FOREWORD

Few people today realize that the environment is a conditioning factor for the existence of each one of us. All of its components and ecosystems influence its trend. Their situation today is changing not only within the local and regional scope, but also at the global level. Several places have shown improved quality of the environment thanks to building the environmental infrastructure. Through implementing legal, educational, economic, organisational, and other instruments we have been trying to increase environmental safety, appropriateness, loading capacity, usability, and aesthetics. These include also building flood protection facilities in areas with the highest risk of floods in Slovakia. The world is facing environmental threats of global magnitude. These include, for example, impacts provoked by the changed climate or gradual depletion of selected strategic natural resources. All of this occurs also in consequence of a continuing rise in the world´s population that exceeded the number of seven billion people. In many countries, this has spurred phenomena such as starvation, poverty, devastation of land and marine ecosystems, reduction of biodiversity, excessive exploitation of minerals, and enormous air pollution, water contamination and environmental pollution by waste.

The UN Conference for sustainable development - RIO + 20 organized in Rio de Janeiro in 2012 addressed the already mentioned as well as other issues. The Conference hosted also the Slovak delegation. This global conference of the highest rank analysed the possibilities of reducing the impacts of adverse environmental situation in social and economic aspects and proposed measures for its improvement and for securing sustainable development. Following the global RIO+20 conference, the European Union prepared its 7th Environmental Action Plan by 2020 (7. EAP) as its basic strategic document. The document aims mainly at improving air quality, staying within the limit values for pollution, flood protection, and other environmental catastrophes, as well as better effectiveness of waste management, etc. This programme called "Good life within the possibilities of our planet" focuses mainly on supporting the funding of those sectors of environmental protection which act as prevention or which eliminate the negative phenomena and acute national environmental risks, or increase environmental safety, appropriateness, and usability, especially through increased protection and more rational use of the components of the environment, natural heritage, natural resources. Priorities of the 7th EAP include protection of the EU population against the environmental pressures and risks that pose threat to its health or wealth, together with perfecting the knowledge base for the environmental strategy. These and other EU objectives are in line with the Programme declaration of the Slovak Government for the years 2012 – 2016 with an outlook to 2020 (approved by the Resolution of the Slovak Government No. 144/2012 and the Slovak National Council Resolution 24/2012) especially in its part titled: "Environmental care". Many environmental measures are included also in other chapters dealing with social stability and securities for people, sustainable economic development, knowledge society, education and culture, development of the regions of Slovakia, and quality of life as a result of cohesive society.

Slovak Ministry of Environment in its new sectoral national environmental strategy outlined the environmental objectives of the mentioned programme declaration of the Slovak government. This strategy builds on the assessment of the environmental situation in Slovakia from the European and

global perspective. At the same time, it represents documentary basis for drafting "Quality of Environment Operation Programme for the years 2014 - 2020". The Strategy was approved on March 28, 2013 and titled: "Orientation, principles, priorities, and major tasks in the environmental care in the Slovak Republic for the years 2014 - 2020". The Strategy sets out 8 basic roadmap objectives of the national environmental strategy, along with its 10 principles, 7 priorities, and 85 major tasks. The seventh strategic priority supports environmental formation and education, science, research and development, environmental monitoring, and information science, and voluntary instruments of the environmental strategy. Publication of the twentieth report on the state of the environment in 2012 within its seventh priority follows up the sectoral national environmental strategy. This report on the state of the environment differs from its previous version in that it adopts a broader approach to the process of environmental situation assessment in Slovakia since the start of its monitoring, and provides a more detailed comparison between the environmental indicators among the neighbouring and other EU member countries.

The year 2012 is considered a breakthrough year in the environmental care not only in the world and Europe, but also here in Slovakia. We are looking back over its twenty-year history and outlining a new route for our environment with the conviction that we will be able, through a common effort, reach all the environmental goals by 2020. Thus we will create more favourable initial conditions for improving the environment, building a knowledge society, and securing sustainable development and green growth in the Slovak Republic and the whole European Union by 2050 and for the rest of the 21st century.

Ing. Peter Žiga, PhD.
Minister of Environment of the Slovak Republic

COMPONENTS OF THE ENVIRONMENT AND THEIR PROTECTION

• AIR

Key questions and key findings

What is the recent trend in the area of production of polluting substances in the Slovak Republic?

- **Basic pollutant emissions (PM, SO_2, NO_X, CO) over a long-term horizon (1993 - 2011) have been consistently declining; however, the speed of decline 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 until 2009. Positive year-to-year change was recorded in SO_2 and NO_X, on the contrary, PM and CO emissions showed a rising trend over the last year.**
- **Ammonia emissions have been persistently decreasing over a long time period.**
- **Non-metal volatile organic compounds (NMVOC) emissions over a longer time horizon (1993 - 2000) have been decreasing persistently. In the period of 2000 to 2010 the values were maintained more-less at the same level, with slight fluctuations in specific years. Growth in NMVOC emissions in 2011 (compared to 2010) was mostly influenced by increased volumes of solvents production and purchase.**
- **Persistent organic pollutants (POPs) emissions declined significantly over the period of 1993 - 2000. When the years 2000 and 2011 were compared, there was seen a decline in PCDD/PCDF emissions by 52.8%; however, PCB emissions increased by 1.9%, and the sum of PAH emissions increased by 42.6%. From year to year, PCDD/PCDF emissions show declining values. The same trend is seen in PCB. On the contrary, other PAH emissions show a slight increase.**

Is Slovakia fulfilling its obligations given by international conventions in the area of air protection?

- **Slovakia is fulfilling its obligations given by international legislation in the area of air protection.**

Are the air pollutants limit values for human health protection complied with?

- **Notwithstanding the persistent decrease in the pollutants emission, in 2012 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.**

Are the air pollutants limit values for vegetation protection complied with?

- **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.**
- **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 2012 remained at a relatively high level achieved in the previous years.**

What has been the trend in the condition of the ozone layer and intensity of solar radiation over the SR territory?

- **Total atmospheric ozone was above the long-term average values, within a 5.4% deviation above the mean value; total sum of daily doses of the ultraviolet erythema radiation decreased.**

Is the SR fulfilling its international obligations in the area of the Earth's ozone layer protection?

- **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.

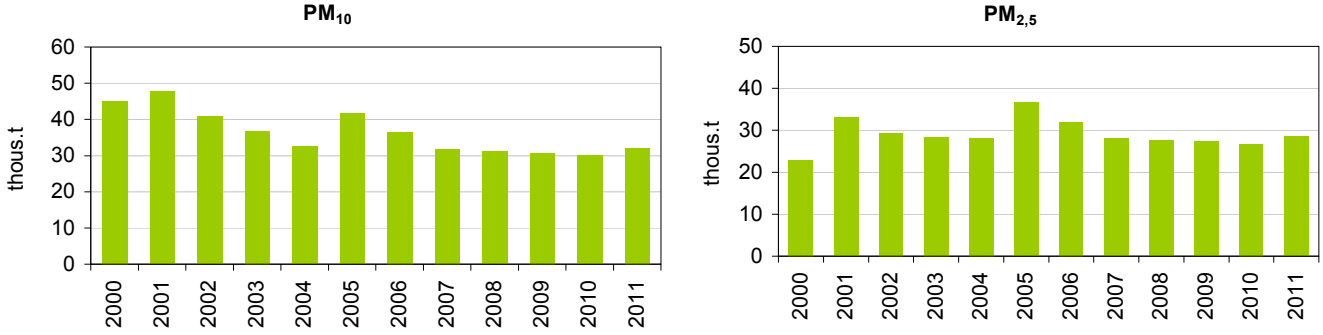
Increase in the PM emissions over 2004-2005 was caused by an increased consumption of wood within the sector of small-size sources (heating up of houses) due to increased natural gas and coal prices for small consumers. Reduction in the PM emissions in 2006 was caused mainly by reconstructions of the 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.

Slight increase in PM emissions in 2011 was recorded in the sector of small-sized sources - households with increased consumption of firewood at the expense of natural gas.

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



Source: SHMI

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.

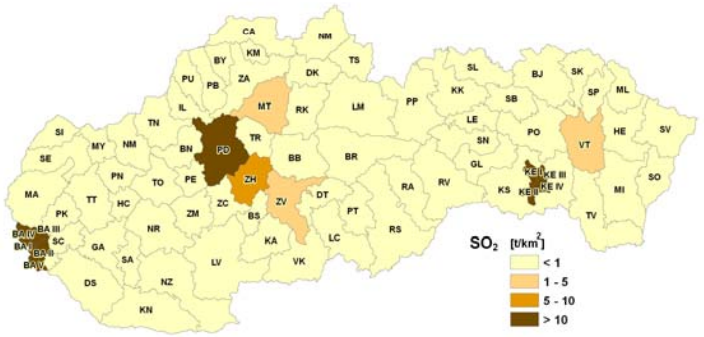
This reduction also relates to the modernisation of personal and freight vehicles, as well as the use of a more exact emission factor and it was the most important factor influencing emissions drop in 2011.

Trend in carbon monoxide emissions

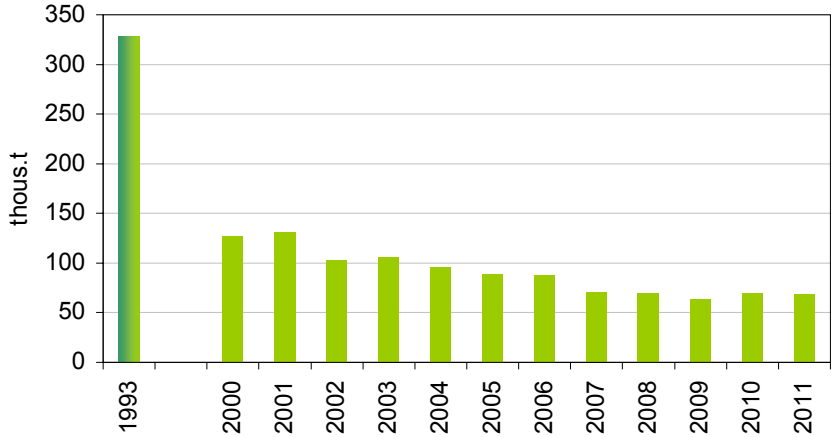
Carbon monoxide emissions (CO) since 1990 have shown a falling tendency, which was caused mainly by reduced consumption and change in fuel composition in the sphere of retail consumers. CO emissions from large sources were decreasing only slightly. The most significant share on CO emissions from large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

The decrease in CO emissions since 1996 was due to the effects of policy and measures (determined on the results of measurements) to reduce CO emissions from the most significantly sources. The emission trend changes of CO within 1997 and 2003 is also affected by the quantity of pig iron production as well as the fuel consumption. In 2004 the CO emissions slightly increased mainly at large sources (the CO emissions specified by continuous measurement in U.S. Steel Ltd., Košice), since then the emissions have had only moderately decreasing trend. In 2005 the decrease of CO emissions was announced atlarge sources too, mainly as a consequence of agglomerate production cutting down in U.S. Steel Ltd., Košice and by the implementation of a new technology with effective combustion at lime production (Dolvap Ltd., Varín). Significant decrease (22%) in CO emissions of major sources in 2009 was mainly due to decrease in iron and steel production as a result of economic recession. Increase of CO emissions was achieved only in the sector of small sources (residential heating) and it is related to the increase of wood consumption caused by the increasing price of natural gas and coal. The emission decrease in the sector road transport is associated with onward renovation of rolling stock by the generationally new vehicles equipped by the three-way catalysts. Emissions in year 2010 increased (about to the level of year 2002) due to increased production of iron and steel in facility U.S. Steel s.r.o., Košice. increase in CO emissions continued in 2011 but still below the level in the years 2004 to 2006, when emissions were the highest during the decades.

Element regional emission of SO_2 in 2011 ($t.km^{-2}$)

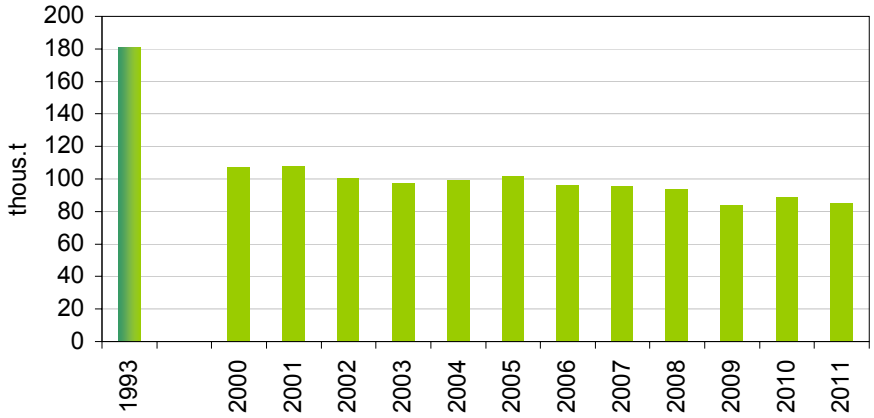


Trend in emission of SO_2

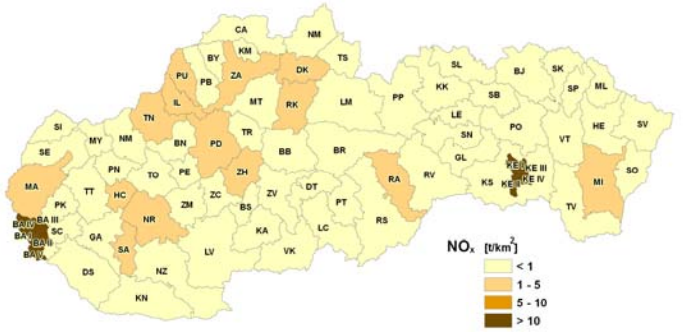


Source: SHMI

Trend in emission of NO_X

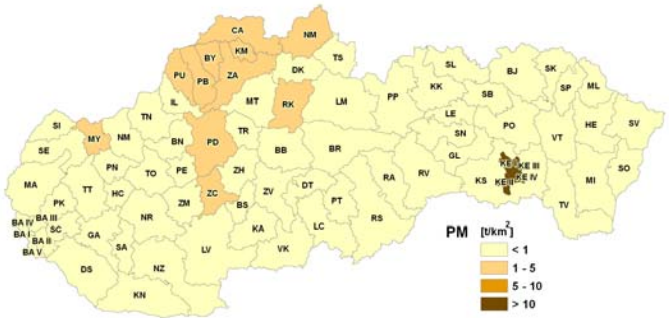


Element regional emission of NO_X in 2011 ($t.km^{-2}$)

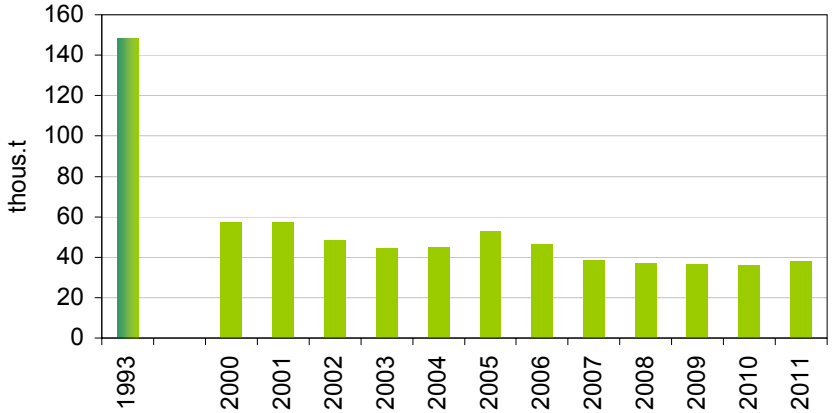


Source: SHMI

Element regional emission of PM in 2011 (t.km^{-2})

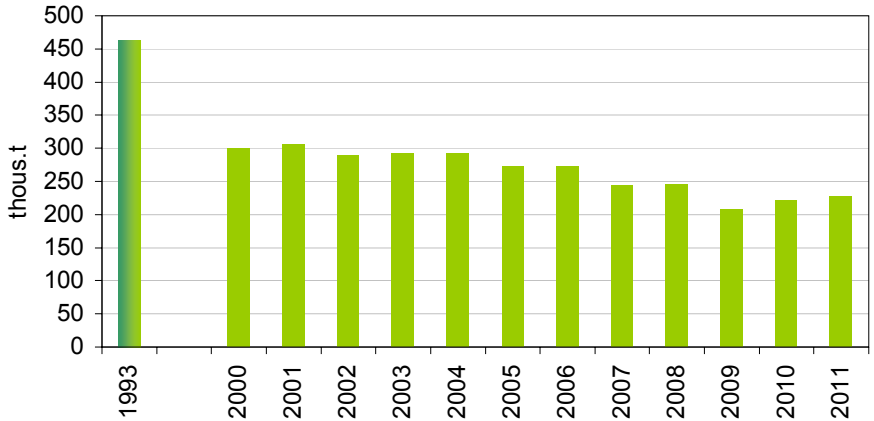


Trend in emission of PM

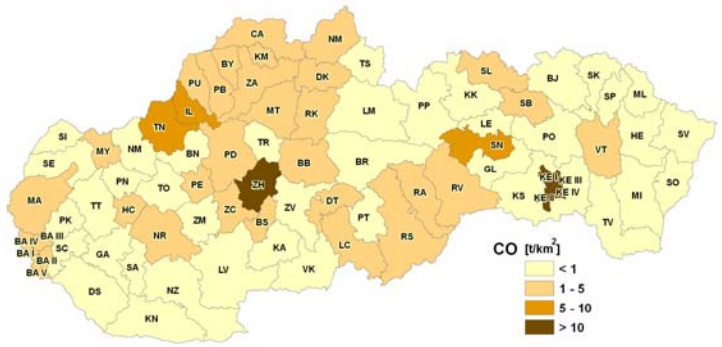


Source: SHMI

Trend in emission of CO



Element regional emission of CO in 2011 (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

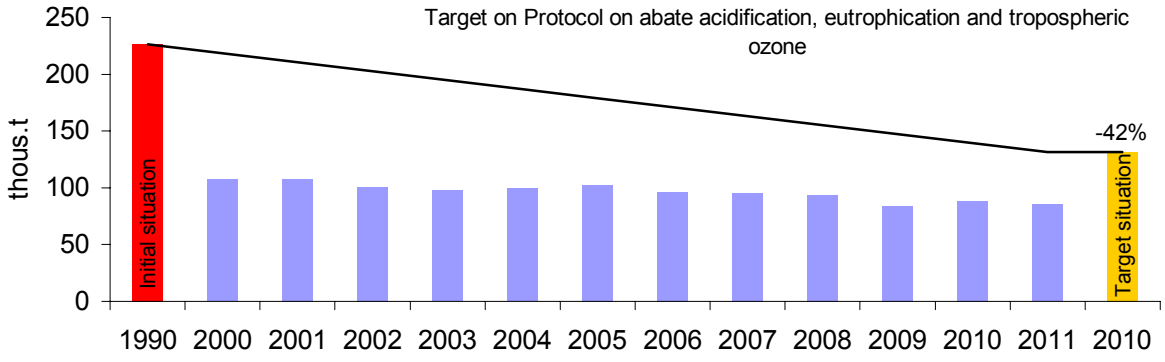
Year	1980 (initial year)	2000	2005	2010
SO_2 emission (thous. t)	843	337	295	236
SO_2 emission reduction (%)	100	60	65	72

Slovakia met one of its Protocol objectives to reduce the SO_2 emissions in 2000 by 60%, in 2005 by 65% and in 2010 by 72%, compared to the reference year of 1980. In 2000, sulphur dioxide emissions reached the level of 126.953 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 2010, sulphur dioxide emissions reached the level of 63.393 thousand tons, which is 92% less than in 1980. The year 2011 shows a positive trend.

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

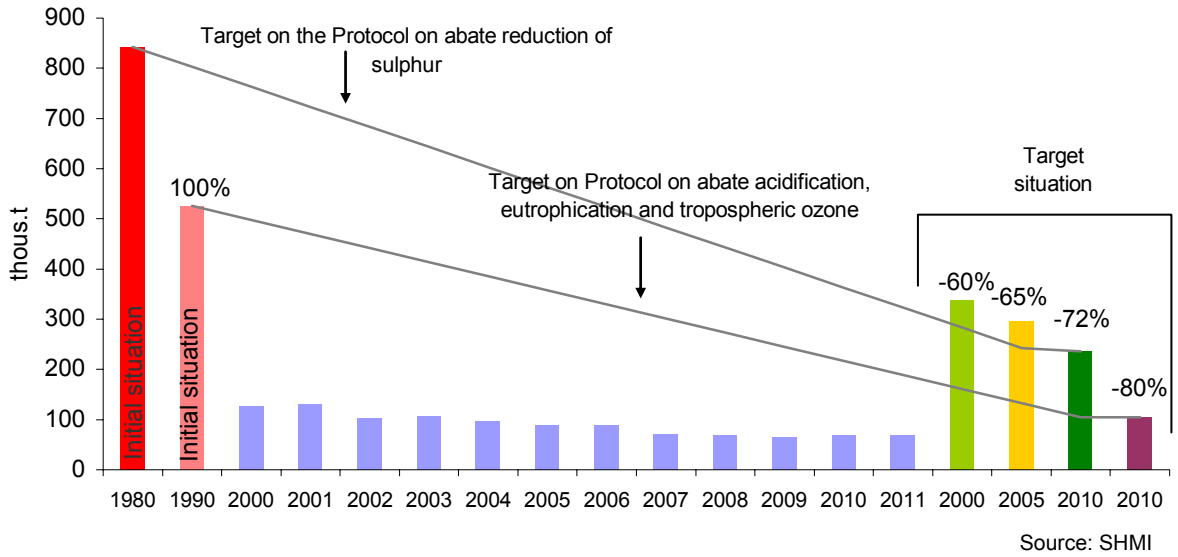
The protocol was signed in Göteborg in 1999. Slovakia signed the protocol in 1999 and ratified in 2005. Slovakia obliged itself to reduce the SO_2 emissions by 2010 by 80%, the NO_2 emissions by 2010 by 42%, the NH_3 emissions by 2010 by 37% and the VOC emissions by 2010 by 6% in comparison to the year 1990. As to date, the Slovak Republic achieved the set objective and continues in the same trend.

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



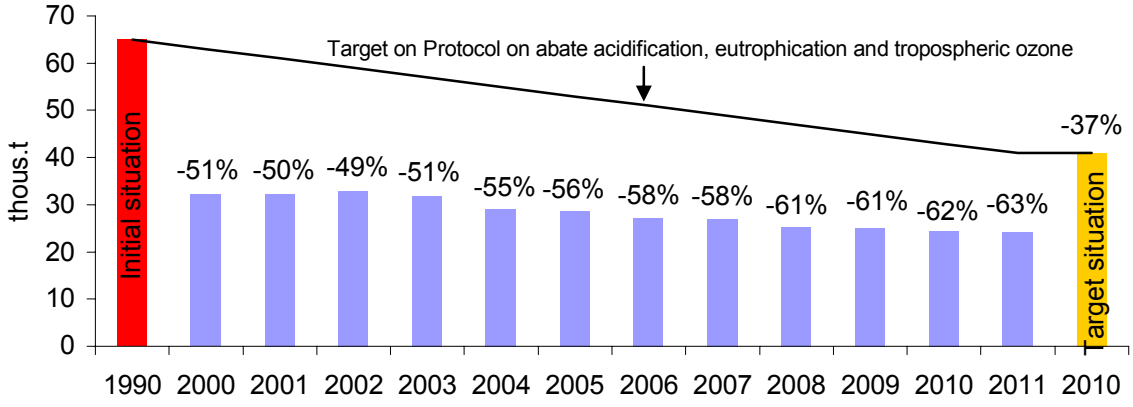
Source: SHMI

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

Production of the NH_3 emissions$_3$ in 2011 was 24 184 tonnes. More than 95% 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.

Over a long-term period, there is a persistent decrease in total volumes of NH_3 emissions.

