	National Action Plan for Green Public Procurement
NC SR	National Council of the Slovak Republic
NCM	National Cultural Monument
NE	Not Evaluated Taxon
NES_{UV}	Non-polar Extracting Substances
NFC	National Forest Centre
NFM	Norwegian Financial Mechanism
NM	Nature Monument
NM VOC	Non-Methane Volatile Organic Compounds
NNM	National Nature Monument
NNR	National Nature Reserve
No.	Number
NP	National Park
NPEHOV	National Programme of Environmental Assessment and Ecolabelling
NR	Nature Reserve
NRFB	Non-refundable Financial Benefit
NRWR	National Radioactive Waste Repository
OECD	Organization for Economic Co-operation and Development
OP SEE	Operational Programme South-Eastern Europe
OPE	Operational Programme Environment
PA	Protected Area
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
pcs	Pieces
PEFC	Programme for the Endorsement of Forest Certification Schemes
PG	Permanent Grassland
pH	Acidity in pH
PLA	Protected Landscape Area
PLF	Protected Landscape Fragment
PM_{10}	Particulate Matter between 2.5 and 10 micrometers in size
$PM_{2,5}$	Particulate Matter to 2.5 micrometers in size
PMA	Permanent Monitoring Areas
PMS	Partial Monitoring System
PMS-S	Partial Monitoring System - Soil
POPs	Persistent Organic Pollutants
PS	Protected Site
pSCI	Proposed Sites of Community Importance
pSPA	Proposed Special Protected Area
PZ	Protective Zone

RAW	Radioactive Waste
SCI	Sites of Community Importance
SE, Inc.	Slovak Energy, Inc.
SEA	Slovak Environmental Agency
SEA	Strategic Impact Assessment
SFA	Slovak Fishing Association
SGI	Slovak Geological Institute of Dionyz Stur
SHMI	Slovak Hydrometeorological Institute
SK NACE	Revised classification of economic activities
SNC SR	State Nature Conservancy of the Slovak Republic
SNF	Spent Nuclear Fuel
SO SR	Statistical Office of the Slovak Republic
SPA	Special Protected Area
SPM	Suspended Particulate Matter
SPP, Inc.	Slovak Gas Industry, Inc.
SR	Slovak Republic
SSCRI	Soil Science and Conservation Research Institute
SSPA	Small-size Protected Areas
TANAP	Tatras National Park
UN	United Nations
UNEP	United Nations Environment Programme
UNESCO	The United Nations Educational, Scientific and Cultural Organization
UNFCCC	UN Framework Convention on Climate Change
V4	Visegrad group (4 Central European Countries: Czech Rep., Slovakia, Hungary, Poland)
VOC	Volatile Organic Compounds
VU	Vulnerable Taxon
WEEE	Waste from Electrical and Electronic Equipment
WH	World Heritage
WWTP	Waste Water Treatment Plants

CONTENT