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



Source: SHMI

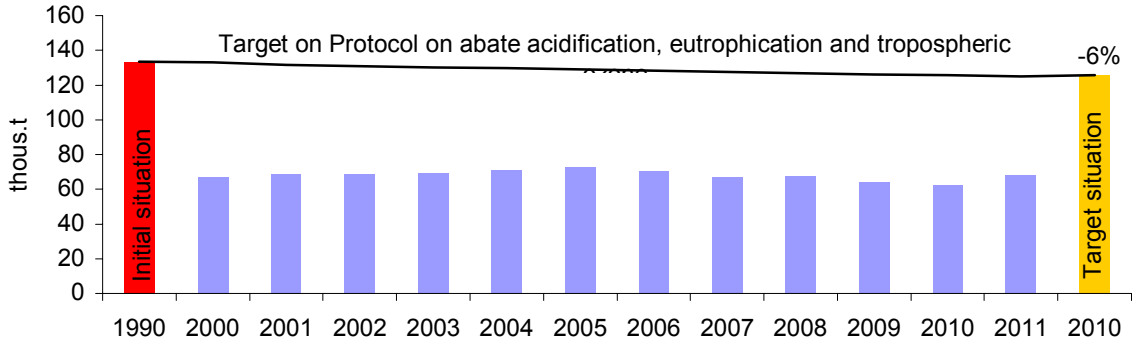
- **Emissions of non-methane volatile organic compounds**

Non-methane volatile organic compounds (NMVOC) are set in compliance with the requirements of the international methodology of EMEP/EEA. (Air Pollutant Emission Inventory Guidebook) Since 2001, inventories of NMVOC emissions have been included also emissions balance

from asphalting roads which resulted in adequate increase in total emissions in individual years. Emission factor used for the calculation of emissions from given sector was revised and changed in 2004. As for the sector of burning by households, emissions have increased slightly due to burning wood. In the sector of fuel distribution, emissions from LPG distribution was introduced since 2001.

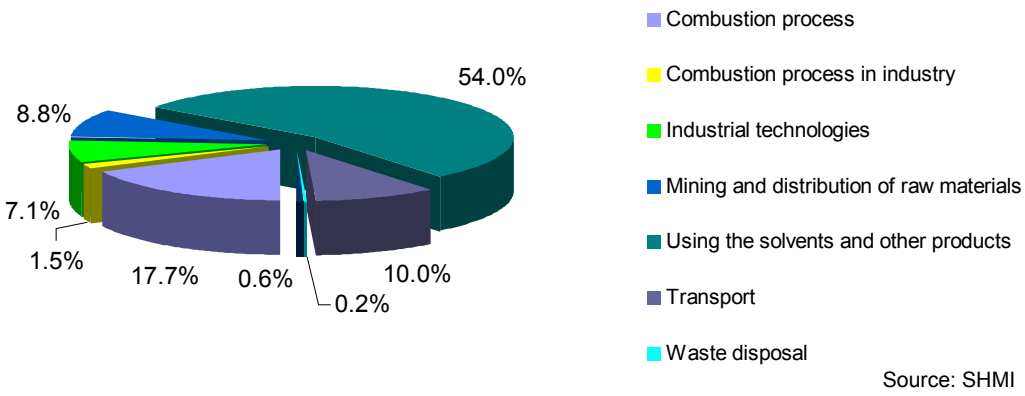
Decline in total NMVOC emissions was caused by a number of measures, such as reduction in using coating compounds and by gradual introduction of low-solvent types of coatings, extensive introduction of measures in the sector of crude oil processing and fuel distribution, introduction of gas technologies 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 came into effect **Council Directive 1999/13/EC of 11 March 1999 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations** which obliged the operators to comply with the emission limits. In 2007, data over the entire time progression in the sector of chemical cleaning and degreasing were recalculated. In 2008, the entire time progression in the sector of waste land-filling and incineration was recalculated on the basis of the updated input data. Similarly, emissions from road transport were also recalculated due to the use of an updated version of COPERT IV model. In 2009, there was a decline in NMVOC emissions related to decreased industrial production. Emissions from road transport were recalculated as back as to 1990 due to the use of a newer version of the COPERT IV model in the inventory. Until the year 2010, trend in NMVOC emissions showed reducing values. In 2011, there was recorded a slight increase with total volume of NMVOC emissions reaching the volume of 68,285.859 tonnes.

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



Source: SHMI

The contribution of the NMVOC emission according to sector of their origin in 2011



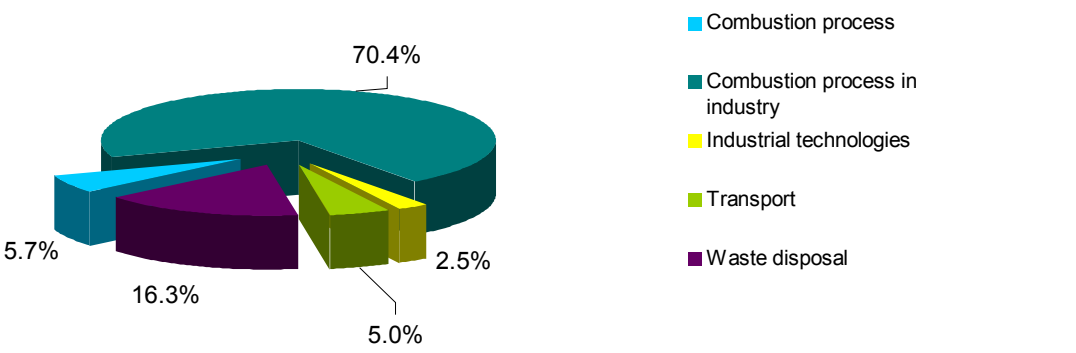
Source: SHMI

- **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. Decrease in emissions of heavy metals in 2011 is affected by the decline of production in the industrial sector.

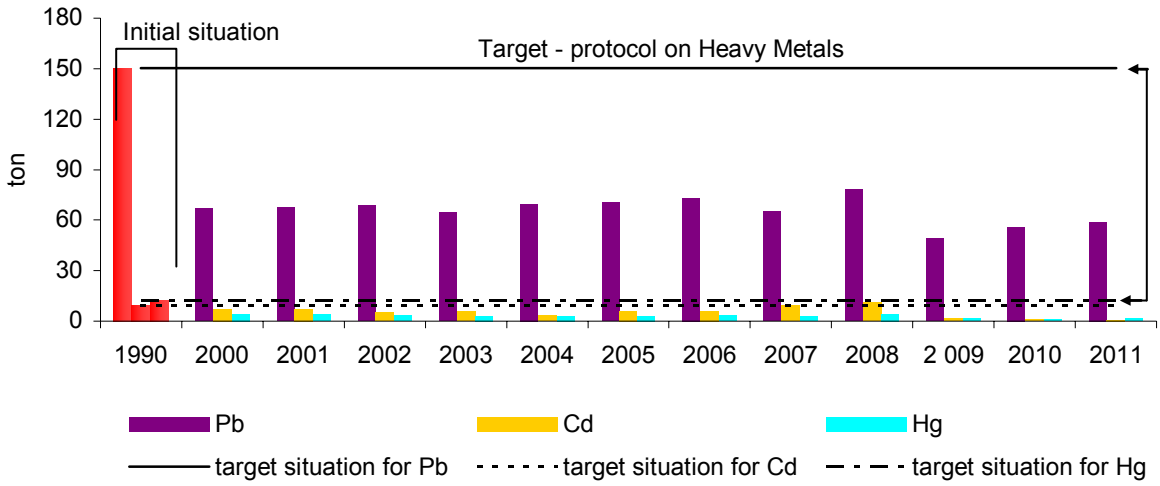
The contribution of the particular sectors in the Pb emission production for year 2011



Source: SHMI

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

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



Source: SHMI

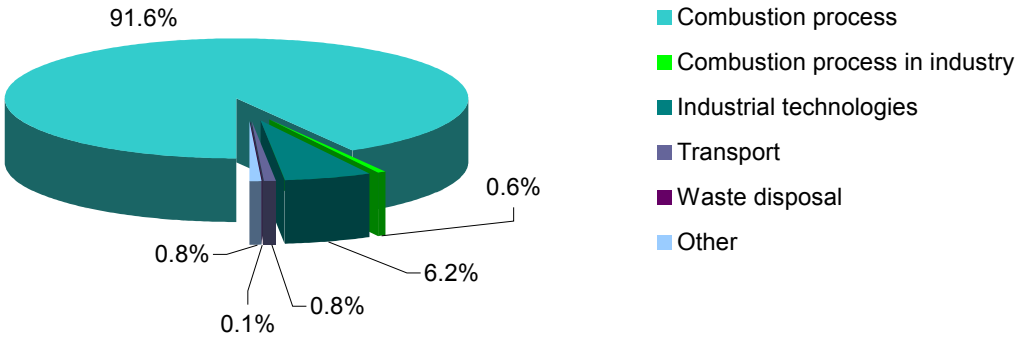
- **Balance of Persistent organic pollutants (POPs)**

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.

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.

In 2012, emissions from road transport were recalculated.

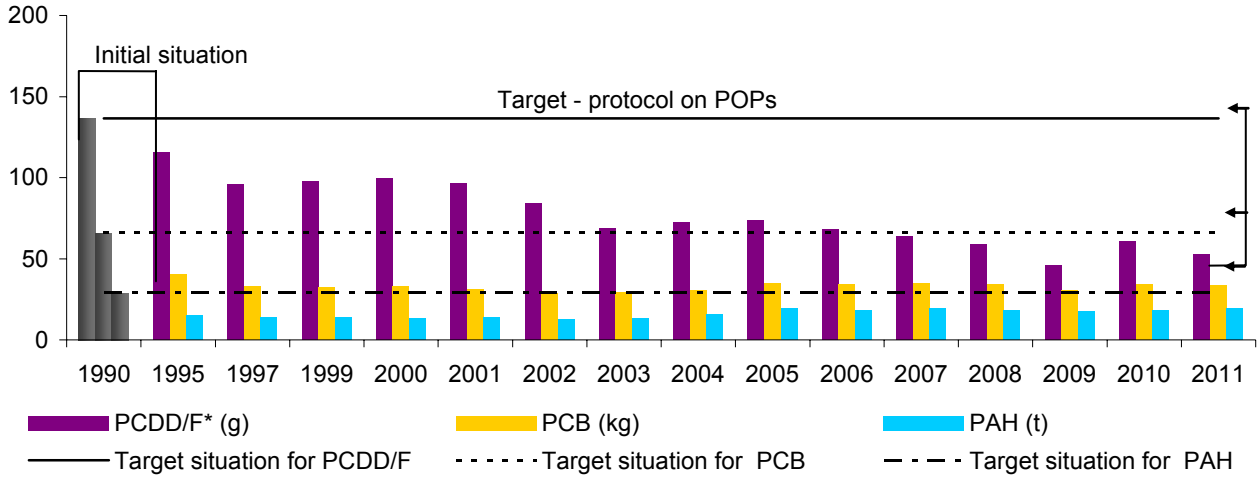
The contribution of the particular sectors in the PAH emission production for year 2011



Source: SHMI

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

Trend of POPs emissions regarding the fulfilment of the international conventions



Source: SHMI

Air pollution

♦ Air quality and its limits

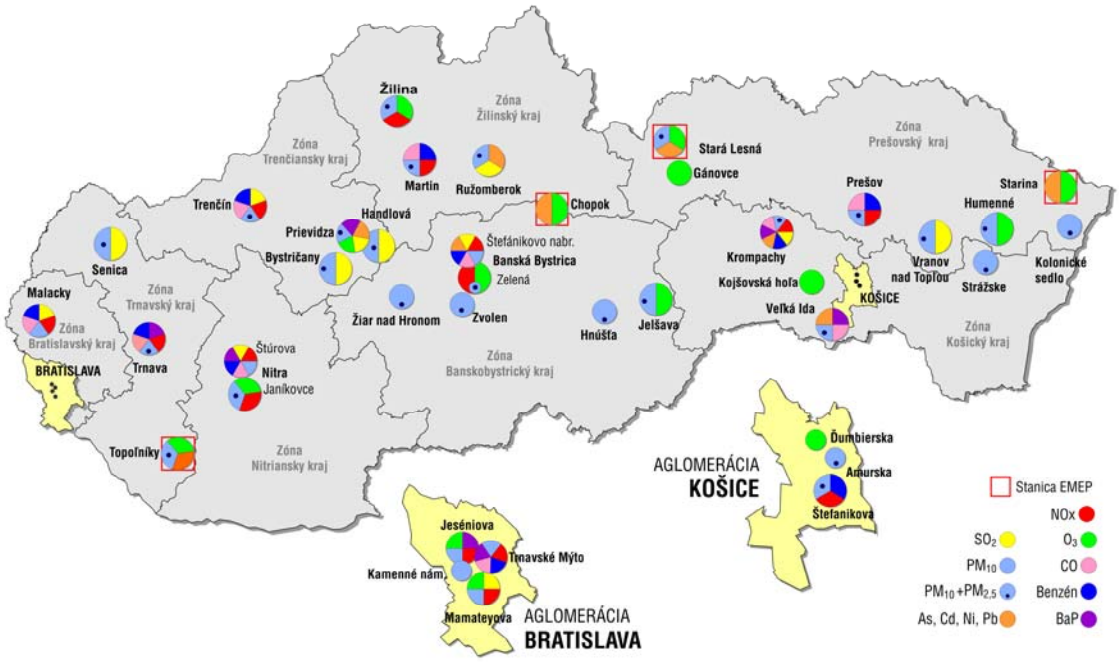
Air quality in general is determined by the contents of airborne pollutants in the upper atmosphere, Air quality assessment has been implemented in **compliance with Act 137/2010 Coll. on air.** Air quality criteria (limit and end values, tolerance thresholds, upper and lower assessment thresholds, and others) are published in **Decree of the Ministry of Environment No. 360/2010 Coll. on air quality.** Assessment of air quality in Slovakia is based on the outcomes of airborne pollutants' concentrations measurements by the Slovak Hydrometeorological Institute at the stations within its National Air Quality Monitoring Network. (NAQMN)

In line with regulations of the act 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:

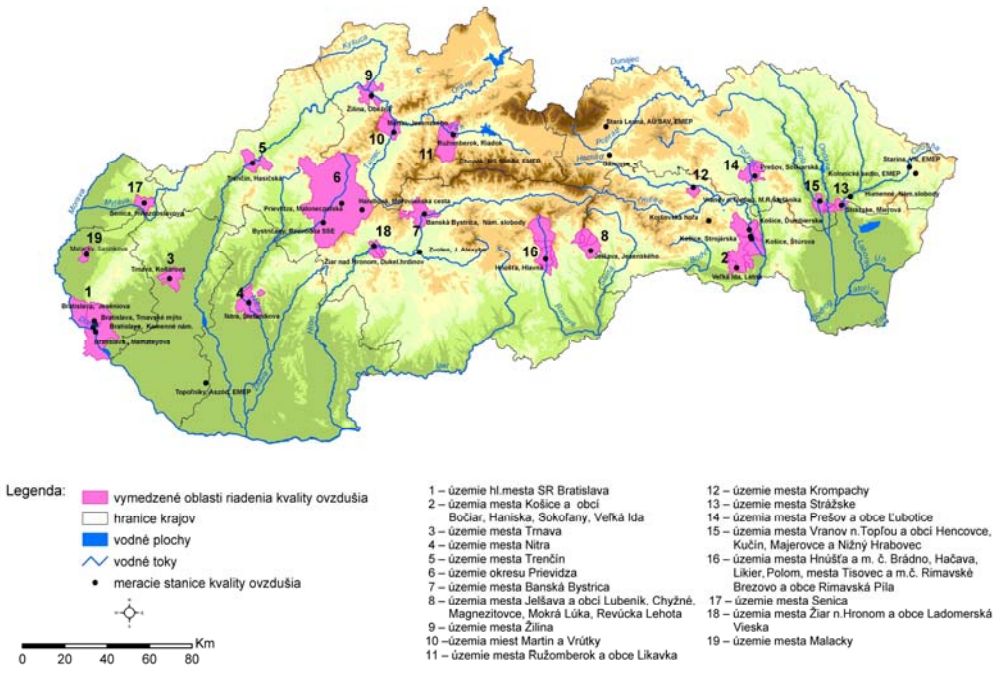
- limit values for one substance or more pollutants increased by tolerance threshold,
- limit value of one substance or more pollutants, if no tolerance threshold is set,
- target value for ozone, $PM_{2,5}$, arsenic, cadmium, nickel, or benzo(a)pyrene.

National monitoring air quality network – 2011



Source: SHMI

Air quality management areas



Source: SHMI

♦ Local Air pollution

Sulphur dioxide

Minimum range of SO_2 monitoring (number and localisation pursuant to Annex 5 to Decree 360/2010 Coll. on air quality) has not been achieved due to lacking measurements in the agglomeration of Košice. Monitoring of sulphur dioxide has been carried out through continual reference method at 12 stations. Required number of valid measured data (90%) was achieved at 7 monitoring stations. No limit values were exceeded in 2012.

Nitrogen dioxide

Minimum range of NO_2 monitoring (number and localisation pursuant to Annex 5 to Decree 360/2010 Coll. on air quality) was achieved. Monitoring of sulphur oxides has been carried out through continual reference method at 15 stations. Required number of valid measured data (90%) was achieved at 9 monitoring stations. In 2012, limit value was exceeded at the monitoring station of Banská Bystrica, Štefánikovo nábrežie.

PM_{10}

Minimum range of PM_{10} monitoring (number and localisation pursuant to Annex 5 to Decree 360/2010 Coll.) has been achieved. PM_{10} monitoring was carried out by equivalent, continual method of oscillation microbalance, by TEOM instruments at 32 stations. Required number of valid measured data (90%) was achieved at 19 monitoring stations.

A number of urban stations implemented equivalence testing through the gravimetric method. Currently, the results are analysed with the objective to have the whole process automated. Also, in 2012, permitted number of measurements with exceeded values at most monitoring sites was exceeded.

$PM_{2.5}$

Range of $PM_{2,5}$ monitoring (number and localisation pursuant to Annex 5 to Decree 360/2010 Coll. on air quality) was achieved. $PM_{2,5}$ monitoring was implemented through the same method as PM_{10} measurements with the use of TEOM instruments at 26 stations. Gravimetric measurements were carried out at one station. As for $PM_{2,5}$ particles, the annual limit of 25 μg/m3 will come into effect as of 01.01.2015, however, this value has been valid since 2010 as the end value that should not be exceeded. Required number of valid measured data (90%) was recorded at 8 monitoring stations and the number of measurements with exceeded values was recorded at 6 stations.

Carbon monoxide

Minimum range of CO monitoring (number and localisation pursuant to Annex 5 to Decree 360/2010 Coll. on air quality) has not been achieved due to lacking measurements in the agglomeration of Košice. Monitoring of carbon monoxide has been carried out through continual reference method at 10 stations. Required number of valid measured data (90%) was achieved at 6 monitoring stations. No limit values were exceeded in 2012.

Benzene

Minimum range of benzene monitoring (number and localisation pursuant to Annex 5 to Decree 360/2010 Coll. on air quality) was achieved. Monitoring of benzene has been carried out through continual reference method at 10 stations. Required number of valid measured data (90%) was achieved at half of the monitoring stations. No limit values were exceeded in 2012.

BaP

The end value that was to be reached by 31. 12. 2012 was in 2011 exceeded at the stations of Veľká Ida-Letná, Krompachy-SNP, and Prievidza-Malonecpalská, and Trnava-Kollárova.

♦ Regional air pollution and atmospheric precipitations

Regional air pollution *is a pollution of a boundary layer of a rural country at a sufficient distance from local industrial and urban sources. The boundary layer of the atmosphere is a mixing layer extending itself from the Earth surface up to a height of about 1 000 m. Residence time of these pollutants in the atmosphere is several days and thus they may be transported in the atmosphere over a distance of several thousand kilometres from the source. Pollutants coming from combustion processes such as sulphur dioxide, oxides of nitrogen, hydrocarbons or heavy metals, play an important role on a regional scale.*

In 2012, Slovakia operated 4 EMEP NAQMN stations for monitoring regional air pollution and chemical composition of precipitation water. All the stations are part of the EMEP network. EMEP represents a programme of cooperation for monitoring and assessment of remote travel of airborne pollutants in Europe under the scheme of UNECE Convention on Long - Range Trans-boundary Air Pollution CLRTAP (Geneva, 1979).

Sulphur dioxide, sulphates

In 2012 regional sulphur dioxide concentrations calculated per sulphur were 0.26 $\mu g.m^{-3}$ at Chopok, and 0.86 $\mu g.m^{-3}$ 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 0.52 $\mu g\ SO_2.m^{-3}$ and Starina 1.72 $\mu g\ SO_2.m^{-3}$) nor for the winter season (Chopok 0.4 $\mu g\ SO_2.m^{-3}$ and Starina 2.6 $\mu g\ SO_2.m^{-3}$). Percentage share of sulphates on total particulate matter mass was 12.1% at Chopok and 13.7% at Starina. Sulphates to sulphur dioxide concentration ratios expressed in sulphur was 0.9 at Chopok and 0.76 at Starina.

Nitrogen oxides, nitrates

Concentration of nitrogen oxides at regional stations expressed in NO_2-N were in 2012 0.81 $\mu g.m^{-3}$ at Chopok and 1.24 $\mu g.m^{-3}$ at Starina. Pursuant to Annex 13 to Regulation no. 360/2010 Coll., critical level for the protection of vegetation is 30 $\mu g\ NO_X.m^{-3}$ for the calendar year. This level was not exceeded over the last calendar year (Chopok 2.67 $\mu g\ NO_X.m^{-3}$ and Starina 4.09 $\mu g\ NO_X.m^{-3}$). Airborne nitrates at Chopok and Starina were detected mainly in their particulate form. Compared to gaseous nitrates, the difference recorded at Starina favours particulate nitrates more than at Chopok.

Despite the fact that gaseous and particulate nitrates are trapped and monitored separately, their sum is expressed in line with EMEP, since their phase distribution depends on atmospheric temperature and humidity. Percentage share of nitrates on atmospheric aerosol was 6.9 % at Chopok and 9 % at Starina. Ratio of total nitrates (HNO_3 + NO_3) to NO_X-NO_2, as expressed in nitrogen, was 0.15 at Chopok and 0.27 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. Table shows average concentrations of the mentioned components (NH_3 and NH_4^+ calculated as per nitrogen) at Starina for the year 2012. For ammonia ions, annual concentration was 0.58 μg $N.m^{-3}$ and their percentage proportion in PM was 5.2 %. For ammonia, the annual concentration is 0.41 μg $N.m^{-3}$ and the ratio of the ammonia ions and ammonium concentration expressed in nitrogen is 1.4.

Ozone

Stará Lesná shows the longest time progression in ozone measurements since 1992. Ozone measurements at Topoľníky, Starina, and at Chopok started in the course of the year 1994. In 2012, the average annual ozone concentration at Chopok 93 $\mu g.m^{-3}$, 59 $\mu g.m^{-3}$ at Topoľníky, 63 $\mu g.m^{3}$ at Stará Lesná, and 60 $\mu g.m^{-3}$ at Starina.

Volatile organic compounds

Volatile organic compounds C2-C6 or the so-called light carbohydrates began at the Starina station in the fall of 1994. Starina belongs to the few European stations listed within the EMEP network, with regular monitoring of volatile organic compounds. The compounds are assessed in line with the EMEP methodology under NILU. Their concentrations range from decimals to several ppb units. However, since October 2008 until mid September 2011, it was impossible to detect VOC due to persistent problems with the operation of a new gas chromatograph installed at Testing laboratory. VOC measurements were resumed on 15. 9. 2011. Nowadays, VOC analyses for 2012 represent the first semester of 2012.

Percentage share of heavy metals in Starina 2011

ethane	ethene	propane	propene	i-butane	n-butane	acetylene	i-pentane	n-pentane	isoprene	n-hexane	benzene
1.804	0.884	0.801	0.205	0.885	0.582	0.364	0.172	0.170	0.034	0.114	0.355

Measurements were resumed on 15. 9. 2011 Source: SHMI

Atmospheric precipitations

- Major ions, pH, conductivity

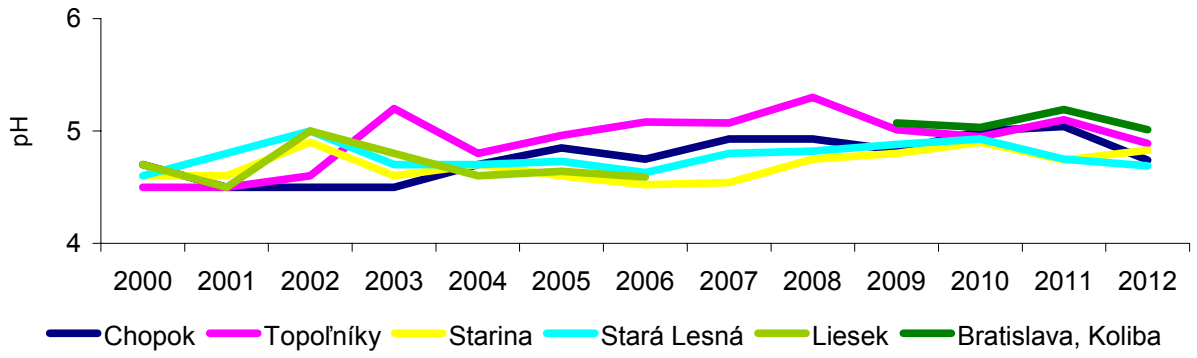
In 2012, total atmopheric precipitations at regional stations were between 432 and 993 mm. Upper limit of the interval was detected at the highest located station Chopok, while the lowest limit was

detected at the station Topoľníky of the lowest altitude. Acidity of atmospheric precipitations was greatest at Stará Lesná, copying the lower pH limit of 4.69 - 4.89. Time progression along with the pH trend over a longer period show a decrease in acidity. pH values well correspond with the pH values by the EMEP maps.

Dominant sulphates concentrations in precipitation water calculated per sulphur represented the interval between 0.41 - 0.55 mg/l. Sulphates concentrations copy the lower interval limit at Topoľníky and the upper limit at Starina. Chopok, Topoľníky, and Stará Lesná differ in the annual average only at a minimum level. Total decline in sulphates concentrations over a long time progression corresponds to a decline in SO_2 emissions since 1980.

Nitrates that contribute to the acidity of precipitations less than sulphates show concentration interval of 0.25 - 0.39 mg/l calculated as per nitrogen. Chopok and Stará Lesná represent the lower limit of the interval, while Topoľníky copies the upper limit. Ammonium ions also belong to majority ions and their concentration span was 0.30 - 0.48 mg/l.

Trend of pH precipitation



Source: SHMI

- Heavy metals in atmospheric precipitations

Since 2000, programme of heavy metals measurement has been gradually modified and more adopted to reflect relevant requirements of the CCC EMEP monitoring strategy. The station of Bratislava-Koliba introduced measurements of the same of portfolio of heavy metals as at other regional stations in the Slovak Republic; however, this station serves only for comparison purposes and is not assessed as a regional station.

Annual averages of heavy metals in monthly precipitation - 2012

	Precip. mm	Pb µg/l	Cd µg/l	Ni µg/l	As µg/l	Zn µg/l	Cr µg/l	Cu µg/l
Chopok	776	2.13	0.08	0.55	0.29	33.82	0.27	1.18
Topoľníky	429	1.10	0.04	0.30	0.12	8.18	0.23	1.18
Starina	616	1.40	0.07	1.26	0.17	9.70	0.27	1.56
Stará Lesná	633	1.08	0.06	0.57	0.13	7.50	0.08	0.84
Bratislava, Jeséniova	734	1.49	0.06	0.44	0.20	16.41	0.18	3.28

Source: SHMI

Tropospheric ozone

Average annual concentrations of ground ozone in Slovakia in contaminated urban and industrial locations in 2012 were within the interval of 49-93 $\mu g.m^{-3}$. Greatest average annual ground ozone concentrations in 2012 were recorded at the Chopok station (93 $\mu g.m^{-3}$).

The reason for this is a high ozone concentration within the tropospheric ozone accumulation zone above the territory of Europe located 800 to 1500 metres above the earth's surface.

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 $\mu g.m^{-3}$ (max. daily 8-hour value). This value must not be exceeded on more than 25 days in of the year, for three consecutive years. The following table shows the summary of exceeding values measured over the period of 2010-2012. Public alarm threshold (240 $\mu g.m^{-3}$) and public information threshold (180 $\mu g.m^{-3}$) were not exceeded in 2012.

Number of days with exceeded target value for protection of public health

Station	2010	2011	2012	Averaged in 2010-2012
Bratislava, Jeséniova	24	24	48	**32**
Bratislava, Mamateyova	21	27	35	**28**
Košice, Ďumbierska	14	70	25	**36**
Banská Bystrica, Zelená	17	32	53	**34**
Jelšava, Jesenského	4	13	-	-
Kojšovská hoľa	55	58	37	**50**
Nitra, Janíkovce	16	11	43	**30**
Humenné, Nám. slobody	8	10	10	9
Stará Lesná, AÚ SAV, EMEP	15	17	14	15
Gánovce, Meteo. st.	7	25	12	15
Starina, Vodná nádrž, EMEP	2	7	7	5
Prievidza, Malonecpalská	9	14	12	12
Topoľníky, Aszód, EMEP	23	-	31	**27**
Chopok, EMEP	36	68	74	**59**
Žilina, Obežná	20	34	34	**29**

*Values that are **exceeding** the **limiting values** are printed in **bold** letters*

Source: SHMI

Target value for the **AOT 40 vegetation protection exposition index** is 18 000 $\mu g.m^{-3}.h$ (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 2008-2012 were exceeded at all reference urban and rural stations, with the exception of Bratislava, Jelšava, Humenné, Stará Lesná, Gánovce, Starina, Prievidza, Topoľníky, Chopok, Žilina.

Values for the AOT 40 for vegetation protection - the year 2008 and for the averaged period of 2008-2012

Station	2012	Averaged in 2008-2012
Bratislava, Jeséniova	24 255	**20 300**
Bratislava, Mamateyova	19 200	16 764
Košice, Ďumbierska	18 487	**22 399**
Banská Bystrica, Zelená	27 387	**20 748**

Jelšava, Jesenského	–	13 896
Kojšovská hoľa	20 181	**22 788**
Nitra, Janíkovce	25 206	**23 436**
Humenné, Nám. slobody	13 214	15 866
Stará Lesná, AÚ SAV, EMEP	12 607	14 439
Gánovce, Meteo. st.	11 819	15 438
Starina, Vodná nádrž, EMEP	9 320	10 289
Prievidza. Malonecpalská	16 014	14 289
Topoľníky, Aszód, EMEP	14 871	**19 390**
Chopok, EMEP	30 666	**28 169**
Žilina, Obežná	20 120	17 922

** the station did not measure data for enough years*
*Values that are **exceeding** the **limiting values** are printed in **bold** letters*
Source: SHMI

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 2037/2000 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. In 2012, in relation to the implementation of the European Parliament and of the Council 1005/2009/EC on ozone layer depleting substances, new act no 321/2012 Coll. on the Earth's ozone layer protection was adopted.

- **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.

Group of substances	1986/ 1989#	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
A I - freons	1 710.5	0.996	0.81	0.533	0.758	0.29	0.43	0.46	0.34	0.49	0.19	0.067
A II - halons	8.1	-	-	-	-	-	-	-	-	-	-	-
B I* - freons	0.1	-	-	-	-	-	-	-	-	-	-	-
B II* - CCl_4	91	0.01	0.009	0.047	0.258	0.045	0	0.016	0.099	0.119	0.039	0.072
B III* - 1,1,1 trichloroethane	200.1	-	-	-	-	-	-	-	-	-	-	-
C I*	49.7	71.5	52.91	38.64	48.76	43.94	41.32	34.35	31.12	0.578	-	0.496
C II - HBFC22B1	-	-	-	-	-	-	-	-	-	-	-	-
E -** CH_3Br	10.0	0.48	0.48	0.48	-	-	-	-	-	-	-	-
Total	2 019.5	72.986	54.21	39.7	49.78	44.28	41.75	34.83	31.56	1.187	1.229	0.635

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 and 2012 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 2012 (t)

Usage	Group of substances							
	A I	A II	BI	B II	B III	C I	C II	E
Coolant						0.496		
Detection gases, diluents, detergents	0.67			0.072				

Source: MoE SR

- **Total atmospheric ozone and ultraviolet radiation**

SHMU Aerological and Radiation centre in Gánovce pri Poprade has measured atmospheric ozone above the territory of Slovakia through the ozone spectro-photometer since 1993. Besides total ozone, this instrument regularly measures also the intensity of solar ultraviolet radiation within the spectre of 290 to 325 nm by individual time steps of 0.5 nm.

The average annual value of total atmospheric ozone in 2012 was 320.0 Dobson units (D.U.), which is 5.4% under 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 2012

Month	1	2	3	4	5	6	7	8	9	10	11	12	Year
Average (DU)	324	362	347	356	343	325	314	301	288	278	293	311	**320.0**
Deviation (%)	-5	-2	-9	-8	-8	-9	-8	-7	-4	-3	2	0	**-5.4**

Source: SHMI

Total sum of daily doses of ultraviolet erythema radiation

Total sum of daily doses of ultraviolet erythema radiation over the period of April 1 to September 30 measured at Gánovce was 450 644 J/m^2, which is by 4% less than the sum over the same period in 2011. Total sum of 479 411 J/m^2 detected at the station Bratislava-Koliba was 3% lower than in 2011.

• WATER

Key questions and key findings

What is the situation and trend in the use of water in terms of preserving the water sources?

- **Volumes of water usable per capita fluctuate due to climate conditions. Percentage of usable water abstraction after 2000 does not even reach 10%, the only exception being the year 2003 that was characterised as exceptionally dry and showing significant abstractions for irrigation purposes.**
- **Surface water abstraction after 1995 showed a significant decline despite minimal year-to-year increments and reductions. In 2012, volumes of abstracted surface water was 59.7% of abstracted volumes in 1995, and 55.8% of abstracted volumes in 2000. Between the years 2011 and 2012 abstracted volumes grew by 38.2%.**
- **Groundwater abstraction also declined after 1995; however, since 2000 its trend has been balanced, with very few increments and reductions. In 2012, volumes of abstracted groundwater were 41.6% of the abstracted volumes in 1995, and 24.6% of the abstracted volumes in 2000. Compared 2011, abstraction grew by 1.1%.**

Has there been a reduction to the pressure on the surface water quality expressed by the volume of pollution discharged into surface water?

- **Since 1994, volumes of discharged wastewater into surface water have been declining, despite year-to-year increments and reductions. In 2012, wastewater production declined by 47.2% compared to 1994, and by 38.3% compared to 2000. In 2012, volumes of organic pollution characterised by parameters of COD_{Cr}, BOD, and IS.**

What is the quality of water in Slovakia?

- **Surface water quality in 2012 at all monitored 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. Until 2007, surface water quality was assessed under the norm STN 75 221 in 5 quality categories and 8 indicator groups. In the years 1995-2007, 40-60% of abstraction sites showed the IV. and V. quality categories for the groups of F - micropollutants, and E - biological and microbiological indicators.**
- **In line with the requirements of Directive 2000/60/EC (Water Framework Directive - WFD) water quality is expressed by the ecological and chemical balance of surface water bodies. Adverse and critically adverse ecological situation was recorded in 4.13% of water bodies, reaching the length of 1 485.18 km. 176 water bodies (10%) did not reach good chemical balance.**
- **Monitoring for groundwater chemical balance in 2012 was carried out within the framework of basic monitoring (171 objects) and operational monitoring (295 objects). Both types of monitoring showed exceeded values for set contamination limits. In 1995-2006, groundwater quality was assessed under norm STN 75 7111 in 26 water management significant areas.**
- **Drinking water quality in the SR has long been of the high level. In 2012, share of drinking water analyses that complied with the limits reached the value of 99.67%, while in 2000 it was 98.64%.**
- **In 2012, classification of water suitable for bathing under Directive 2006/7/EC was carried out at 32 natural sites. 23 sites (72%) showed excellent water quality, while 8 sites (25%) were classified as having good water quality for bathing. 1 natural bathing water pool (3%) was classified as a site with sufficient quality of bathing water. The natural water bathing body of Ružín has not been classified due to the unavailability of data for the last 4 years. Over the years 2000 to 2004, water quality in water bodies was monitored for eutrophication processes expressed by the indicator of chlorophyll-a. In 2000, the concentration of chlorophyll-a was exceeded at 18 monitored water bodies.**

What is the trend in connectedness of the public to public water supplies and sewerage systems?

- **Number of inhabitants connected to drinking water from public water supplies reached 87.0% in 2012. This value does not reach the values shown by the neighbouring countries. In 1993, 4 138 thousand of inhabitants (77.8%) were connected to water supplies, while in 2000 it grew to 4 479 thousand (82.9%).**
- **Connectedness of the public to public sewerage systems is significantly less than connectedness to water supplies. 51.5% of inhabitants were connected to public sewerage systems in 1993, while in 2000 this number grew to 54.7%, and in 2012 it reached 62.4%. 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 2012 was 68 645 mil.m^3, which, compared to 2010, growth by 13 002 mil.m^3. **Runoff** from the territory has declined by 1 765 mil.m^3, compared to the previous year.

Total water volume as of 1.1.2012, in water reservoirs was 635.7 mil.m^3, which represented 55% of total usable water volume in water reservoirs. As of 1.1.2013, total available volume of the assessed accumulation tanks compared to the previous year 2012 incerased to 722.3 mil.m^3, which represents 62% of total exploitable water.

Total hydrological balance of water resources in the SR in years 1995, 2000 and 2012

	Volume (mil. m^3)		
	1995	**2000**	**2012**
Hydrological balance			
Rainfall	40 637	37 500	34 853
Annual inflow to the SR	74 717	77 999	68 645
Annual runoff	87 113	90 629	76 678
Annual runoff from the territory of the SR	12 793	12 842	7 597
Water management balance			
Total abstraction of the surface and ground water in the SR	1 386	1 172	675,39
Evaporation from water reservoirs and dams	52.20	60.00	57.25
Discharge into surface waters	1 120.30	989.80	646.60
Impact of water reservoirs (WR)	137.70	32.98	47.50
	improving	**improving**	**accumulation**
Total volume in WR as of 1st January of the following year	732.3	757.0	722.3
% of supply volume in accumulation WR in the SR	59.1	65.0	62.0
Rate of water exploitation (%)	11.0	9.1	8.89

Source: SHMI

Usable water per year per capita includes two factors: (1) increment in population, and (2) water resources provided by nature. In Central Europe, especially in Slovakia, usable water per capita and year reflects the trend in natural conditions, since the growth of population has been stagnant. Usable water fluctuates since it is has been impacted by climate conditions. For instance, in the year 2003 that was characterised as extremely dry, usable water declined by more than a half compared to the long-term mean values for the years 1931-1980 (1.29 vs. 2.84). Usable water also relates to the real water demand - water abstractions that, due to increased prices, declined significantly. Besides, the decline in abstractions below 10% points to inadequate water savings.

Usability of water per capita in the SR

	1993	2000	2003	2005	2008	2009	2010	2011	2012
Usable water ($m^3.10^3$/year/capita)	1.37	2.36	1.29	2.21	1.88	2.00	4.22	1.73	1.41
Real withdrawal (m^3/ year/capita)	297.6	220.8	196.4	170.8	122.8	115.8	111.0	109.7	125.0
% witdrawal from usable water	21.7	9.40	15.2	7.7	6.6	5.8	2.6	6.3	8.9

Source: SHMI

♦ Precipitation and runoff conditions

Total **atmospheric precipitations** in the Slovak territory in 2012 reached the value of 711 mm, which represents 93% of the normal level. In terms of precipitations, this year had been considered normal. Total excess of precipitations reached the value of 49 mm.

Based on the characteristics of the precipitation period, the year 2012 showed normal values in the watersheds of Nitra, Hron, Ipeľ, Bodva, Hornád, Bodrog, and Poprad. For the watersheds of Morava, Váh, and Slaná, the year was characterised as dry. For the watershed of Danube, the year 2012 was assessed as very dry.

Average rates of precipitation and runoff in particular catchment areas in 2012

Catchment area	**Dunaj**		**Váh**		**Hron**			**Bodrog a Hornád**			
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
Average precipitation (mm)	570	490	755	640	771	630	704	697	704	727	804
% of normal	84	78	89	92	98	92	89	95	104	103	96
Character of rainfall period	S	VS	S	N	N	N	S	N	N	N	N
Annual runoff (mm)	86	13	246	85	159	36	79	50	109	148	307
% of normal	65	36	78	59	55	26	42	30	52	50	89

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

Annual runoff volumes in SR in 2012 reached 59% of the long-term average value. Runoff volumes from partial watersheds did not exceed the long-term average for any watershed, as the values oscillated within the range of 26 to 89%.

♦ Surface water abstraction

In 2012, surface water abstractions increased to 326.429 mil.m^3, which is 38.2% more than in the previous year. Abstractions for industry in 2012 were at 259.2 mil. m^3, which was a significant growth by 82.6 mil.m^3, i.e. 46.8%, compared to 2011. A slight growth was recorded also in surface water abstractions for waterlines, which, compared to the previous year, increased by 0.55 mil.m^3, that is 1.1%. Surface water abstractions for irrigation grew and reached the value of 18.138 mil.m^3.

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

Year	Public water-supplies	Industry	Irrigation	Other agriculture	Total	Discharging
1995	71.963	661.836	74.325	0.0360	808.159	1 120.29
2000	70.571	575.872	90.540	0.0440	737.027	989.825
2009*	50.433	217.009	12.319	0.0020	279.763	605.274
2010*	48.098	205.497	5.864	0.0010	259.460	742.818
2011*	48.545	176.610	10.125	0.9210	236.201	610.093
2012*	49.090	259.200	18.138	0.0013	326.429	646.600

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

♦ Evaluation of surface water quality by the SR government Regulation 269/2010 Coll.

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 2012 were monitored in compliance with the approved Programme of Water Balance Monitoring for 2012. 314 sites were monitored under the basic and operational monitoring schemes.

Quality indicators monitored at all monitoring sites (basic and operational) in 2012 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) - magnesium, sodium, disulphate, free ammonia, fluoride, surface active substances, phenolic index, chrome (VI), vanadium, 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: alachlor, hexachlorobenzene, di-(2-ethyl hexyl) phtalate (DEHP), 4-methyl-2 6-di-tert-butylphenol, benzo(g,h,i)perylen+indeno(1,2,3-cd)pyren and cyanides. The highest permissible concentration has been exceeded in the indicators of mercury 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 and culturable microorganisms at 22 ^{o}C. 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 6 partial watersheds), thermotolerant coliform bacteria (in 6 partial watersheds), and coliform bacteria (in 7 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.

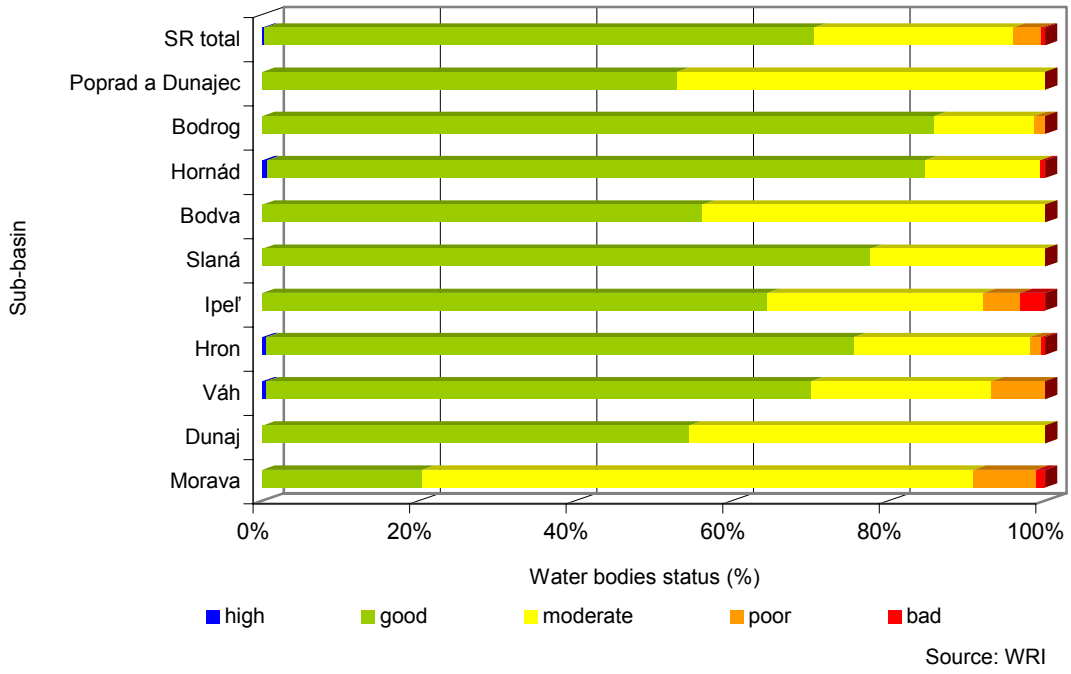
Resulting water balance is determined by the worse of the pair of chemical or ecological balance that forms the basis for the subsequent activities relating to the compliance with one of the environmental quality goals under Framework Water Directive (FWD) - to reach a favourable water balance for all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

♦ Assessment of the ecological balance of surface water bodies

Assessment of the ecological balance of surface water bodies for the year 2010 was carried out at 1 648 natural surface water bodies. Best situation in terms of the ecological balance was recorded in partial watersheds of Bodrog, Hornád, Slaná, Hron, and Váh.

Very good and good ecological balance was recorded in 70.51% of water bodies in Slovakia. In terms of water bodies' length, the number represents 55.55% (10 524.11 km). A relatively high number of water bodies showed average balance, specifically 25.36% of them, which represents the length of 5 331.95 km. Condition of surface water bodies was classified as adverse and critically adverse in 4.13% of water bodies, reaching the length of 1 485.18 km.

Share of the total number of water bodies classified into the individual ecological status/potential in the river basin of SR (2010)



Source: WRI

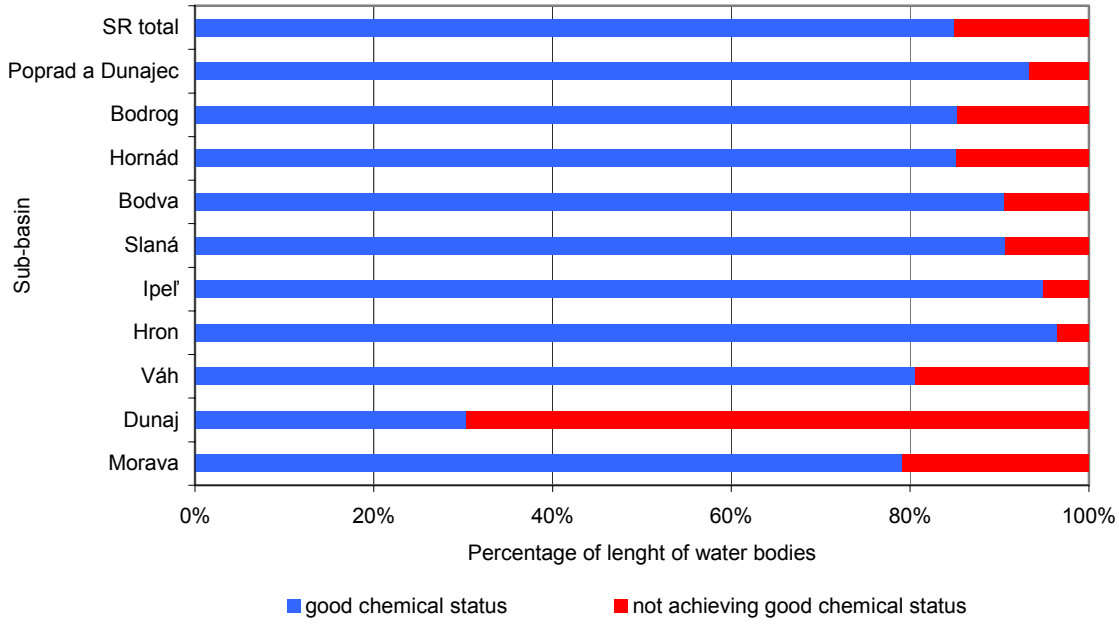
♦ Assessment of chemical balance of surface water bodies

Assessment of chemical balance of surface water bodies in 2010 was performed at 1 760 water bodies (these include 1 737 surface water bodies at rivers (flowing waters) and 23 surface water bodies at rivers with a changed category (standing waters). 1 584 (90%) water bodies in Slovakia showed good chemical balance, while 176 (10%) water bodies did not.

122 water bodies showed deficient chemical balance caused by specific synthetic pollutants, while 44 water bodies were in this condition due to specific non-synthetic priority pollutants. Seven water bodies showed exceeded environmental quality norms for both groups and no pollutants were identified in 13 water bodies since deficient chemical balance is determined on the basis of outcomes of risk analysis.

In total, 15.07% of the length of water bodies in Slovakia do not show good chemical balance. Most adverse situation exists in the partial watershed of the Danube River with almost 70% of its length not reaching good chemical balance. Watersheds of the Váh and Morava rivers follow with almost 20%.

Assessment of chemical balance of surface water bodies' lengths in 2010



Source: WRI

Groundwater

♦ Water resources

In 2012, based on the hydro-geological assessment and surveys in Slovakia, there were **78 939 l.s^{-1} available groundwater resources**. In comparison with the previous year 2011, there was observed a slight increase of the efficient groundwater volume by 138 l.s^{-1}, i.e. by 0.17%. In the long-term evaluation, the increase of the efficient volume in comparison with 1990 makes 4 164 l.s^{-1}, i.e. 5.6%.

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 **2012, out of total number of 141 hydro-geological regions in SR, 130 regions show good balance status, 10 regions show acceptable status and one region show critical status.** Emergency balancing state did not occur in any region.

♦ Groudwater levels

Average annual levels in 2012 in Slovakia showed decline, compared to 2011. Average annual values of groundwater levels declined within the interval of -20 to -100 cm. A single and non-typical increase has been recorded in the watershed of the middle and upper Váh River.

Average annual levels in 2012, compared to long-term average annual levels declined for most parts from -10 cm to -30 cm, occasionally by -80 cm in the whole territory. Occasional increases have been recorded in all watersheds, especially Danube (mostly up to +70 cm).

♦ Well capacities

Given the **average spring yields** and comparing them with the previous year, almost unified decline in yields has been observed, down to the level of -40% to -90% of last year's figures. The figures for Slaná and Bodva watersheds show only 3% - 40%. Occasional increments (mainly in the watersheds of Morava and Hornád) reached up to 125% of last year's average yields.

Average annual yields compared to long-term average yields declined in most part by 50% - 90% or less in few sites. Increments are prevalent in the watershed of the Poprad River (up to 190%), their occurrence has been recorded in the watersheds of these rivers: Morava, Nitra, Hron, Bodva, and Hornád (in most parts up to 140%).

♦ Groundwater abstraction

In 2012 there was being **extracted 10 719 l.s^{-1} of ground water in average** by the users (which are subjects to reporting obligation) in Slovakia that was 13.58% of the documented efficient volume. During the year 2012 the groundwater extractions slightly increase by 117.6 l.s^{-1} which means 1.11% in comparison with year 2011.

Groundwater extraction according to the purpose of use in years 1995, 2000- 2012 (l.s^{-1})

Year	Public water supplies	Food-processing industry	Other industr.	Agricult. and Livestock	Vegetable prod. Irrigation	Social purposes	Others	Total
1995	14 373.10	390.60	2 327.20	727.10	25.00	286.50	202.70	18 332.20
2000	11 188.38	321.23	1 177.18	446.78	18.20	432.99	632.66	14 217.42
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
2011	8 071.10	206.20	802.20	210.20	81.10	237.80	993.20	10 601.80
2012	8 149.70	256.60	797.80	221.20	108.40	218.40	967.25	10 719.35

Source: SHMI

♦ Monitoring of groundwater quality

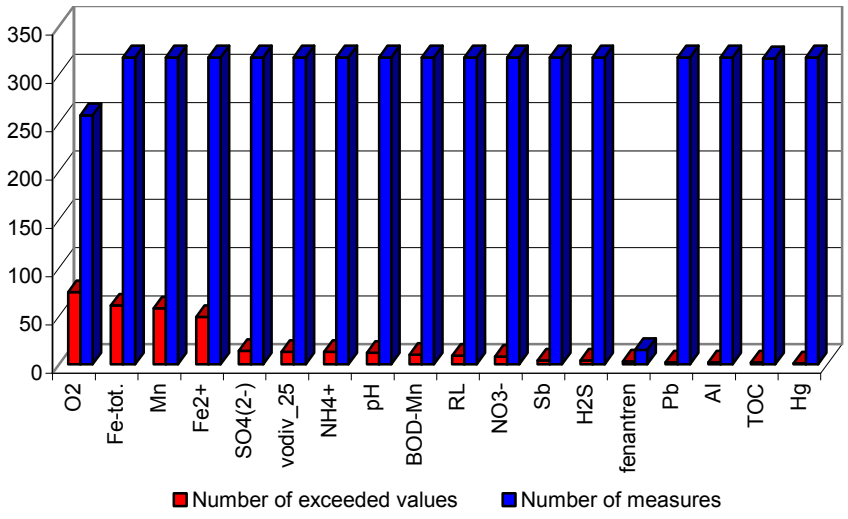
Pursuant to the WFD requirements, the older system of dividing Slovakia into significant water management areas was abandoned. Since 2007, classification has been based on delineation of groundwater formations. Monitoring of ground water chemical situation has been divided into:

- basic monitoring,
- operation monitoring.

In 2012, ground water quality was monitored at 171 **basic monitoring facilities**. Ground water samples were extracted 2 times from 39 quaternary objects, 1 times in 67 pre-quaternary objects and 11 quarternary objects, and 3 times in 54 pre-quaternary karst objects.

Recommended value for oxygen saturation percentage determined in situ was achieved in 72.09% of samples. pH values fluctuated within the limit values, with the exception of 12 samples. Of the total number of 318 measurements, conductivity exceeded the indicative value set by the government regulation in 13 cases. The issue of adverse **oxidation-reduction** conditions becomes predominant within the groundwater object basic monitoring as witnessed most frequently by exceeded admissible concentrations of total Fe (61 times), Mn (58 times), and NH_4^+ (13 times). Besides these indicators, there has been a single case of exceeded values for NO_3^- (8 times), SO_4^{2-} (14 times), and soluble substances at 105°C, COD_{Mn}, TOC and H_2S. In **trace elements**, increased concentrations were recorded for Al (2 times), Pd (2 times), Sb (4 times), and Hg (1 time). Pollution by specific organic pollutants within the basic monitoring objects shows only local character. In 2012, there was recorded a single case of increased concentration exceeding the set limit, specifically within the group of polyaromatic hydrocarbons. (phenanthrene) Majority of **specific organic substances** was below the detection limit. In the group of general organic compounds indicators, all the analyses complied with the set limit.

Occurrence of exceeded indicators at basic monitoring facilities pursuant to the SR Government Directive 496/2010 Coll. in 2012



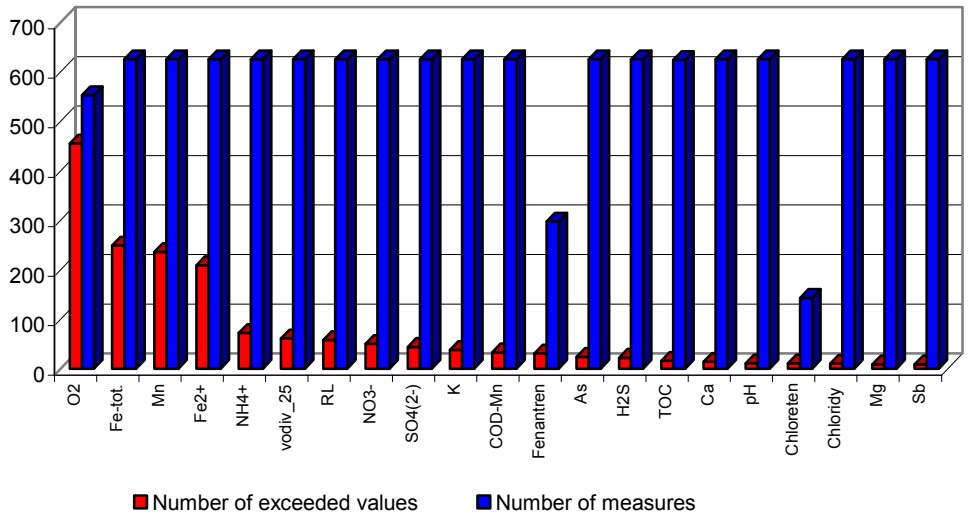
Source: SHMI

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 2012, within the operational monitoring 295 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 17.72% 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 (22 times), Mg (9 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^+ (72 times), NO_3^- (50 times) and NO_2^- (1time) being the most prevalent. In 2012, the acceptable value set by legislation was exceeded in **5 trace elements** (Al, As, Sb, Ni, and Zn) at operation monitoring facilities. Most frequently recorded increased contents include As (24 times) and Sb (9 times). The impact of anthropogenic activity on groundwater quality is indicated by the increased concentration of COD_{Mn} (33 times).

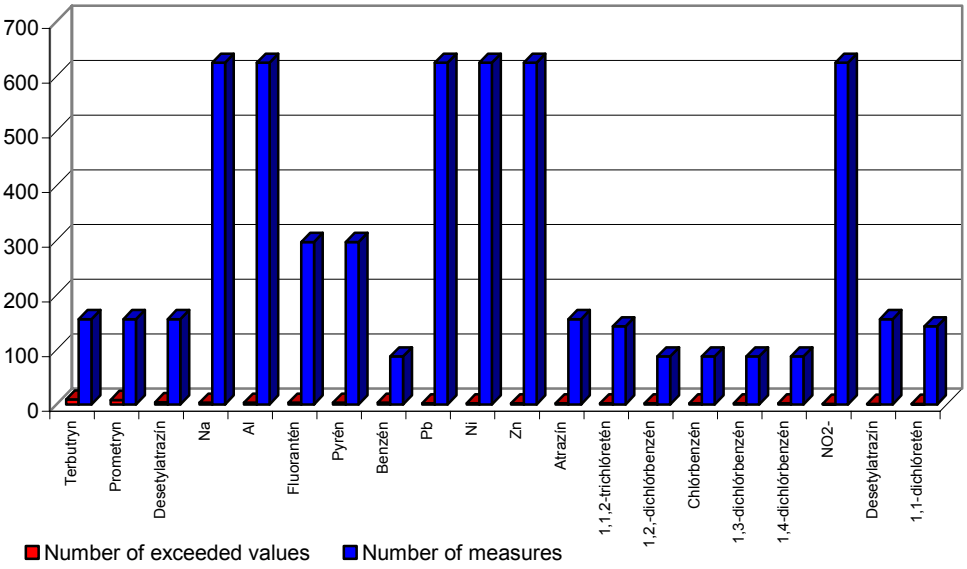
In the group of general organic compounds, values for total organic carbon exceeded the limit value as many as 16 times, while the limit values for hydrocarbon index for non-polar extractable substances (NPE-UV) in 2012 were not exceeded. Presence of **specific organic compounds** in groundwater indicates impacts by human activities. Objects of operational monitoring recorded a wider range of specific organic compounds. Most frequently exceeded values were recorded for indicators pertaining to the category of polyaromatic hydrocarbons (phenanthrene, fluoranthene, pyrene, chloroethylene, dichlorobenzene, and trichlorethylene) and pesticides (desethylatrazine, atrazine, deethylatrazine).Exceeded were also the limit values for the category of volatile aliphatic hydrocarbons and volatile aromatic hydrocarbons.

Occurrence of exceeded indicators at operation monitoring facilities pursuant to the SR Government Directive 496/2010 Coll. in 2012



Source: SHMI

Occurrence of exceeded indicators at operation monitoring facilities pursuant to the SR Government Directive 496/2010 Coll. in 2012



Source: SHMI

♦ Assessment of the condition of groundwater bodies

Assessment of the condition of groundwater bodies has been carried out by assessing their chemical balance and the quantitative balance.

In Slovakia, 101 groundwater bodies have been designated, including 16 quaternary, 59 pre-quaternary, and 26 geothermal groundwater bodies. For the purposes of groundwater chemical balance assessment in 2012, all quaternary and pre-quaternary groundwater bodies were covered with monitoring objects, with the exception of 2 pre-quaternary bodies. Groundwater quality was monitored at 466 objects including 164 within pre-quaternary and 302 within quaternary bodies. Geo-

thermal groundwater formations have not been assessed due to the absence of data on their usable potential and on their monitoring and use.

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.

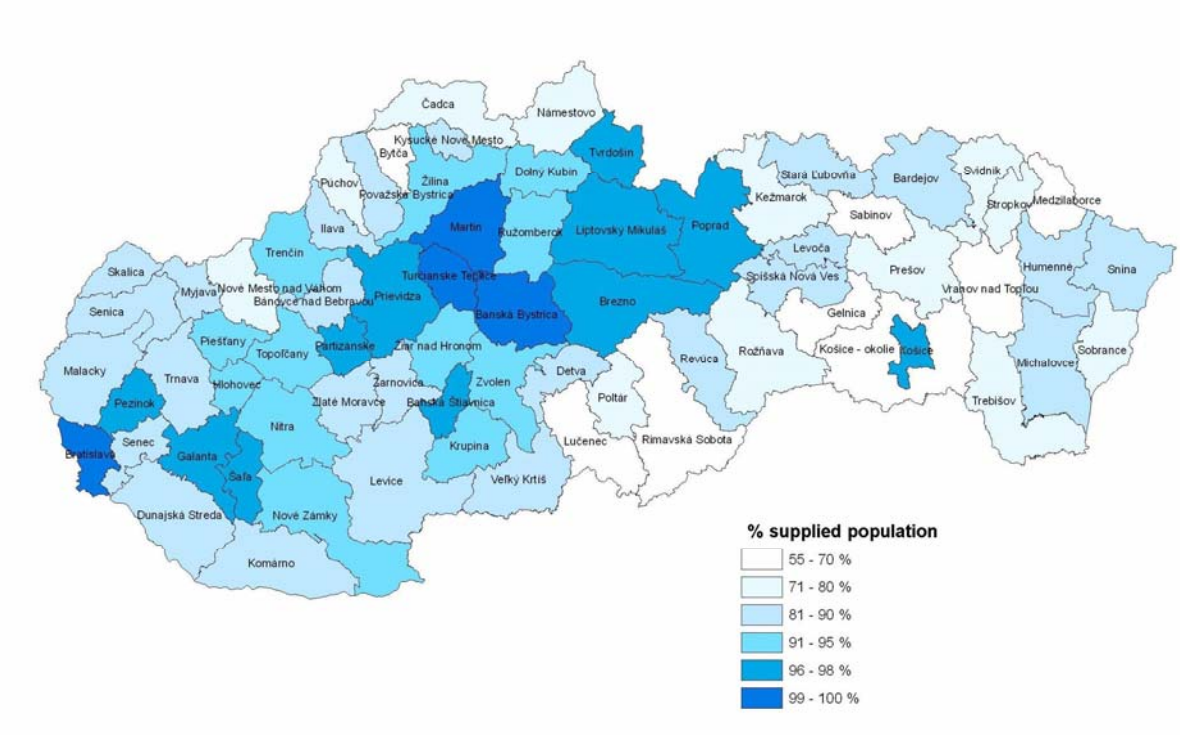
Public water supplies

♦ Infrastructure in supplying the public with drinking water

Number of inhabitants supplied with water from public water supplies in 2012 declined compared to the previous year by 15.8 thous. inhabitants down to 4 707.0 thous., however, the percentage of supplied inhabitants grew to 87.0% of total Slovak population. Decline in the number of supplied inhabitants was due to decreased figures in the Slovak population as shown by the census of 2011. In 2012, there were in the SR 2 349 individual municipalities that were supplied with public supply water, and their share in total SR municipalities was 81.3%.

In 2012, major changes were registered in drinking water abstraction. **Volume of produced drinking water** reached the value of 302 mil.m^3 of drinking water, which, compared to 2011, represents an increase by 3 mil.m^3. Of all groundwater sources, 256 mil.m^3 was produced (increased by 2 mil.m^3), while 46 mil.m^3 of drinking water was produced of all surface water sources (increased by 1 mil.m^3) Of total water produced at water management facilities, **water losses** by pipe network were 27.6% in 2012. **Specific water consumption by households** decreased to 80.8 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 supplies in 2012 (%)



Source: WRI

♦ 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 2012, were analysed at operation laboratories of water management companies 9 274 samples. The samples were abstracted at sites located within distribution networks and 251 195 analyses were

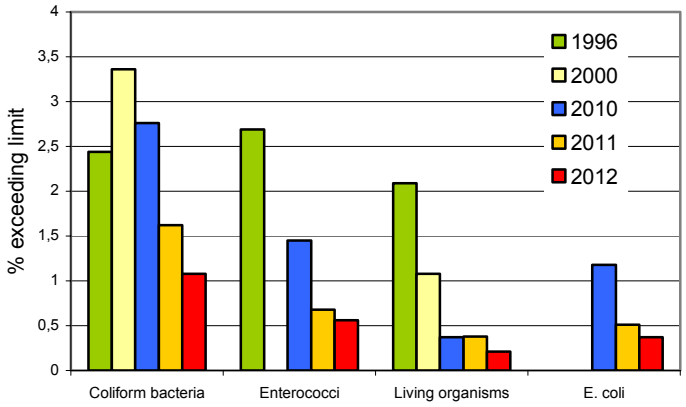
carried out to monitor individual drinking water quality indicators. Share of drinking water analyses that complied with the sanitary limits in 2012 reached 99.67% (in 2011 it was 99.60%). Percentage of samples that meet drinking water quality demands for all indicators reached 94.27% (in 2011 it was 92.05%). 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

Year	2000	2005	2012
Share of drinking water samples that do not meet the NMH and MHRR limit.	4.54 %	2.10 %	0.65 %
Share of drinking water quality indicators analyses that do not meet NMH and MHRR	1.36 %	1.15 %	0.73 %
NMH - maximum threshold values, MHRR – threshold values of the reference risk			

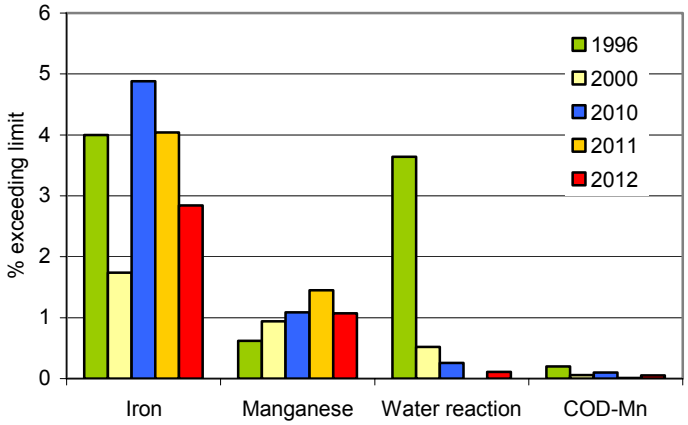
Source: WRI

Results of monitoring the microbiological and biological indicators of drinking water within Slovakia's distribution networks (1996-2012)



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 (1996 – 2012)



Source: WRI

Waste water discharge and treatment

♦ Waste water production

In 2012, 647 159 thous.m^3 of **waste water** were discharged into the surface water, which represents a growth by 34 784 thous.m^3 (5.7%) compared to the previous year. When compared with 2000, it is less by 400 522 thous.m^3 (38.3%).

Compared to the previous year, volumes of organic contamination of surface water continued to decline. The contamination was characterised by the following oxygen regime parameters: chemical oxygen demand by dichromate (COD_{Cr}) by 1 500 tonnes per year, biochemical oxygen demand (BOD) by 263 tonnes per year, and for the parameter of insoluble substances (IS) by 1 037 tonnes per year.

Major sources of organic contamination of water bodies include residential agglomerations, industry, and agriculture.

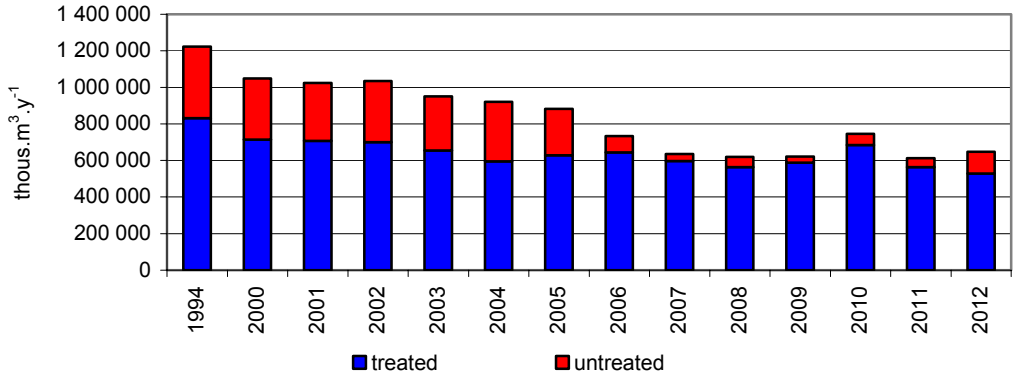
Percentage of discharged treated waste water to **total volumes of waste water** discharged into watercourses in 2012 was 81.62 %.

Load of the balanced contamination sources discharged into surface watercourses in the period of years 1994, 2000-2012

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} ($t.y^{-1}$)
1994	1 223 549	41 446	34 275	106 960	772
2000	1 047 681	23 825	20 205	61 590	298
2001	1 024 320	22 998	19 707	61 599	270
2002	1 035 068	22 790	18 803	59 204	252
2003	950 686	21 193	17 372	56 829	232
2004	919 869	21 389	13 702	45 162	57
2005	881 946	12 670	10 661	37 312	55
2006	773 594	11 200	9 026	31 563	44
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
2011*	612 375	7 258	4 825	21 358	28
2012*	647 159	6 221	4 562	19 858	25

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

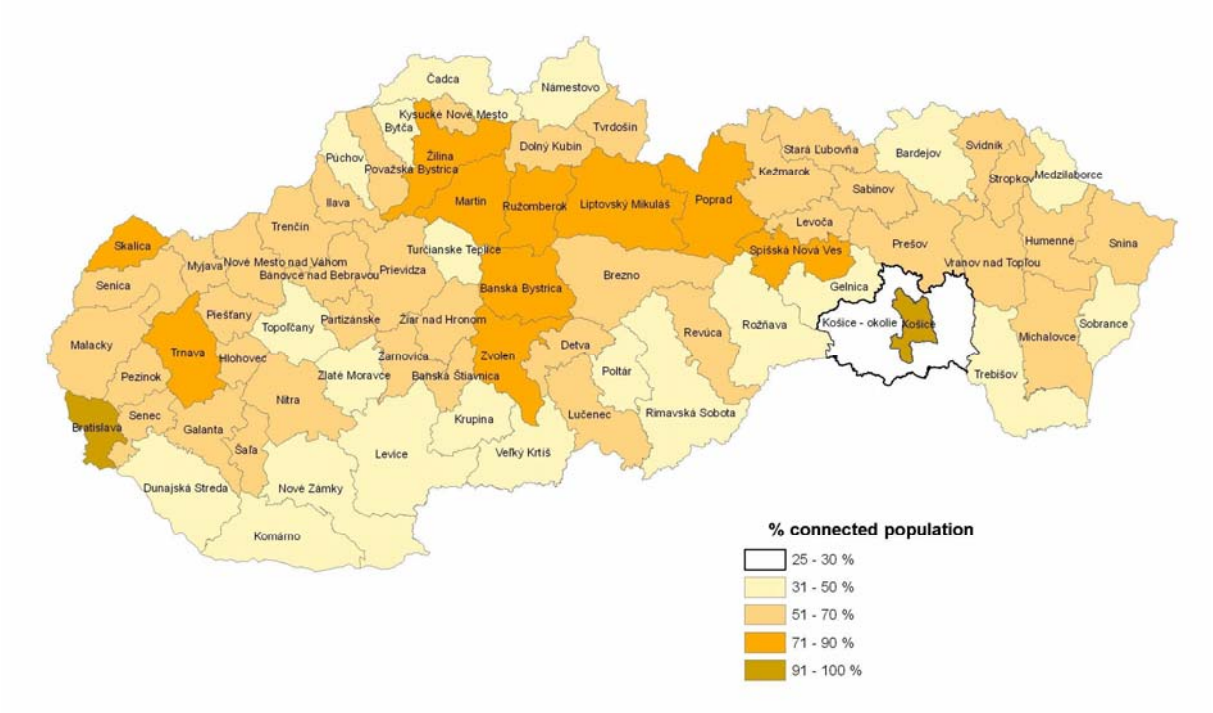
Trend in discharging of the treated and untreated waste waters into watercourses in the period of 1994, 2000-2012 Source: SHMI



♦ Waste water discharge

Development of public sewerage systems lags behind that of public water supplies. **Number of inhabitants** living in households **connected to public sewerage systems** in 2012 reached the number of 3 376 thous. inhabitants, which is 62.4% of all inhabitants. Of the number of 2 891 of stand-alone municipalities in 2012, 953 of them had public sewerage systems in place (i.e. 33.0% of all Slovak municipalities).

Connecting of the inhabitants to the public sewerage network in 2012 (%)



Source: WRI

♦ Waste water treatment plants

In 2012, 631 waste water treatment plants were administered by water management companies, municipal governments, and other subjects, most of these plants have been mechanical-biological WWTPs. Total capacity of WWTPs in 2012 was 2 010.3 thous.m^3 per day.

In 2012, watercourses with public sewerage system (administered by municipalities and water management companies) received 389 mil.m^3 of discharged waste water, which was by 25 mil.m^3 less than in the previous year, and the volume of treated waste water discharged into the public sewerage system reached 380 mil.m^3.

Volume of the discharged wastewater by the public sewerage system (in administration of VaK and in administration of the municipalities) in 2012

Water discharged by the public sewerage and WWTP	Sewage	Industrial and other	Precipitation	Separate	Total
	(thous.m^3.$year^{-1}$)				
Treated	111 921	86 263	44 895	137 898	380 977
Untreated	3 215	615	1 047	3 066	7 943
Total	**115 136**	**86 878**	**45 942**	**140 964**	**388 920**

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	Applied into the agricultural soil	Applied into the forest soil	Composted and used in other way	Incinerated	Land filled	In other way
2007	55 305	0	0	42 315	0	3 590	9 400
2008	57 810	0	0	38 368	0	8 676	10 766
2009	58 582	0	0	47 056	0	2 696	8 830
2010	54 760	923	0	35 289	0	16	6 681
2011	58 718	358	0	50 111	0	2 306	5 943
2012	58 706	1 140	0	49 642	0	7 924	0

Source: WRI

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.

Assessment of natural bathing waters in 2012 included 84 sites that are used also for recreational purposes. Of this, recreational activities are organised at 23 sites and their operation was licensed by the Regional Public Health Authority (RPHA). In cases of non-organized recreational activities, monitoring of sites was carried out by the RPHA depending on the number of visitors and the existing situation. Frequency in water quality monitoring was roughly every other week and depended on the site's significance.

Over the season, 506 water samples were extracted and 7 245 tests were done on chemical, physical, microbiological, and biological water quality indicators. Limit value (LV) for set indicators was exceeded for 195 samples and in 352 indicators, which is 38.3% of total number of samples. (increased by app. 4 %, compared to the previous year). When assessed by indicators, proportion of non-compliant indicators is only 4.86%, 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 68.45% of total number of non-compliant indicators. Most frequently occurring physical and chemical indicators included: transparency, colour, water oxygen saturation, water reaction and less frequently total phosphorus and phenols. The greatest number of non-compliant microbiological indicators included intestinal enterococci, less E. coli, and occasional coliform bacteria.

In 2012, Slovakia carried out the second assessment and qualification of bathing waters, also in

line with the Directive 2006/7/EC. This assessment has been applied to 32 sites that have been declared so-called bathing waters by the general binding decrees of regional environmental offices. 23 sites of bathing waters have been classified as sites with excellent bathing water quality, 8 sites showed good bathing water quality, and one site had sufficient bathing water quality. The natural bathing site of Ružín has not been assessed since it did not have available data for 4 years that is needed to assess water for bathing purposes under the methodology published in Directive 2006/7/EC.

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.

Eutrophication

Eutrophication under article 2 of Council Directive 91/27/EEC on treatment of municipal wastewater means enriching the water with nutrients, mainly nitrogen and phosphorus compounds, which causes an increased growth of algae and higher plant forms. This may bring about an undesirable deterioration in the biological equilibrium and quality of such water. The indicators that characterise eutrophication of surface water include $N\text{-}NH_4$, $N\text{-}NO_3$, $N\text{-}NO_2$, N_{total}, and $P_{total.}$and biomass of phytoplankton (chlorophyll-a (CHLa) and the abundance of phytoplankton (ABUfy)).

356 abstraction sites were assessed in the period of 2008-2011 in order to evaluate eutrophication of watercourses in Slovakia. Oligotrophic state was recorded in 30.89% of abstraction sites, while the mesotrophic state in 37.92% of abstraction sites. About one fifth of sites was in the eutrophic state (31.34%) while 9.83% of sites were in the hyper-eutrophic state. These included mainly monitoring stations at streams that have been impacted, besides agriculture, also by point pollution sources. Of the towns assessed under the French methodology, those sites that show trophic conditions as eutrophic or hyper-eutrophic may be considered threatened by eutrophication or with existing eutrophication. These sites call for close attention and in cases of continuing stagnation or deterioration, adequate measures for water quality improvement should be proposed.

• ROCKS

Key questions and key findings

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

- **Activity of slope deformations is closely related to climatic conditions, especially to long-term intensive precipitations. The years 2011 and 2012 were poor in long-term intensive precipitations (unlike the year 2010 that was characteristic for extreme precipitations during the spring and summer months) which resulted in reduced groundwater levels within the landslide body. Reduction in the levels has been closely connected to reduced yield of draining wells and decreased movement dynamics of slope deformations, which was a positive trend that dominated at almost all monitored slope deformations.**
- **While two earthquakes were recorded as macro-seismic in Slovakia in 2011, in 2012 there were six earthquakes recorded - the earthquake of 05.03.2012 in the region of Záhorie, earthquakes on 02.05.2012 and 22. 06. 2012 in eastern Slovakia in the region of Vihorlatské hills, earthquakes on 31. 05. 2012 and 01.06.2012 in the region of High Tatras, and an earthquake on 18.11.2012 in the region of Dobrá Voda.**
- **Contamination of the environment by anthropogenic sediments of the character of environmental loads in monitored landfills and sludge beds has remained at approximately the same level as in 2011. Anticipated negative safety condition existing at the sludge beds of Slovinky and Nižná Slaná was confirmed by the report on technological and safety supervision of sludge beds elaborated by the state-owned company of Vodohospodárska výstavba š.p. in Bratislava.**
- **Monitoring of alluvial sediments points to a long-term contamination with fluctuating contents of pollutants in the water streams of Nitra, Štiavnica, Hornád, Hnilec, and Hron.**

In what condition has been the use of the geo-thermal energy in Slovakia?

- **Geo-thermal waters have been exploited at 36 agricultural sites, for heating purposes of buildings, and for leisure activities. In agriculture, geo-thermal water has been used for heating up greenhouses at the production of vegetable (cucumbers, tomatoes, peppers, eggplants) and flowers (Bešeňová, Podhájska, Čilližská Radvaň, Topoľníky, Tvrdošovce, Horná Potôň, Dunajská Streda, Vlčany, Veľký Meder, Topoľovec, Dunajský Klátov, Kráľová pri Senci, Nováky) and for fisheries. (Vrbov, Turčianske Teplice).**
- **Geo-thermal energy has been used to heat up office space and technological facilities in Galanta, Topoľníky, Komárno, Bešeňová, Liptovský Trnovec, and Poprad, while hotel facilities are heated in Bešeňová, Veľký Meder, Podhájska, and in Štúrovo. In Galanta, geo-thermal water is used for heating up residential apartments, hospital, and pension house. In Nováky - Koš, geo-thermal water has been used to heat up locker rooms for miners and to heat up air for air conditioning in lignite mines.**
- **At 32 sites, geo-thermal water has been used for leisure purposes, especially for filling up swimming pools. (Poprad, Vrbov, Liptovský Trnovec, Bešeňová, Oravice, Podhájska, Senec, Kráľová pri Senci, Dunajská Streda, Galanta, Veľký Meder, Lehnice, Diakovce, Topoľníky, Tvrdošovce, Nové Zámky, Šaľa, Poľný Kesov, Gabčíkovo, Štúrovo, Komárno, Patince, Bánovce nad Bebravou, Malé Bielice, Partizánske, Chalmová, Koplotovce, Kremnica, Sklené Teplice, Rajec, Dolná Strehová, Tornaľa).**

Geological environmental factors

In line with the approved **Programme of monitoring for the year 2012,** monitoring has been carried out within the subsystem for **three basic types of slope displacements** - landslide (28 monitored sites), creep (4 sites) and indications of slope displacements of the character of tumbling. (9 sites) Stabilisation water levy in Handlová forms an individual specific category within the environment stability assessment process. Compared to the previous year, monitoring has been suspended in the landslide area above the municipality of Chmiňany where it has been carried out by the National Highway Company, Inc. of Bratislava.

The monitoring process included, beyond the scope of the Monitoring Programme in 2012, the most prominent slope deformations that occurred or have been reactivated in 2010 - the sites of Kapušany, Ruská Nová Ves, Petrovany, Nižná Myšľa, and Vyšná Hutka. Geological and engineering surveys were carried out on the said landslides in the period of years 2011/2012 and they provided the background for design and implementation of geological environment sanation activities. Sanation works were carried out mainly in 2012.

In 2012, as many as 7 415 tele-seismic, regional or local seismic phenomena were interpreted. More than 32 540 seismic phases were defined in seismic records. Approximately 70-80 earthquakes were localized, with the epicentre in the Slovak Republic. Macro-seismic observations confirmed 6 detected earthquakes in Slovakia.

In 2012, **environmental loads of the character of waste landfills and sludge beds** were monitored at these 12 sites: Bojná, Dunajská Streda, Krompachy - Halňa, Modra, Myjava-Surovín, Nižná Slaná, Poša, Prakovce - I., II.,Šaľa, Slovinky, Šulekovo, and Zemianske Kostoľany.

In 2012, continuing monitoring of **ore deposit areas** included Rudňany, Slovinky, Smolník, Novoveská Huta, Rožňava, Pezinok, Kremnica, Špania Dolina, Dúbrava, Nižná Slaná, and Štiavnicko-hodrušský ore district, as well as areas of lignite mining within the Upper-Nitra mining district.

Geothermal energy

At present, there are 26 designated geothermal areas in Slovakia, taking up 27% of the state's territory. To this day, 144 geothermal wells have been made in these designated areas, analysing 2 084 $l.s^{-1}$ of water with the outflow temperature of 18 – 129°C. Geo-thermal water was detected through wells with the depth of 56 – 3 616 m. Yield at the free overflow from these wells fluctuated within the interval of 1.50 $l.s^{-1}$. to 100 $l.s^{-1}$.Dominating are water types of Na-HCO_3, Ca-Mg-HCO_3-SO_4 and Na-Cl with the mineralization of 0,4 - 90,0 $g.l^{-1}$. Thermal output of geo-thermal water of these wells used up to its reference temperature of 15°C is 347.61 MWt, which represents 5.58% of the total mentioned geo-thermal energy potential in 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 2012)

Type of abandoned mine	
Mining shaft	5 566
Pit (hole)	696
Chute	65
Cut, excavation	133
Pingo	3 988
Pingo field	107
Pingo draw	130
Dump	6 454
Old randing	204
Sink mark	281
Placer	26
Tailings dump	53
Other	149
Total	**17 852**

Source: SGI DS

Minerals deposits balance

Energy deposits (state to the date 31st December 2012)

Raw material	Number of deposits	Number of deposits for mining	Unit	Balance deposits free	Geological deposits
Anthracite	1	-	thous. t	2 008	8 006
Bitumen sediments	1	-	thous. t	9 776	10 793
Brown coal	11	4	thous. t	113 565	463 706
Flammable natural gas – gasoline gas	9	1	thous. t	199	394
Lignite	8	1	thous. t	111 211	618 331
Underground stores of natural gas	13	2	mil. m^3	807	6 510
Crude oil non-paraffinic	3	-	thous. t	1 592	3 421
Crude oil - semi-paraffinic	8	4	thous. t	126	6 341
Uranium ores	2	-	thous. t	5 427	9 303
Natural gas	36	13	mil. m^3	7 9111	24 480
Total	**91**	**24**	thous. t mil. m^3	243 904 8 718	1 120 295 30 990

Source: SGI DS

Ore deposits (state to the date 31st December 2012)

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	-	thous. t	85	3 291
Complex Fe ores	7	-	thous. t	5 751	57 762
Cu ores	10	-	thous. t	-	43 916
Hg ores	1	-	thous. t	-	2 426
Poly-metallic ores	4	-	thous. t	1 623	23 671

Wolfram ores	1	-	thous. t	-	2 846
Gold and silver ores	12	1	thous. t	58 402	172 628
Fe ores	2	-	thous. t	14 476	18 743
Total	**46**	**1**	**thous. t**	**80 337**	**325 283**

Source: SGI DS

Non-metallics deposits (state to the date 31st December 2012)

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	658 748	1 249 891
Baryte	6	1	thous. t	9 205	12 655
Bentonite	29	11	thous. t	35 758	48 906
Cast basalt	5	1	thous. t	22 373	39 548
Decorative rock	22	2	thous. m^3	11 760	26 142
Diatomite	3	-	thous. t	6 556	8 436
Dolomite	21	10	thous. t	667 969	694 436
Precious stones	1	-	ct	1 935 867	2 309 085
Graphite	1	-	thous. t	-	294
Halloysite	1	-	thous. t	-	2 249
Rock salt	4	-	thous. t	838 697	1 349 679
Kaolin	14	1	thous. t	50 884	59 771
Ceramic clays	38	4	thous. t	117 739	192 622
Quartz	7	-	thous. t	301	327
Quartzite	15	-	thous. t	17 448	26 950
Magnesite	10	3	thous. t	764 138	1 157 950
Talc	5	1	thous. t	93 699	242 162
Mineralized I - Br waters	2	-	thous. m^3	3 658	3 658
Pearl stone	5	2	thous. t	30 166	30 436
Pyrite	1	-	thous. t	-	14 839
Gypsum	6	2	thous. t	49 176	93 412
Sialitic raw material	5	2	thous. t	108 770	122 133
Glass sands	4	2	thous. t	410 354	589 080
Mica	1	-	thous. t	14 073	14 073
Building rock	131	84	thous. m^3	659 541	788 645
Gravel sands and sands	25	12	thous. m^3	139 785	158 811
Brick clay	37	7	thous. m^3	92 122	114 398
Techn. usable miner. crystals	3	-	thous. t	253	2 103
Limestone – unspecified	29	14	thous. t	1 923 921	2 160 868
High-content limestone	10	4	thous. t	3 185 405	3 349 327
Limestone-marl	8	2	thous. t	163 911	166 163
Zeolite	6	3	thous. t	113 876	119 475
Foundry sands	14	1	thous. t	306 228	543 076
Refractory clays	7	1	thous. t	3 085	5 309
Feldspars	8	-	thous. t	20 548	21 786
Total	**1** **273** **217**	**-** **66** **105**	**ct** **thous. t** **thous.m^3**	**1 935 867** **9 613 281** **906 866**	**2 309 085** **12 317 956** **1 091 654**

Source: SGI DS

Classification of mineral deposits by state of extraction (state to the date 31st December 2012)

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.	229
2	Deposits with fading extraction activity include extraction mineral deposits where extraction activity will cease in a near future (within 10 years)	31
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)	32
4	Deposits with ceased extraction include exclusive mineral deposits with definitely or temporarily stopped extraction activity.	87

5	Non-extracted deposits include documented exclusive mineral deposits soon to be constructed and extracted.	46
6	Non-extracted deposits include documented exclusive mineral deposits with no plans for their extraction.	191
7	Surveyed deposits include deposits of exclusive and non-exclusive minerals with various degree of mapping.	12
Total		**628**

Source: SGI DS

Non-reserved mineral deposits (state to the date 31st December 2012)

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	23	3
Sialitic raw material	6	-
Building stone	187	60
Gravel sand and sands	215	90
Brick clay	46	-
Tuff	2	-
Brucite	1	1
Total	**492**	**156**

Source: SGI DS

• SOIL

Key questions and key findings

What is the trend in the situation of the agricultural land types in terms of their contamination by risk elements?

- **Monitored concentrations of risk elements in agricultural soils in Slovakia have been below the limit for the most part. Records showed only increased contents of cadmium and lead in certain fluvisols, especially in lower regions of watercourses.**
- **Risk substances from the first three monitoring cycles (abstraction years of 1993, 1997, and 2002) were assessed under already invalid Decision of the Ministry of Agriculture of the Slovak Republic no. 521/1994 - 540 on highest permissible values of pollutants in the soil. Outcomes of the 3. cycle (abstraction year of 2002) showed that the contents of the majority of risk substances in selected agricultural land types in Slovakia did not exceed the set limit of that time. 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. Since between the 3. and 4. abstraction cycle (abstraction years of 2002 and 2007) there was a change in legal policies, it has not been possible to carry out comparisons in the contamination by risk substances under the currently valid legal framework.**

What is the current balance of soil organic carbon (SOC) as one of the key indicators of soil quality?

- **Currently, due to climatic changes and intensive changes in the use of land, the supplies of organic carbon in the soil has been changing quite rapidly. Based on the outcomes of the monitoring of land in Slovakia it has been shown that the average values of organic carbon within the arable land (AL) horizon of the same soil types are significantly lower that those on permanent grassland (PG), which has been the result of a long-term intensive tilling activities on AL. Mollicfluvisols show the highest SOC values, while pseudogley soils and brunisolic soils show the leat SOC values.**
- **When comparing the SOC situation for the 1. (abstraction year of 1993) and the last 4. (abstraction year of 2007) monitoring cycle, there was a growth in the contents of SOC in all major soil types, including arable land, as well as permanent grassland. The highest growth of SOC on AL has been recorded on mollicfluvisols and fluvisols.**
- **Changes to the SOC contents between the last two monitoring cycles 3 and 4 (abstraction years of 2002 and 2003) have not been so evident as when comparing cycles 1 and 4 (abstraction years of 1993 and 2007). This period clearly shows minimal increment in the soil organic carbon on monitored permanent grasslands. Arable land types in the cases of cambisols and chernozems showed stagnation in SOC and a very slight decline in the SOC contents was shown in pseudogley soils and brunisolic soils. Fluvisols and mollicfluvisols showed statistically significant growth in SOC in the period between the last two cycles.**

What is the share of the agricultural land types threatened by erosion?

- **Approximately 39% of total agricultural land size was threatened by water erosion in 2012, while 5.5% was threatened by wind erosion.**
- **Since the end of the 2. monitoring cycle (year 2001) up to the present day, potential water erosion has been on decline. Sizes of the potential wind erosion have not been high and have not significantly changed over the recent years.**
- **When comparing the size of land threatened by potential erosion expressed by erosion categories of the middle to extreme character at the end of the 1st monitoring cycle (the year 1996) compared to the year 2012 this size experienced decline by 183 677 ha for water erosion and by 20 190 ha for wind erosion.**

Land use

Total size of the Slovak Republic is 4 903 557 ha. In 2012, the share of agricultural land was 49.07% of total land size, while the share of forestland was 41.07%, and the share of non-agricultural and non-forest lands was 9.86%.

Land Use categories (state to the date 31st December 2012)

Land category	Area (ha)	% of total area
Agricultural land	2 405 971	49.07
Forest land	2 014 059	41.07
Water areas	94 764	1.93
Build-up land	232 599	4.74
Other land	156 163	3.19
Total area	**4 903 557**	**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. Development in the size of the land in Slovakia in 2012 was impacted by **a continuous decline in the size of agricultural and arable land.**

The greatest percentage growth compared to 2000 has been recorded in the category of built-up areas and courtyards by 6.05% (+13 261 ha) that grew at the expense of all other categories, with the exception of forests and water bodies.

Artificial built-up areas within the EU comprise 4.3% of total land cover. As for Slovakia, this area takes up 2.4%, which is the least area size of all the neighbouring countries.

Monitoring of soils and their quality

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.

♦ Soil contamination by hazardous substance

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,

Assessed **concentrations of the risk elements (Cd, Pb, Cr, Cu, Zn, Ni, As, Hg)** within agricultural land types of Slovakia have **mostly been under the limit.** Some fluvisols showed increased contents of Cd and Pb, especially in the lower areas of water courses, which points to their frequent transport from more remote areas. Increased contents of Cd have been recorded in some rendzinas. Accumulation of Cd has been favoured by the organic matter and the neutral soil reaction at which this element becomes less dynamic.

The sites that in the past were contaminated (close to industrial facilities and within the geo-chemical anomalies impact area) are contaminated also nowadays, which means that soils have retained this adverse condition over a long time. The example of water-soluble fluoride in the **area of Žiarska basin** points to the fact that after a significant improvement in the contents of fluoride in emissions within that given area especially after 1998 there has been only a slight improvement in the soil. In fact, even at the present time, **values of water-soluble fluoride exceed almost 5 times the valid sanitary limit** (opposite the aluminium factory on pseudogley soils). As for the future, it will be necessary to continue with monitoring of these types of soils.

♦ Acidification of soils

Acidification as a process of raising the soil's acidity, represents one of the important processes of chemical soil degradation. The optimum value of soil reaction belongs to the key aspects of soil assessment. Each owner of agricultural land is obliged to implement the appropriate agro-technical measures focused on preserving soil quality and protection against its damage. Although acidification is a reversible process, consequences of acidification within the agro-eco-system are irreversible.

Development of the soil reaction (pH/H_2O) in the soils of Slovakia on the basis of comparing the outcomes of four cycles

Major land unit	1993	1997	2002	2007
Mollicfluvisols AL	7.29	7.24	7.03	7.08
Fluvisols AL	7.13	6.95	6.84	6.75
Chernozem AL	7.28	7.31	7.22	7.14
Brunisolic soil AL	6.71	6.85	6.90	6.66
Pseudogley soil AL	6.66	6.70	6.47	6.45
Pseudogley soil PG	6.31	6.24	6.13	5.88
Rendzinas AL	7.27	7.25	7.54	7.97
Rendzinas PG	7.17	7.18	6.57	7.27
Regosols	6.68	6.54	6.95	6.90
Cambisols AL	6.56	6.42	6.18	6.24
Cambisols PG	5.61	5.56	5.29	5.48
Solonchaks and solonetz PG	8.29	7.88	8.45	8.34
Podsols, rankers, lithomorphic soils PG	4.21	3.93	3.88	3.77

AL – arable land, PG – permanent grassland Source: SSCRI

Outcomes of the partial monitoring system - P have shown **more significant acidification tendencies mainly on cambisols and pseudogley soils** where it is possible to assume, given the limitation of agro-technical measures focusing on optimisation of the soil reaction values, a slow growth of soil reaction on the substrates that are naturally acidic. Acidification trends in soils with soil reaction showing mild acidic values may in the future result in deteriorated sanitary condition of the environment witnessed by the increased penetration of diverse pollutants that include especially heavy metals and aluminium into the food chain.

Active aluminium in agricultural soils in Slovakia has been significantly **lower in arable lands as opposed to grassland,** which is the consequence of the relationship between the soil quality and its use. Despite of this, high maximum values have been recorded also on arable land and they are in direct correlation with the lower soil reaction.

♦ Salinisation and sodification

The processes of salinisation and sodification have been monitored since 2000 on the built network of 8 stationary monitoring sites of which 6 are situated in the Poddunajská plane. These include mollicfluvisols in different stages of development of salinisation and sodification, along with solonchanks. In the area of the East-Slovakian lowland the monitoring network includes the solonchak in the municipality of Malé Raškovce. Anthropogenic sodification of soil by industrial emissions from aluminium production has been monitored in the vicinity of Žiar nad Hronom.

Process of sodium salts accumulation has been indicated over the period of three monitoring cycle. First of all it addressed over-limit values of total salt contents in all monitored lands. This process has been weak in the soils of Iža and Zemné and the values of total salt contents found in the interval of 0.10 - 0.15% point to the initial stage of salinisation. The sites of Gabčíkovo and Zlatná na Ostrove within the lower horizons recorded a transition into the middle salinisation level with the salts content of 0.15 - 0.35%. Middle level of salinisation was recorded also in the overall soil profile at the site Komárno-Hadovce where however occurred a decline in the overall salts contents for the whole

monitored period. The sites of Malé Raškovce, Kamenín, and Žiar nad Hronom showed extreme contents of salts, especially within the 3 rd monitoring cycle, which may qualify them as **solonchaks.** Highest values were recorded mainly within the lower strata of arable land and substrate horizons. This proves that the process of salinisation takes place from the lower horizons up to the soil surface.

Soil sodification as a process of binding exchangeable sodium onto the sorption complex of monitored soils in 2012 is comparable to the previous years. Contents of exchangeable sodium within the sorption complex of 5 - 10% indicating a weak sodification was detected within the lower horizons of these sites: Iža, Zemné, Gabčíkovo, Komárno-Hadovce site. **High** (10 - 20%) **to very high** (above 20%) **contents of exchange sodium** have been recorded **at the sites of Zlatná, Malé Raškovce, Kamenín,** as well as within anthropogenicaly salinised soil at the site of **Žiar nad Hronom.** Soil sodification has been defined by soil reaction of pH > 7.3. The recorded values suggest that soil reaction of the majority of the monitored soils and horizons is mid – alkaline (pH 7.3 - 8.5). Only the sites of Kamenín and Žiar nad Hronom have been regularly recording strongly alkaline soil reaction values (pH above 8.5).

♦ Organic carbon in the soil

Contents and quality of the soil organic matter (SOM) is the energy basis for a number of biological processes. While it affects the productive function of soil, it also takes part in its extra-productive, mainly ecological functions.

Currently, due to climatic changes and intensive changes in the use of land, the supplies of organic carbon in the soil has been changing quite rapidly. Based on the outcomes of the monitoring of land in Slovakia it has been shown that the average values of organic carbon within the arable land (AL) horizon of the same soil types are significantly lower than those on permanent grassland (PG), This condition has been the result of long-term intensive mineralisation on AL during the ploughing of pastures along with a long-term tilling of the arable land. Mollicfluvisols on arable land show the highest SOC values, while pseudogley soils and brunisolic soils show the leat SOC values.

♦ 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 941 990 ha of agricultural land types in Slovakia.

Exchange of water erosion categories for the year 2012

Erosion categories	Water erosion	
	Land area in ha	% from Agricultural Land
No erosion or slightly	1 463 981	60.85
Medium	248 281	10.32
Strong	355 955	14.79
Extremely strong	337 753	14.04
Total	**2 405 971**	**100.00**

Source: SSCRI

Size of agricultural land types potentially impacted by wind erosion is 131 366 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.

Exchange of wind erosion categories for the year 2012

Erosion categories	Wind erosion	
	Land area in ha	% from Agricultural Land
No erosion or slightly	2 274 605	94.54
Medium	55 337	2.30
Strong	45 473	1.86
Extremely strong	30 556	1.27
Total	**2 405 971**	**100.00**

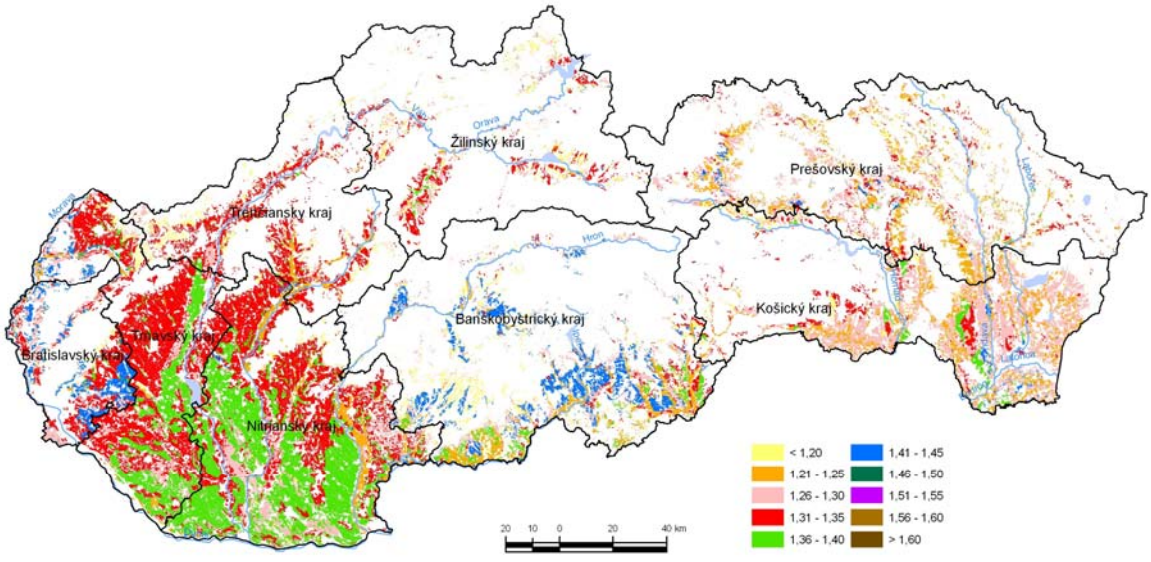
Source: SSCRI

♦ Soil compaction

Compaction of agricultural land represents a negative state that has been caused by the increase in volumetric weight. Compaction occurs as a consequence of faulty sowing and fertilizing procedures along with insufficient application of lime, and the incorrect use of agricultural machines. **Limit values of volumetric weigh of compacted soil** for individual soil types are published in **Act 220/2004 Coll.** on protection and use of agricultural land and on amendment to Act 245/2003 Coll. on integrated prevention and pollution control of the environment and on amendment and supplementation of certain laws.

State of the volumetric weigh within the arable land that contains the most part of the root system of plants categorised by the volumetric weigh (g.cm^{-3}) is shown by the following map.

State of the volumetric weigh of the land in the Slovak Republic on the basis of data of the last completed sampling cycle of soil monitoring - arable land



Source: SSCRI

• FLORA, FAUNA AND PROTECTED PARTS OF NATURE

Key questions and key findings

What is the state of endangerment of wild growing plant taxons?

- In the **90-ties** the red lists of Bryophytes and seed-bearing plants of Slovakia then valid contained 1 009 threatened and rare species. In the year **2001,** still valid red list of plants was published. The list categorizes as many as 3 057 species of plants into different threat categories (there have been added categories that were missing). Of this, threats to **non-vascular plants** represent **17.6%** and threats to **vascular plants** represent **42.6%.** In **2012**, preparation of red lists of threatened habitats, species of plants and animals was initiated for the whole Carpathian region.

What is the state of endangerment of the animal wildlife?

- In **the 90-ties** the valid red lists of animals contained altogether **466** threatened species of **invertebrates** and **153** species of **vertebrates.** The still valid red lists were published in **2001**. According to them, **2 058** species of **invertebrates** (**8.5%**) are threatened along with **257** species of **vertebrates** (**60.9%**). Increase in the numbers does not necessarily mean increased threats to species but rather their thorough knowledge and their consequent addition in the lists.

What is the trend in the network of protected areas in Slovakia?

- In the period of the years **1992 - 2012** in the legislation addressing nature protection and also protected areas was amended and revised on two occasions. Since 1955 **until 1994** there were categories of protected areas different than the ones that exist today. As of 1994, the overall number of declared **protected areas** was **922** with the size of **1 306 741 ha** (**26.7%** of the size of Slovakia). In 1994, a new act on nature and landscape protection revised the categories of protected areas. Currently, in Slovakia there are **1,128 protected areas** within the national network in the size of **1 142 151 ha,** which takes up **23.3%** of the size of Slovakia. Reduction has been mainly provoked by cancelling PLA protective zones as well as adjustments to "large-size" protected areas (NP and PLA). **From 2011 to 2012,** the situation with "large-size" PA (protected areas) has not changed. In the case of so-called "small-size" PA there was an increase by 14 areas (i.e. by 3 578 ha).

What is the trend in the number of protected trees?

- Since **2004** until 2012 there were **declared 15** protected trees (PT) and **49 were removed,** which **reduced** the number to **446** (mainly due to the extinction of the object to be protected). Compared to the previous year, there has been a reduction by 2 PT (from the category of "degraded").

Flora

♦ Monitoring of plant taxons

Monitoring of 35 plant species of the European importance was carried out at about 200 localities in 2012.

♦ Endangerment of wild growing plant taxons

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

Overview of endangerment for individual plant taxons

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

Source: SNC SR

Level of **endangerment of non-vascular plants** in Slovakia is presently **17.6%** (including fungi), or 11.3% (for the CR, EN, and VU categories). Level of **endangerment of vascular plants** is **42.6%**, or **30.3%** (for the CR, EN, and VU categories).

Recently, preparation of **red lists** started within the BioREGIO Carpathians project funded from a South-Eastern Europe international programme. Updated national lists will become the basis for the whole-Carpathian red lists.

Comparison of the vascular plant endangerment* in selected countries

	Slovakia	Austria	Hungary	Poland	Czech Rep.
Vascular plants (%)	30	33	7	11	42

Source: OECD

* Among "endangered" taxons are those taxons classified under categories: CR, EN, and VU under IUCN.

♦ Protection of plant species

Number of the **state protected species** is now **1 419** (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 1 419 protected species, **823 species** 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

* The entire genus *Sphagnum*, excluding *Leucobryum glaucum*

Source: SNC SR

** The entire genus *Lycopodium*, excluding *Artemisia eriantha*, *Galanthus nivalis*

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
New reporting for the European Commission for the years 2007 - 2012 will take place in 2013

Within the implementation of **transfers** of endangered plant species, there was a transfer of 21 individual plants within 5 species (*Fritillaria meleagris, Onosma visianii, Pulsatilla grandis, Adonis vernalis, Campanula xylocarpa*). Total costs of the transfers reached approximately 199 EUR.

In 2012, no drafted **rescue programmes** were submitted for approval. There were implemented rescue programmes for 9 species of vascular plants (*Liparis loeselii*, *Tephroseris longifolia* ssp. *moravica*, *Herminium monorchis*, *Spiranthes spiralis*, *Drosera anglica*, *Radiola linoides*, *Lycopodiella inundata*, *Alkanna tinctoria* and *Colchicum arenaria*).

♦ Invasive plant species

In 2012, the total of 85 sites of invasive plant species of the size of 662.5 ha, and 106 sites of areas with the first degree of protection of the size of 565 ha were **mapped** all over the protected areas or their protective zones.

Protection of natural species living in ecosystems has been performed through **regulating the occurrence** of non-native plant species. Elimination of the non-native invasive and invasive-like plant species was carried out at 145 sites (94 sites in protected areas, 51 sites out of protected areas). Interventions were carried out in the area of 1 201.5 ha (89.21 ha in protected areas and 1 112.28 ha out of protected areas).

In 2012, the **National strategy for invasive non-native plants** was **revised**. The issue of invasive species at the same time became part of the drafted revised National biodiversity strategy in the Slovak Republic for the years 2012 - 2020.

Overview of the most spread invasive plant species

	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

♦ Monitoring of animal species

Monitoring of animal species involved the monitoring of **nest/nesting boxes occupancy** and the monitoring of the **nests of the bird of prey.** Monitoring the number of **dead birds** under electricity poles within the monitored routes was continuously performed, along with monitoring of the effectiveness of the adopted technical measures. Functionality of the existing **fish passes** was monitored at water courses. Slovak Caves Administration carried out monitoring of **bats** in 15 caves.

♦ Endangerment of animal wildlife

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	136	49.1
Aranea	30 000	934	16	73	90	101	97	45	-	422	45.2
Ephemers	2 000	132	-	8	17	16	-	-	-	41	31.1
Odonata	5 667	75	4	-	14	11	13	5	-	47	62.7
Orthoptera	15 000	118	-	6	7	10	20	10	-	53	44.9
Heteroptera	30 000	801	-	14	7	6	4	-	-	31	3.9
Coleoptera	350 000	6 498	2	15	128	490	81	2	-	718	11.1
Hymenoptera	250 000	5 779	-	23	59	203	16	-	-	301	5.2
Lepidoptera	100 000	3 500	6	21	15	41	17	11	-	111	3.2
Diptera	150 000	5 975	-	5	10	71	19	93	-	198	3.3

* without the category of NE Source: SNC SR

Endangerment of invertebrates in Slovakia is now about 8.5% (or **6.4%** just within CR, EN and VU categories). For **vertebrates**, 60.9% 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	-	-	59	74.7
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	102	46.6
Mammals	4 763	90	2	2	6	12	27	15	4	64	71.1

* without the category of 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

In **the 90-ties,** red lists of animals contained altogether **466** threatened species of **invertebrates** and **153** species of **vertebrates.** Revised red lists were published **in 2001.** They list **2 085 threatened invertebrates** and **257 species of vertebrates** today. Increase in the numbers does not necessarily mean increased threats to species but rather their thorough knowledge and their consequent addition to the lists (especially in invertebrates).

In **2012**, **preparation of red lists** of threatened animals **for the whole Carpathian region** was started. It involved works of experts on the assessment of selected animal categories - Molluscs, Spiders, Malacostraca, Dragonflies, Day butterflies, Lampreys, Fishes, Amphibians, Reptiles, Birds and Mammals.

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

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**	-	-	-	-	129	-

[1] including migratory birds

Source: SNC SR

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
New reporting for the European Commission for the years 2007 - 2012 will take place in 2013

Source: MoE SR

♦ Care of protected and threatened animal species

In 2012, no new animal **rescue programmes** were drafted. 3 rescue programmes were processed (for *Bison bonasus, Castor fiber* and butterflies of *Maculinea* genus).

In **rehabilitation stations** operated by the nature and landscape protection organizations there were **adopted** in 2012 altogether **812** injured individuals or otherwise disabled animals (165 animals more than in 2011). Back to wild nature there were **released** altogether **474** individuals (increase by 88 animals).

In 2012, **guarding** of 97 nests of 6 bird of prey species (*Aquila chrysaetos*, *Aquila pomarina*, *Aquila heliaca*, *Haliaetus albicilla*, *Falco peregrinus*, *Buteo buteo*) within the SNC SR organisation units was provided. There were successfully **brought up 85 nestlings**. Financial costs for guarding the nests of the bird of prey achieved more than 3 000 EUR.

In term of in situ animal preservation in 2012 there were organized **transfers** of frogs and bats and **restitutions** of *Rhodeus sericeus* into proper nature biotopes by nature and landscape protection organizations.

In the area of practical care of the protected animal species, State Nature Conservancy of the SR 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, **81 246 of amphibians were carried over** in 2012 (this was 16 thous. more than in the previous year) and 16 846 m of barriers were installed, which is an increase by 106%.

♦ Game stock and hunting and fishing

In 2012, it was possible to stop the undesirable growth in **spring stock** of the ungulate game. The number of almost all animal species was stabilised. Hunting for the rare animal species is strictly regulated.

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

Species	2009		2010		2011		2012	
	stock	hunting	stock	hunting*	stock	hunting	stock	hunting*
Deer	46 207	18 854	51 856	19 374	58 106	22 157	58 932	24 010
Fallow deer	10 511	3 654	11 240	4 214	12 831	4 984	13 027	5 747
Roe deer	96 650	27 035	100 080	22 382	110 943	23 658	110 989	23 960
Wild boar	31 652	31 473	34 577	38 903	37 092	36 390	37 667	49 997
Brown hare	205 028	32 570	196 994	11 965	177 747	13 219	176 783	14 207
Wild duck	-	-	-	-	0	10 743	53 791	19 797
Grey partridge	12 562	342	10 956	419	9 199	450	6 590	782
Pheasant	200 863	115 730	186 494	88 694	162 986	77 063	168 538	79 369
Chamois	882	11	823	0	745	0	827	0
Bear	1 940	27	2 001	47	2 067	8	2 080	47
Wolf	1 698	130	1 823	149	2 065	118	2 006	149
Northern lynx	1 558	0	1 616	0	1 724	0	1 667	0
Catamount	2 480	0	2 715	0	2 963	0	3 191	0
Moorcook	1 343	1	1 211	0	1 260	0	1 232	0
Wood-grouse	1 011	0	902	0	814	0	835	0
Beaver	-	-	-	-	1 767	2	1 851	0

* Actual hunting in numbers, excluding other kills

Source: SO SR, NFC

In 2012, amount of the fish **caught** in the fish ponds, water dams and water flows for economic and sport purposes again increased, compared to the previous year and achieved **3 232 t**. The waters were **stocked** by **43 171 869 pieces of setting**, which shows a reduction by 13.3% compared to 2011.

Overview of fishing for the economic and sport purposes (t)

Fish species	2009		2010		2011		2012	
	total	of this SFA*	total	of this SFA*	total	of this SFA*	total	of this SFA*
Fish total Of these:	**2 584.2**	1 751.5	**2 295.9**	1 596.3	**2 750.4**	1 921.3	**3 232.1**	1 925.7
Carp	1 394.6	1 235.4	1 275.7	1 151.9	1 621.0	1 421.5	1 773.6	1 404.5
Trouts	698.6	58.4	608.8	55.9	638.8	60.3	830.2	61.5
Crucians	76.0	70.4	51.9	50.2	56.8	51.9	81.0	58.1
White amur	61.5	50.2	39.9	34.9	82.4	61.1	71.6	62.3
Bighead carps	14.4	4.5	11	3.1	5.9	5.5	122.3	9.0
Sheat fish	40.2	39.1	36.6	35.2	49.3	47.3	62.5	56.5
Maskalonge	51.1	50.6	52.4	51.5	70.1	61.5	55.9	54.0
Sand-eel	62.2	61.5	62.1	61.7	56.6	54.5	53.0	50.3
Grayling	5.9	5.8	3.9	3.3	4.2	4.2	2.0	5.8
Huchen	0.5	0.5	0.4	0.4	0.9	0.9	0.6	0.6
Breams	81.6	81.6	65.6	65.5	65.5	65.5	87.0	74.5
Torgoch	2.2	0.8	2	0.0	7.1	0.1	6.1	0.5
Chevins	13.9	13.9	11.6	11.6	12.5	12.5	14.2	14.2
Other fish species	81.5	78.7	74	71.1	19.2	15.7	19.2	16.9

SFA – Slovak Fishing Association

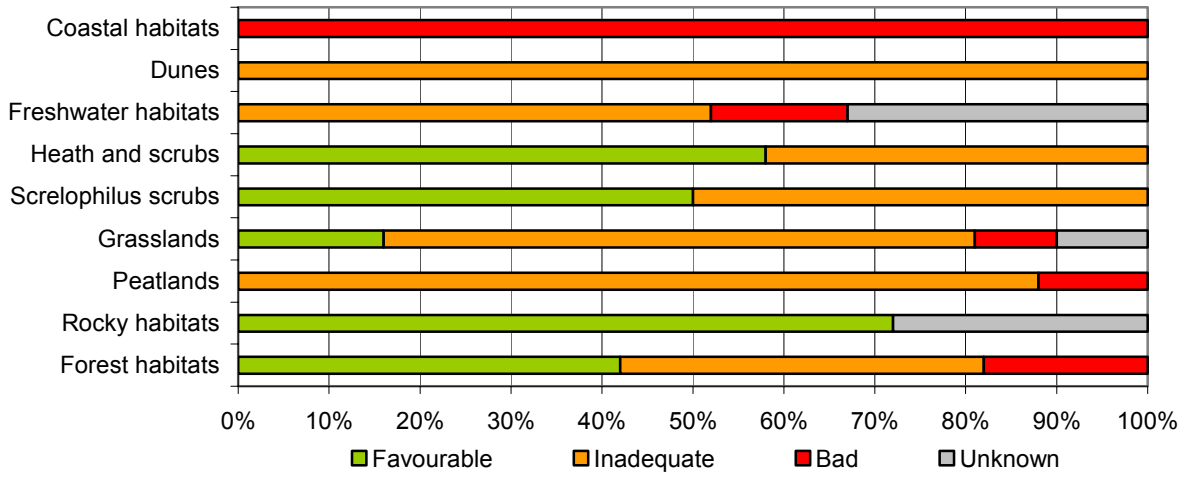
Source: SO SR

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.

Systematic **monitoring of habitats** in Slovakia was not carried out. However, it was to be implemented within the framework project under the Operation programme of Environment.

Conservation of the state of habitats of the European importance*



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

Source: SNC SR

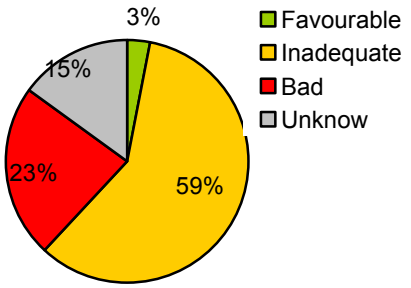
In 2012, management measures were implemented to **improve the favourable state of habitats** and plants at 137 sites within protected areas on total size of 379.95 ha, excluding protected areas at 53 sites (gene pool areas) taking up the size of 44.1 ha.

♦ Wetlands

Biodiversity of wetlands is more threatened than biodiversity of terrestrial ecosystems. Wetlands are becoming more and more **threatened** as a consequence of mainly intensive agricultural practices, meliorations, eutrophication, landscape fragmentation, changes in water balance. Also, traditional management approaches to meadows (scything) have been abandoned, which results in excessive vegetation growth of wetlands and peat bogs. Water courses have been locally contaminated or suffer from the consequences of past regulation activities. Construction of new hydro-electric power plants leads to the fragmentation of river habitats.

On the basis of the assessment for the European Commission, Slovakia is known to have 24 types of habitats of European importance that are classified as water, river, wetland, or dependent on the aquatic environment. All over Europe, 85% of wetland habitats are in **unfavourable state**. Slovakia has a similar situation.

State of wetland-type habitats



Source: SNC SR

State of wetlands in Slovakia

	Number of sites	Area (ha)	% of SR territory
Wetlands of international importance	18	41 704	0.9
of which Ramsar sites	14	40 697	0.8
Wetlands of national importance	72	147 260	3.0
Wetlands of regional importance	467	10 431	0.2
Wetlands of local importance	1 050	4 550	0.1
Total	**1 607**	**203 945**	**4.2**

Source: SNC SR

In 2011, a draft of **Action plan for the years 2012-2014** was produced and subsequently approved. This document accompanied the revised **Slovak Wetland Management Programme for the years 2008-2014.**

Ecosystem services, ecological footprint

Assessment of ecosystem services **has been performed** in the national park of Slovenský raj. Partial assessments of ecosystem services have been produced for selected forest ecosystems. **In 2012**, assessment in the national park of Muránska planina began.

"To preserve and renew ecosystems and their services by 2020" belongs to the objectives of the new EU biodiversity strategy. In the same context, the Slovak Ministry of Environment initiated workshops with the pertinent institutions that resulted in drafting the LIFE+ project for ecosystem accounting.

Care of the protected nature parts

♦ Implementation of law and strategic activities within the area of biodiversity conservation

CITES

Slovak Ministry of Environment acting as the **executive body of the CITES Convention** in 2012 published **370 exceptions** from the ban of commercial activities pursuant to Council Regulation (EC) no. 338/97 of 9th December 1996 on the protection of species of wild fauna and flora by regulating trade therein, **3 permissions** to relocate live animals, **133 permits to import** and **63 permits to export.** The most frequently imported products are leather bands for wristwatch made of crocodile (Mississippi alligator) and other reptiles' skin. Besides, in 2012 several parrots were imported, along with trophies (brown bear, leopard, and cheetah), etc.

State Nature Conservancy of the SR acting as **scientific CITES body** in Slovakia assisted customs authorities, police, and inspections (identification of individual animals, assessment of social and customs values of individual animals).

Cooperation with the police improved significantly in 2012. Customs authorities were **successful for the first time** in tracing and identifying illegal import of 2 deliveries of Asian medicine that contained endangered species. In 2012, the Slovak Ministry of Environment distributed information pamphlets for the public (tourists) crossing the customs border points.

Strategic documents

Preparation of the revised National Biodiversity Strategy for the next period continued in 2012. On the basis of the outcomes of the 10th session of the Conference of the parties to the Convention on Biological diversity in Nagoya in Japan and the adopted revised Strategic plan for biodiversity 2011-2020 and strategic targets (Aichi biodiversity targets) as well as the targets and measures of the EU Biodiversity Strategy to 2020 of May 2011. **Direction** in biodiversity conservation as compared to the strategy from 1997 has been **supplemented** especially with reactions to the new threats and trends in biodiversity conservation over the past years, and the reaction to the implementation of selected EU strategies that impact biodiversity and began to be seen only after Slovakia entered the EU.

♦ Protected minerals and fossils

The list of **protected minerals** includes:

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

The list of **protected fossils** includes:

- 655 typological fossils that represent an irreplaceable, unique material of extinct plants and

animals that served to describe the specific taxonomic group for the first time,

– selected groups of fossils with rare occurrence that thanks to their characteristics and degree of preservation are unique testimonies of the evolution of organisms in the Slovak geological past.

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

♦ Protection of caves

There are **more than 6 691 caves** registered in Slovakia. They are natural monuments at the same time. Of these, 44 most significant were classified among the national natural monuments.

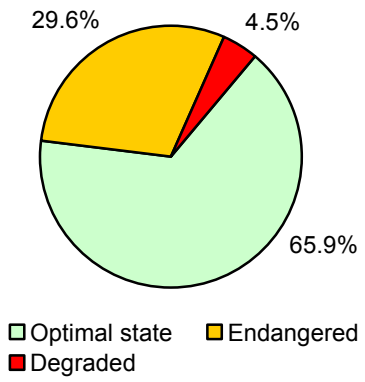
Presently, there are **18 accessible caves**. Total number of **publicly accessible caves** grew to **41**.

♦ Protected trees

The network of protected trees (PT) in 2012 was created by **446 protected trees** and their groups including alleys - protected objects (2 PT less than in the previous year). Physically it is represented by 1 256 solitary trees of 65 taxons, including 32 domestic and 33 alien taxons.

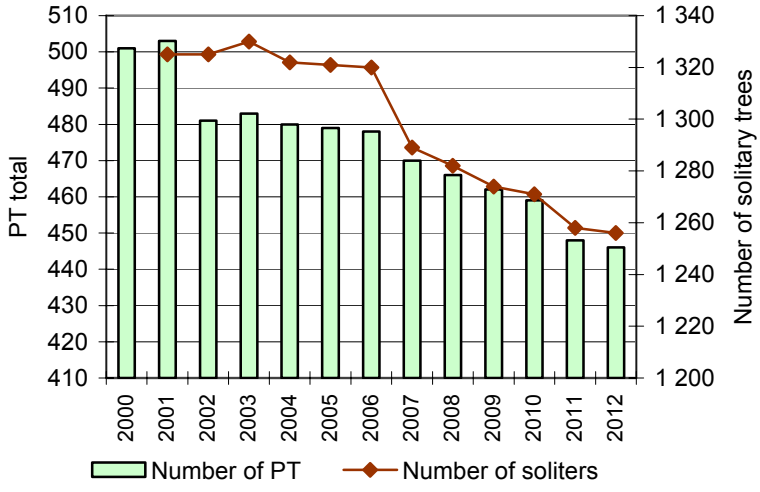
There were 294 in the **optimal** state, 132 were **endangered** and 20 **degraded** of the protected trees and their groups. This is stagnation in the situation, compared to the previous year.

State of protected trees and their groups



Source: SNC SR

Trend in number of protected trees



Source: SNC SR

♦ Protected areas

Legal protection of protected areas

15 new "small-size" protected areas were declared in 2012 of total size of 3 250 ha (including 12 PS, 2 NR a 1 NM). All of the areas belong to the Natura 2000 network under the Sites of Community Importance. A **decree was published** on declaring the **most recent Special Protection Area -** Levočské vrchy.

Policies regarding **9 protected areas** have been **updated.** Besides, decrees were also published on declaring other 5 nature monuments - publicly accessible caves and 1 more NM.

Decrees on **repealing 6 protected areas** (5 PS and 1 NR) came into effect.

Overview of the national network of protected areas

Overview of protected areas in the SR – in categories of PLA and NP

Category	Number	Size of core area (ha)	Size of protective zone (ha)	% of SR territory (incl. PZ)
Protected landscape areas (PLA)	14	522 582	-	10.66
National parks (NP)	9	317 890	270 128	11.99

Source: SNC SR

Size of all so-called **"small-size" protected areas (SSPA)** including their protective zones (PZ) takes up **2.44%** of Slovakia's territory. This represents an increase by 14 areas (3 578 ha or 0.07% of Slovakia's territory) compared to the previous year.

Overview of protected areas in the SR – in categories of PLA and NP

Category	Number	Size of core area (ha)	Size of protective zone (ha)	% of SR territory (incl. PZ)
Protected landscape fragments	1	3	-	0.00
Protected sites	173	11 023	2 425	0.27
Nature reserves (including 2 private)	392	14 246	301	0.30
National nature reserves	219	84 189	2 239	1.76
Natural monuments (without caves and waterfalls)	218	1 586	207	0.04
Natural monuments - publicly accessible caves	35	0	31	0.00
Natural monuments - other declared caves	7	0	261	0.01
Natural monuments - natural waterfalls	0	0	0	0.00
National natural monuments (without caves and waterfalls)	11	59	27	0.00
National natural monuments - caves	44	0	3,055	0.06
National nature monuments - natural waterfalls	5	0	0	0.00
SSPA total	**1 105**	**111 105**	**8 545**	**2.44**

Source: SNC SR

Besides the already mentioned objects, there are in Slovakia also territories that **are not classified under protection levels** - 40 declared **special protection areas** with total size of 1 237 213 ha, and 20 **caves** (14 NNM and 6 NM) with declared protective zone of total size of 3 347 ha (major part of their territories reaches into other protected areas).

In total, **in the territory of PLA** there are **247** SSPA (this represents 2.4% of total PLA territory, incl. their PZ), **in the territory of NP** there are **209** SSPA (**22.8%** of the NP area, incl. their PZ), while **in the territory of NP protective zones** there are **68** SSPA (**0.9%** of the NP protective zones area).

Outside PLA, NP, and PZ of NP, which means **the open landscape**, there are **581** SSPA (0.9% of the open landscape area and 27% of total SSPA territory, incl. their PZ).

Agricultural land (AL) and forest land (FL) in protected areas

	Size of AL (ha) in PA*	%	Size of FL (ha) in PA	%
2012	187 190	16.4	830 330	72.7

*only permanent grasslands according to LPIS (inventory of actively used agricultural land)

In the period of the years 1993-2012, legislation addressing nature protection and also protected areas was amended and revised on two occasions. Since 1955 until 1994 there were categories of protected areas different than the ones that exist today. **As of 1994**, the overall number of **protected areas** was **922** with the size of **1 306 741 ha** (**26.7%** of the size of Slovakia). Currently, in Slovakia there are **1 128 protected areas** within the national network in the size of **1 142 151 ha,** which takes up **23.3%** of the size of Slovakia. Reduction has been mainly provoked by cancelling PLA protective zones as well as adjustments to "large-size" protected areas (NP and PLA).

Overview of protected areas in the SR by types and levels of protection (as of 31.12.2012)

Level of protection*	Category	Area (ha)	% of SR territory
1th level	„ open landscape “	3 761 249	76.70
2th level	PLA**, NP PZ**, D zones	759 917	15.50
3th level	NP**, PS, PS PZ, NR PZ, NNR PZ, NM PZ, NNM PZ, C zones	269 992	5.51
4th level	NNR, NR, NNM, NM, PS, NR PZ, NNR PZ, NM PZ, NNM PZ, B zones	18 833	0.38
5th level	NNR, NR, NNM, NM, A zones	93 409	1.91

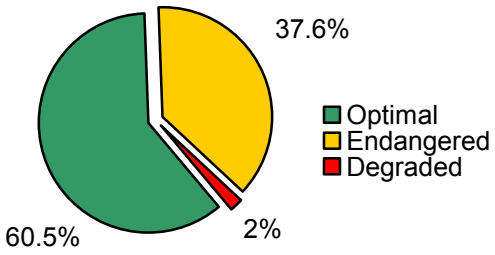
Source: SNC SR

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

Endangerment and degradation of protected areas

Of the total number of 1 105 small-size protected areas, there were **degraded** 22 territories of area of 276 ha (this area presents 0.2% of total area of SSPA), 415 were **endangered** of area of 20 161 ha (16.9% of SSPA) and in the **optimal condition** there were 668 territories of area of 99 213 ha (82.9% of SSPA). Compared to the previous year, a slight improvement has been recorded, since 2003.

Endangerment of SSPA in terms of their number



Source: SNC SR

Care of protected areas

Professional nature protection organisations carried out **regulatory intervention** in the field of practical care of the specially protected nature and landscape parts - major activities included mowing and mulching, together with elimination of self-seeded trees.

State Nature Conservancy of the SR elaborated 9 241 **expert viewpoints**. The biggest rate was created by the department of tree species protection (18.9%) and building and regional planning activities (18.5%).

As of 2012, **71 education paths**, **49 education localities and 13 information centres of nature protection** were documented (only within the State Nature Conservancy of the SR organisation units).

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:

- Poľana biosphere reserve (1990)
- Slovak karst biosphere reserve (1977)
- East Carpathian biosphere reserve (1998) (trilateral BR: Poland/Slovakia/ Ukraine)
- Tatra biosphere reserve (1992) (bilateral BR: Poland/Slovakia).

As of 2012, **14 wetlands** were declared and registred in *List* of *Wetlands* of International Importance as **Ramsar sites** with total size of **40 697 ha** (0.8% of SR territory) 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

Source: SNC SR

Review of Biosphere Reserves and Ramsar sites in selected countries

		Slovakia	Czech Rep.	Poland	Hungary	Austria
Biosphere Reserves (BR)	Number	4	6	10	6	7
Ramsar sites	Number	14	14	13	29	22
	area (km^2)	407	603	1 451	2 449	1 239

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

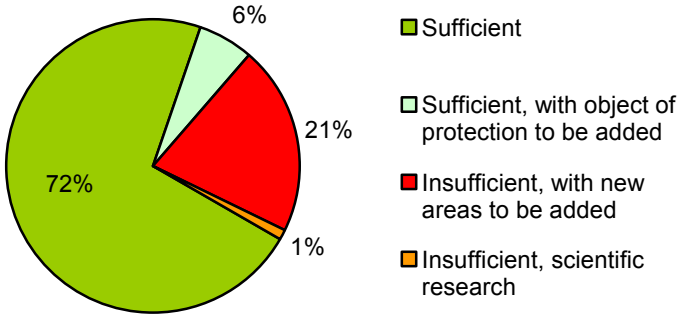
Source: SNC SR

NATURA 2000 in Slovakia

Sites of Community Importance (SCI)

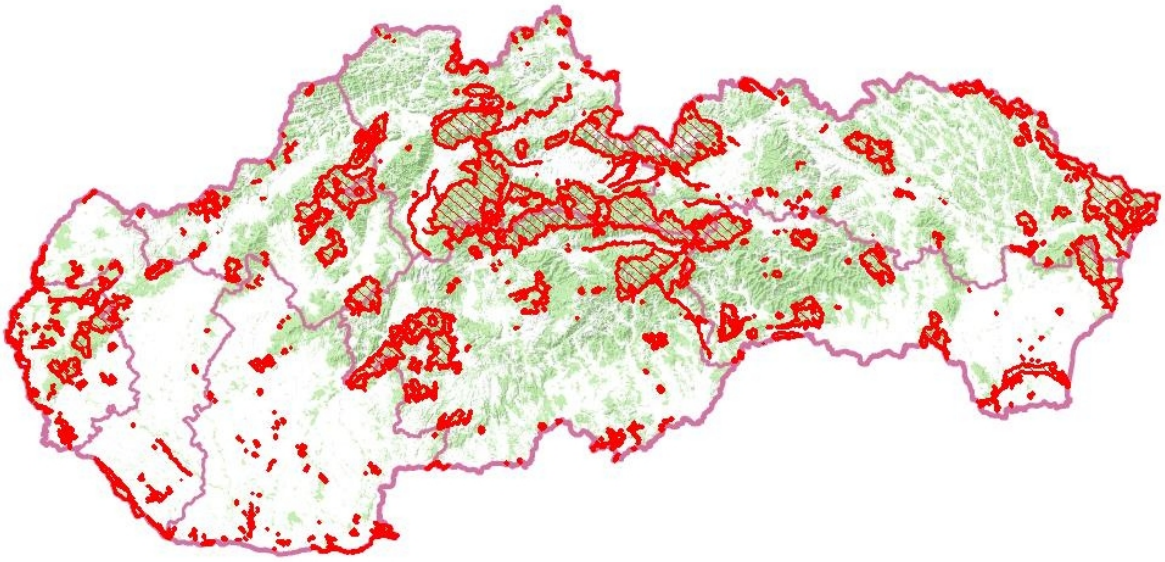
- National list of SCI was approved on 17.3.2004 by the Slovak Republic government and published *on the basis of the MoE SR Edict* of July 14, 2004 and was sent to the European Commission for approval;
- SCI are proposed for **44 plant taxons**, **96 animal species** and **66 types of biotopes**;
- 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%**;
- In 2011, first **enlargement of the SCI national list** of 2004 was implemented. On the basis of the EC requirements stemming from the outcomes of bio-geographical seminars as well as the Slovak Government Resolution No. 577 of August 31, 2011, **97 new sites** were added to the national list of European importance. At the same time, **6 original areas were excluded** from the national list. **Total share of SCI** on the size of Slovakia **grew** from 11.7% to **11.9%.** Relevant **total number of SCI** is **473 areas** of the size of **584 353 ha**;
- **Negotiations with the EC** took place in Bratislava in **March of 2012** in the presence of independent experts from the Slovak Academy of Sciences, non-government organisations, State enterprise Forests of the Slovak Republic, National Forest Centre, and private forest owners. Negotiations centred around the **level of sufficiency in demarcation of sites of community importance.** The negotiations showed that for **approximately 78% of species and habitats** of the European importance, there is **sufficient number of sites of community importance.** In the years to come, however, new **sites** will have to be added also for the remaining habitats and species, **especially the fish**;
- The process of **declaring new SCI** continued in the national categories of protected areas (especially PS or NR). Areas should be declared within 6 years following their approval by the EC, which in the case of the SCI submitted in 2004 is by November 2013 or January 2014 respectively. **Less than 60%** of these sites were **declared** in 2012. Among the declared areas were 15 new "small-size" protected areas of the size of 3 250 ha (12 PS, 2 NR, and 1 NM) that are at the same time sites of community importance, and still others are to be completed or legally approved.

Sufficiency of demarcation of sites of community importance expressed by the number of species and habitats



Source: SNC SR

Updated overview of Sites of Community Importance in the SR

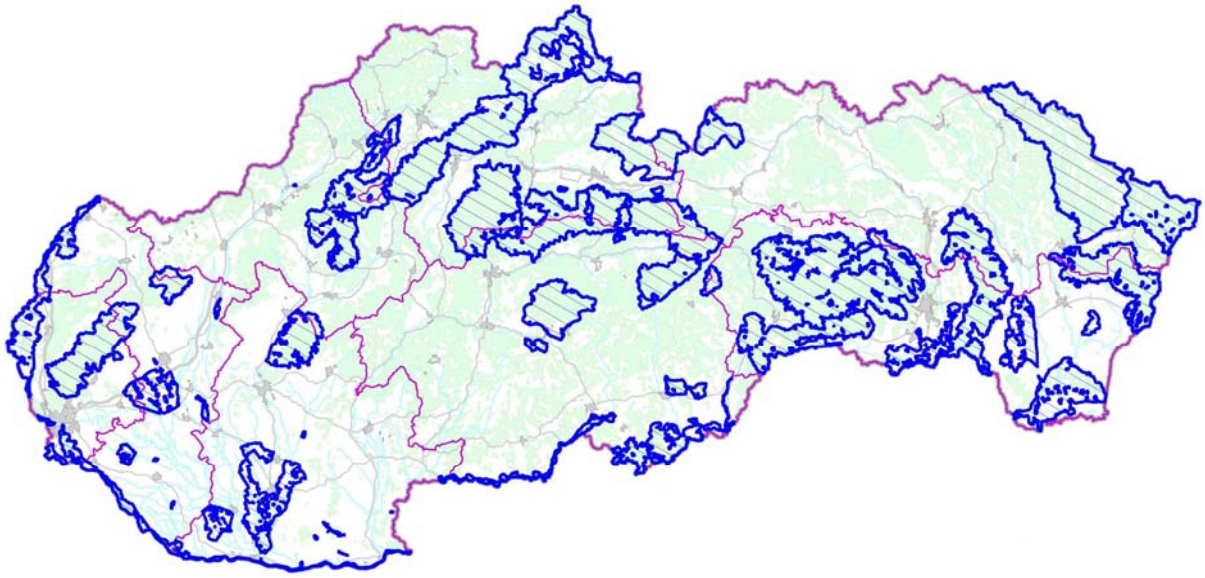


Source: SNC SR

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**;
- **In 2012 was declared also the last** territory belonging to the national list of **41 SPA. Size** of all SPA reached the size of **1 282 811 ha,** which is **26.16%** of Slovakia's territory.

Updated overview of 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	41	1 282 811	365 102	28.4	828 110	64.3
SCI	473	584 353	58 640	10.0	503 926	86.2

Source: SNC SR

URBAN AND RURAL ENVIRONMENT

• SPATIAL DISTRIBUTION AND FUNCTIONAL USE OF TERRITORY

Key questions and key findings

What are the trends in demographic development and urbanisation?

- **In 2012, natural increase of population reduced significantly. Changes from year to year did not produce any deviations in already started demographic trends that have resulted, over the last 10 years, in reduced live birth rates and positive mortality trend. This has impacted the process of ageing significantly. Slovak population is ageing at an increasing speed. Compared the year 2012 to the demographic trend in 1993, the year 2012 has been characteristic for higher average age if men and women, as well as the average life expectancy at birth. From the perspective of urbanisation, proportion of urban population in Slovakia declined from 56.8% in 1991 to 56.2% in 2000, and further to 54.3% in 2012.**

What is the trend in the structure of lots and surfaces in Slovakia?

- **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 2012 being characteristic for further loss of agricultural and arable land types and increasing forest land.**

Settlement and demographic trend

As of **December 31, 2012,** there were **5 410 838 inhabitants** in Slovakia, of whom 51.3% were women. In 2012, there was a significant decline in the natural increase of population, reaching the value of **3 098,** which was by 5 812 people less than in 2011. Slovakia gained 3 416 persons through international migration, which is 450 persons more than in the previous year. **Total increment** in population reached **6 514 persons**, which is 5 326 less than in 2011.

In 2012, no major changes between individual years occurred in Slovakia's demographic trend. Slovak population is continues ageing at an increasing speed.

Basic data about the migration of population in the SR (2012)

Territory	Live births	Dead	Natural increment (loss)	Migration increment (loss)	Total increment (loss)	Number of inhabitants
Bratislavský region	7 518	5 747	1 771	4 374	6 145	612 682
Trnavský region	5 273	5 443	-170	1 238	1 068	556 577
Trenčiansky region	5 145	5 771	-626	-401	-1 027	593 159
Nitriansky region	6 004	7 687	-1 683	519	-1 164	688 400
Žilinský region	7 208	6 469	739	-219	520	690 121
Banskobystrický region	6 022	7 008	-986	-652	-1 638	658 490
Prešovský region	9 501	6 863	2 638	-1 062	1 576	817 382
Košický region	8 864	7 449	1 415	-381	1 034	794 025
Slovak Republic	**55 535**	**52 437**	**3 098**	**3 416**	**6 514**	**5 410 836**

Source: SO SR

Of all the regions, most inhabitants live in the Prešovský region, least in the Trnavský region.

Structure of the settlement in the SR (2012)

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	2 052.6	298.5	73	8 392.9	81.0	19.0
Trnavský region	4 146.4	134.2	251	2 217.4	47.6	52.4
Trenčiansky region	4 502.0	131.8	276	2 149.1	56.2	43.8
Nitriansky region	6 343.8	108.5	354	1 944.6	46.0	54.0
Žilinský region	6 808.6	101.4	315	2 190.9	49.3	50.7
Banskobystrický region	9 454.3	69.6	516	1 276.1	53.3	46.7
Prešovský region	8 973.4	91.1	665	1 229.1	47.8	52.2
Košický region	6 754.5	117.6	440	1 804.6	56.1	43.9
Slovak Republic	**49 035.6**	**110.3**	**2 890**	**1 872.3**	**54.3**	**45.7**

Source: SO SR

Index trend in the SR area structure

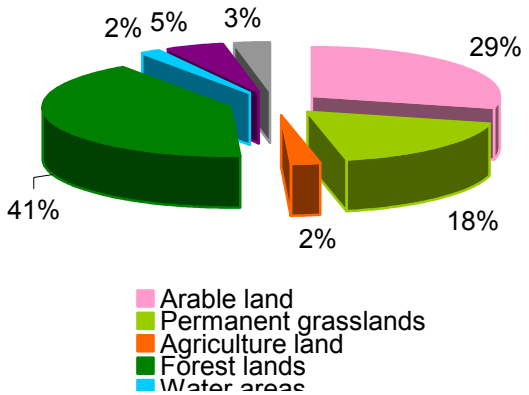
Trend in the structure of lands of Slovakia in 2012 was affected by further **loss of agricultural land types and arable land types,** giving way to forest land, non-agricultural, and non-forested land types, and by growth in forest land. Loss of agricultural land in 2012 (-4 841 ha) when compared with 2011 (-3 479 ha) is smaller by 1 362 ha. Loss of arable land in 2012 (-1 914 ha) when compared with 2011 (-980 ha) is greater by 934 ha. Increment of forest land in 2012 (1 723 ha) when compared with 2011 (1 086 ha) is greater by 637 ha.

Overall land categories to 31st December 2012 (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	72 553	.	4 504	4 587	781	9 236	91 661	75 121	5 820	16 434	16 228	205 263
TT	259 583	126	4 189	8 354	2 462	14 822	289 537	65 249	15 773	28 979	15 102	414 639
TN	97 298	352	83	8 120	2 524	75 287	183 665	221 776	6 374	23 761	14 622	450 197
NR	405 478	37	11 914	14 108	4 900	30 369	466 805	96 613	15 735	38 099	17 127	634 379
ZA	60 701	.	.	6 044	395	176 851	243 990	380 648	12 816	25 783	17 622	680 859
BB	165 516	.	3 324	11 032	1 848	232 239	413 959	464 487	7 988	33 552	25445	945 431
PR	148 691	·	23	10 820	1 926	219 434	380 895	442 159	13 932	31 838	28 514	897 337
KE	203 918	·	2 926	13 504	2 024	113 086	335 458	268 007	16 328	34 155	21 503	675 451
Spolu	**1 413 739**	**515**	**26 964**	**76 568**	**16 861**	**871 324**	**2 405 971**	**2 014 059**	**94 764**	**232 599**	**156 163**	**4 903 557**

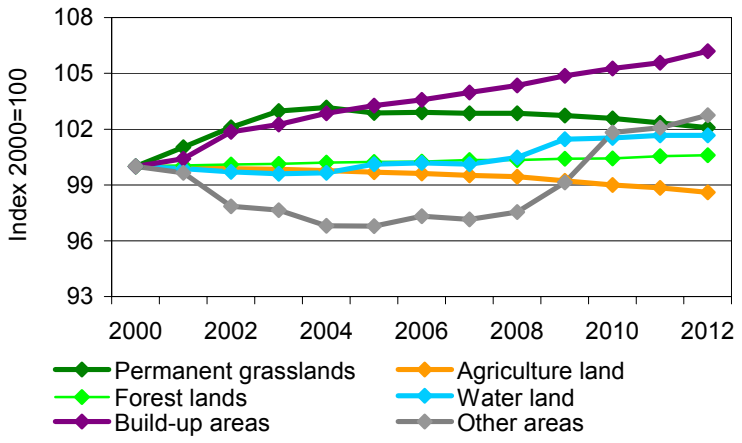
Source: IGCC SR

Areas structure in the SR (2012)



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.

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.

Every year, since 2006, the Ministry of Transport, Construction and Regional Development of the Slovak Republic has been supporting municipalities through subsidies for drafting their physical planning documentation pursuant to Act 226/2011 Coll. on subsidizing the process of creation of the physical planning documentation.

Following are the municipalities that receive **the subsidy**:

- 2006 total 1 mil. SKK (33 194 EUR) 7 municipalities
- 2007 total 1.9 mil. SKK (63 068 EUR) 16 municipalities
- 2008 total 7 mil. SKK (232 357 EUR) 32 municipalities
- 2009 total 7 mil. SKK (232 357 EUR) 36 municipalities
- 2010 total 170 000 EUR 24 municipalities
- 2011 total 364 267 EUR 45 municipalities
- 2012 total 468 398 EUR 103 municipalities.

• RURAL ENVIRONMENT

Key questions and key findings

How has the care for the rural environment been ensured?

- **Of all residential units in Slovakia, 95.2% are villages, with 45.7% of inhabitants living in the country.**
- **In 2012, 15th cycle of the Village Renewal Programme was implemented. Subsidies were given as part of the Programme, in the sum of 459 377.38 Euro for 122 subjects. The village of Oravská Lesná, winner of the Village of the Year national competition in 2011, represented Slovakia at The European Village Renewal Award competition in 2012. The village of Oravská Lesná made a very good impression and left with the European Village Renewal Prize for exceptional performance in individual areas of village renewal.**

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 2 890 residential units, 2 752 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 54.3% to 45.7%.

♦ Village Renewal Programme

Village Renewal Program (VRP), over fifteen 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 VRP builds on the process of 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. Slovak Environment Agency at performing its statutory activities under Resolution 222/1997, carries out the mentioned activities. The agency has been commissioned to administer the whole programme (processing applications, formal control, communication with the applicants, financial accounting), evaluate project applications, organize a national competition called The Village of the Year, and officially represent the Ministry of Environment in international bodies.

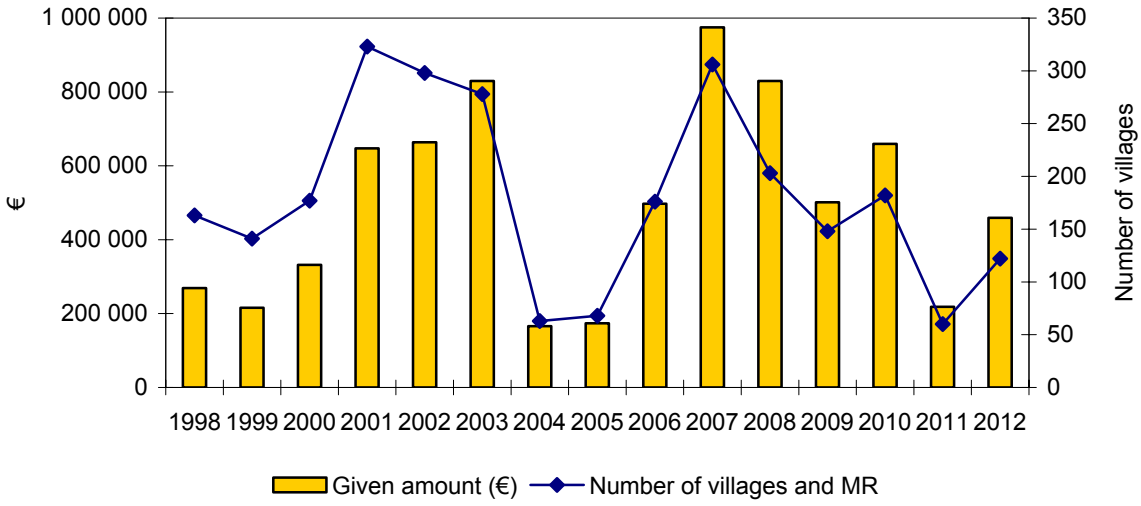
The VRP includes both, indirect support as well as funding from the State. In 2012, VRP support **reached the total value of 459 377.38 EUR**. Additional titles were adjusted so they take into consideration the interests of the Ministry of environment.

Total overview of allocating the subsidies in 2012

C8/ project documentations		C9/ small realizations		C10/ promotional, awareness-raising, and educational activities		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 (€)
17	65 280	62	219 817,38	9	45 480	34	128 800	**122**	**459 377.38**

MR* – micro-regions Source: SEA

Trend of allocating the subsidies to VRP



Source: SEA

Total **average subsidy per 1 applicant** was **3 765 EUR,** while the % of approved applications reached the value of **24.2%.**

♦ The Village of the Year competition

Every two years since 1990, European Working Community for Rural Development and Village Renewal 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, in 2004 it was the village of Hrušov in the district of Veľký Krtíš as the winner of the Village of the Year competition in 2003, in 2006 it was the village of Vlachovo in the district of Rožňava as the Village o the Year 2005, in 2008 it was the village of Liptovská Teplička in the district of Poprad as the Village of the Year 2007, in 2010 it was the village of Dobrá Niva, in the district of Zvolen as the Village of the Year 2009, and in 2012 it was the village of Oravská Lesná as the Village of the Year Dedina 2011.

The competition was declared by the Slovak Ministry of Environment, the Slovak Environment Agency, Society of the Renewal of Village, and the Association of Towns and Communities of Slovakia.

In 2012, the European Village Renewal Award was titled **On the track to the future** and hosted 29 European villages. The winner was a Swiss village called Vals, from the region of Graubünden. The village of Oravská Lesná made a very good impression and left with the "European Village Renewal Award for exceptional performance in individual village renewal areas".

• URBAN ENVIRONMENT

Key questions and key findings

How has the care for the urban environment been ensured?

- **In 2012, 54.3% of inhabitants lived in 138 towns and cities. The rest of the population lived in 2 752 villages. Environmental challenges have been mainly present in the cities, with a growing intensity from year to year. Cities and towns address the issue of environmental quality by implementing different strategies, programmes, and initiatives.**
- **In 2012, resolutions adopted at the 23rd session of the Steering Committee of the UN Habitat Programme in 2011 were gradually implemented into the strategies of individual signatory states. Resolutions have also been implemented for the Slovak Republic as one of the UN Habitat signatories.**

What is trend in the size of public green spaces in the Slovak Republic?

- **In 2011, the size of public green spaces in the Slovak Republic was 11 621 ha, which is 22 m^2 per capita. Compared to 1996, the trend suggests an increase by 532 ha (4.8%), while over the middle-term perspective (since 2000) the increase has been by 421 ha (3.8%). From year to year, there has been an increase in public green spaces by 141 ha following after the previous decline. On the contrary, proportion of park green spaces declined from a long-term perspective, while it grew again compared to 2010. Size of green area per capita has not changed over an extended time period or rose only by as little as 5%.**

Care of the urban environment

Inhabitants in towns and cities are forced to face more and more the consequences of deteriorated and even damaged environment, and these consequences impact their health. To help the cities and towns, the EC prepared a number of strategies and initiatives that look for the solution to environmental issues existing ad the regional and local levels.

Slovak cities and towns as part of the EU programming period were building the environmental infrastructure especially through the **Operation Programme of Environment.** Cities and towns had the possibility to participate in different initiatives for the support and protection of the environment, such as:

- **URBACT II.** with the goal to support cooperation in the area of urban development and strengthen the exchange of experience between European cities, in line with the Lisbon strategy.
- The **CIVITAS** initiative (since 2000) that supports the cities and towns from the funds of the framework programme for research and development and development and support of project funding focusing on environmental objectives, power industry, more effectiveness and more ecology friendly municipal transport.

- **Smart Cities** with the objective to encourage willing and able cities and towns to test new technologies and innovative solutions. It includes strengthening their competitive position to become more and more attractive for investors and professionals.
- **JESSICA** is a special assistance tool created to strengthen the efficiency of national and European sources for funding urban development and infrastructure through project support.

At the same time, Slovak towns and cities became involved in **European competitions and initiatives:**

- European Green Capital (Bratislava)
- European Capital of Biodiversity (Kremnica - capital of biodiversity of 2011, other cities include Prievidza, Zvolen, Trnava, Zábiedovo, Prešov)
- European Mobility Week (13 Slovak cities participated in 2012)

♦ UN Habitat

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.

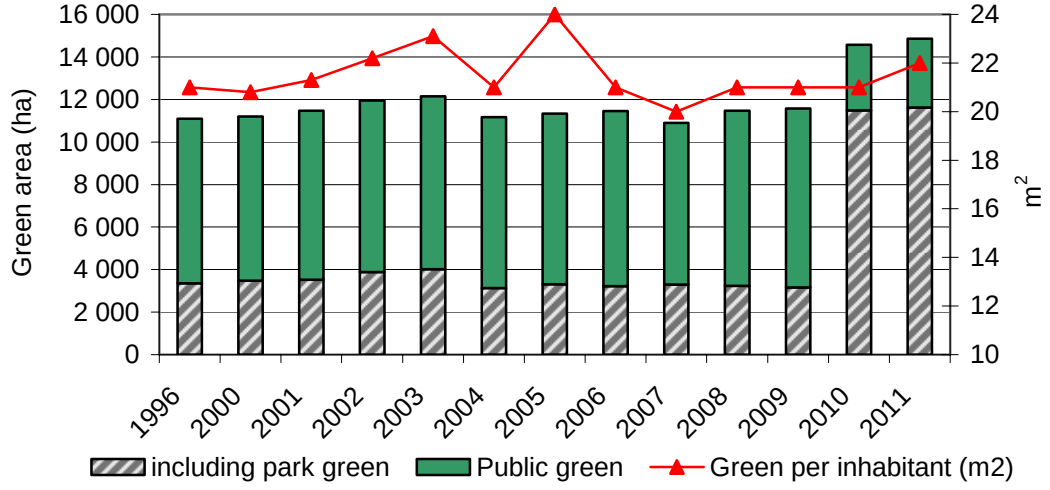
Slovakia has been actively participating in the UN HABITAT programme on the basis of its active registration. As a consequence of this, the country is obliged to transpose resolutions adopted at the steering committee sessions. Adopted resolutions will be included into ***National Action Plan for the Development of Settlements and Housing in the Slovak Republic*** and compliance is to be regularly assessed every two years.

Green in residential areas

Green in residential areas is considered the most effective, spatial, protective, healing, and decorative element. Basic **functions of municipal green areas** 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 **2011**, size of green areas in towns and villages in Slovakia was **11 621 ha,** which is 141 ha more than in 2010. Of this, park green was 27.8%. Share of public green per one inhabitant was **22 m^2**. Greatest size of public green spaces exists in the Nitra region, (also when calculated per capita), while the least number of public green spaces is in the Žilina region. Compared to 2010, size of public green spaces grew most in the Trnava region. On the contrary, the size has been declining in the Košice region and mostly in the region of Banská Bystrica.

Trend of public green spaces in the SR



Source: SO SR

• VALUE DIFFERENTIATION, LANDSCAPE PROTECTION AND CREATION

Key questions and key findings

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

- In 2012, the second annual **Award of the Slovak Republic for Landscape** took place. The awarded subject was **Čiernohorská železnica n.o.** */Čiernohorská railway non-government association/* with the winning project of **Rescue, renovation and operation of Čiernohorská railway in Čierny Balog.**
- Slovakia became the **presiding country** of the **Carpathian Convention** in 2011. In 2012, the country took part in the implementation of adopted protocols under the Convention through the committee for implementation of the Convention and through individual working groups. Works on the preparation of the Protocol on sustainable transport and relating infrastructure started. The works also involved preparatory activities for the 2. Carpathian Network of Protected Areas Conference (CNPA) in 2013 in Slovakia. Preparatory works also started regarding Strategy to the Protocol on sustainable tourism and Strategy to the Protocol on sustainable forest management Representatives of pertinent ministries and regions of Slovakia and Austria signed the Memorandum of Understanding for the protection of the Alpine-Carpathian corridor.
- There has been observed a long-term **increase in the number of national monuments** (by 31.2% compared to 1993, by 21.4% compared to 2000 and by 2.1% compared to the previous year) with a dominant share of architectural monuments. Share of the state as **the owner of these monuments** gradually declined from 23% in 1993 to 15% in 2000, and to 9.2% in 2012. However, it grew by 0.2% compared to the previous year. **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 2012.
- 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 to 2012.
- As of 2012, there were **3 managed territories of national geoparks**: the geopark of Banská Bystrica, the geopark of Banská Štiavnica, and the Novohradský geopark. **Activities of expert group** started and the Slovak Government **approved the Report on the implementation of the Slovak Geoparks Strategy.**

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 and cultural heritage has been a significant need for the whole of Europe. Current European trends have focused on **value-significant landscape properties** and the preservation of those characteristic landscape features that represent them and are the result of the natural and historical development.

In order to carry out the European Landscape Convention (ELC) implementation, the signatory countries bound themselves to **analyse their own landscape types** on their whole territory, analyse their characteristics, record their changes, specify the driving forces and pressures that form them,

and assess the selected types with regard to their specific values assigned to them by the involved parties and the public.

Goal of the **landscape typology of Slovakia** under the ELC is to identify mutual relations between the natural, cultural, historic, and socio-economic conditions, and to strengthen conservation of biodiversity of Slovakian landscape types.

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.

In order to **preserve landscape values,** it is necessary to provide complex and regular **landscape conservation.** In this respect, there exists a need to revise Act No. 543/2002 Coll. on nature and landscape protection.

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**. By signing the European Landscape Convention, the member states instituted a tool that focuses on securing a sustainable development based on balanced and harmonic relationships between social partners, economic activities, and the environment.

Slovak Ministry of Environment is the competent authority to coordinate, ensure compliance with obligations, and coordinate cooperation with other affected resorts within the ELC implementation in Slovakia. **Slovak Environment Agency is the executive body** of the Slovak Ministry of Environment within the process of the Convention's implementation.

Assessment of implementation of the European Landscape Convention in 2012

Slovakia took part in the award-winning process of the **Award of the Slovak Republic for Landscape** first time in 2010 as a signatory of the ECL. **In 2012, the second annual** award giving ceremony of the Award took place, nominating projects submitted by four subjects. The **award winner** was **Čiernohorská železnica n.o.** */Čiernohorská railway, non-government organisation/* with the project: **Rescue, renovation and operation of Čiernohorská railway in Čierny Balog.** By giving this award, the professional evaluation committee hailed the return of the people back to the landscape through the restoration of technical infrastructure within the landscape, giving back the identity to the region of Čierny Balog, and preserving its cultural heritage. The award-winning project was subsequently nominated by the permanent representation of the Slovak Republic to the Council of Europe for the Council of Europe Award for Landscape in 2013.

Framework Convention on the Protection and Sustainable Development of the Carpathians

Framework Convention on the Protection and Sustainable Use of the Carpathians (so-called **Carpathian Convention**) was adopted and signed by seven central-European and eastern-European countries (Czech Republic, Hungary, Poland, Romania, Serbia, Montenegro, Slovakia, and Ukraine) in May of 2003 in Kiev and became effective in 2006. **The Convention´s objective** is to secure cooperation between individual parties to the convention, as well as a comprehensive approach to sustainable development of the Carpathians.

In 2012, Slovakia took part in the **implementation** of adopted **protocols** under the Carpathian Convention through the implementation committee to the Convention as well as trough individual working groups - mainly the Working Group for the protection of sustainable development of biological and landscape diversity, Working Group on adaptation to climate change, Working Group on sustainable forest management, and Working Group on sustainable industry, energy, transport, and infrastructure.

Slovakia registered within the Carpathian Network of Protected Areas **21 "large-size" protected areas** (9 national parks, 12 protected landscape areas) and other more than 40 protected areas above 100 ha. A number of protected areas organized events to commemorate the Day of Carpathian Parks. Slovakia is also the coordinator of the Carpathian Wetlands Initiative (CWI)

Monument fund

In 2012, there was again a slight increase in total number of immovable (and movable) cultural monuments, compared to 2011.

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

Categorization of immovable NCM*	1993	2000	2005	2010	2011	2012
Architectural monuments	6 999	7 515	7 738	8 408	8 927	9 073
Archaeological monuments	344	340	360	407	408	464
Historical monuments	1 478	1 397	1 386	1 399	1 164	1 214
Historical gardens and parks	320	333	340	382	409	444
Folk architecture monuments	1 508	1 821	1 833	2 099	2 197	2 199
Technical monuments	423	451	454	520	593	601
Art work monuments	660	818	1 005	1603	1 379	1 393
Total	**11 732**	**12 675**	**13 116**	**14 818**	**15 077**	**15 388**

Source: MB SR

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

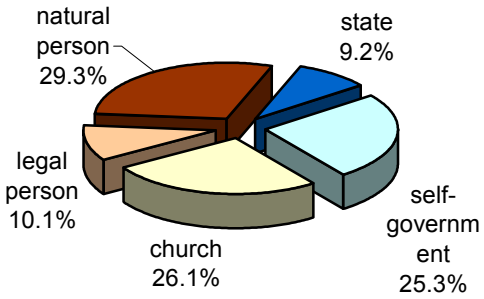
To 31st December 2012, there were **9 808 immovable national cultural monuments** in Slovakia consisting of **15 388 monument buildings** and **14 782 movable national cultural monuments** (98% of it has sacral character), which consist of **33 165** cultural articles.

Literary sources point to the past existence of 300 **castles** in Slovakia. Presently, the 9 808 immovable national culture monuments include 100 **castles** and 437 **mansions**. **Monument objects** within the NCM in 2012 register:

- 569 mansions and family households
- 100 castles
- 66 monasteries
- 1 592 churches
- 930 people's government houses
- 2 379 manor houses
- 235 palaces and villas
- 34 road sculptures and crosses
- 483 commemorative wall tablets and commemorative sites
- 66 cemeteries (with the exception of church graveyards)
- 45 graves (individual and mass)
- 49 vaults

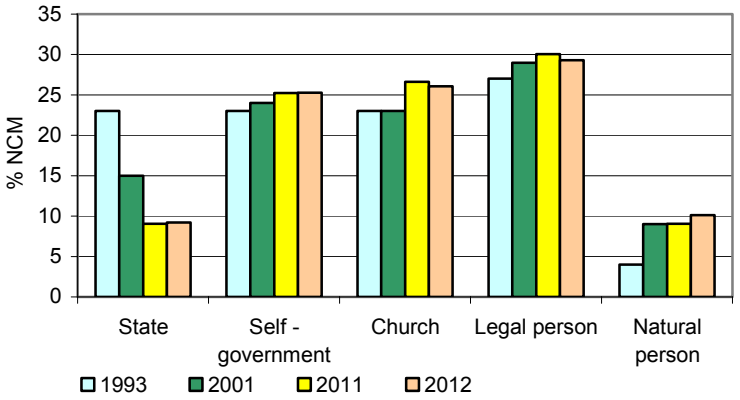
112 NCM were declared and 36 NCM were removed within the process of **legal protection** national cultural monuments in 2012.

Ownership form of immovable NCM in 2012



Source: MB SR

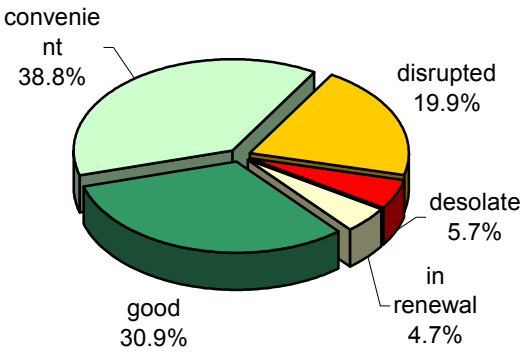
Trend in ownership form of immovable NCM



Source: MB SR

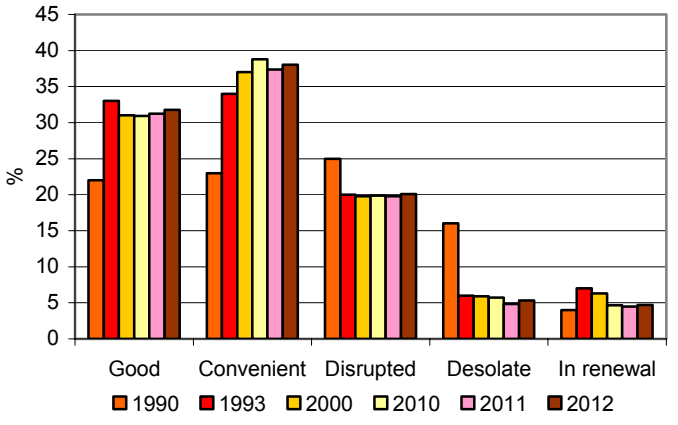
No major changes occurred in the trend of the monuments **ownership form**. This state has remained balanced for several years. No major differences were recorded between individual years. The only slight growth was recorded in the proportion of monuments owned by legal person.

Construction and technical state of immovable NCM in 2012 *(expressed in % of monument objects comprising the NCM)*



Source: MB SR

Trend in construction and technical state of immovable NCM



Source: MB SR

Note: Percentage share of construction and technical state of national cultural monuments is calculated from the total value of 15 029 monument objects that include national cultural monuments showing the construction and technical state in the interval of 1 to 5 (from "good" to "in renovation") The table does not include 359 monuments with the mentioned condition showing the value of: 6 (loss monument value due to renovation), 7 (renovation discontinued), 8 (AG - with not representation), 9 (physical extinction).

Number of monuments showing good to convenient state has grown only slightly, compared to the previous year. Nevertheless, due to the growing influence of climate changes, climate conditions, construction and other economic human activities, and deteriorating hydro-geological and hydrological conditions, the values of immovable property decline in monument areas. This has been witnessed by an increased number of NCM showing impaired **construction and technical state**. The mentioned causes also contributed to the increased number of buildings in a desolate state. Thanks to the additional system of the Ministry of Culture of the Slovak Republic under the programme "Let us renovate our house" the number of national monuments under reconstruction increased.

Besides the preservation of the historical monuments – the objects as solitaires, the monument fund **is also area preserved** in the monument areas: monument reserves (MR) and monument zones (MZ). No changes have been recorded compared to the previous year in this category of monuments as well as in the category of historical preserved parks - elements within MR and MZ (70 of these parks). Number of monument zones **grew** in 2012 from 84 (2011) to 86.

Town reserves

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

Source: MB SR

Folk architecture reserves

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

Source: MB SR

♦ Restoration of cultural monuments

In 2012, there was **5.5 mil. EUR** in contributions by the MoC SR to the restoration of national cultural monuments in the SR, which is **17.7%** more than in the previous year. The funds came from the **programme "Let us renovate our house",** within **547 projects**. 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"

	1993	2000	2005	2010	2011	2012
Number of projects	57	143	323	317	451	547
Total funding (€)	4 065 923	761 800	3 141 738	4 637 615	4 701 579	5 531 497

Source: MB SR

World Heritage

The efforts to create cultural and natural heritage were crowned by adopting the **Convention Concerning the Protection of World Culture and Natural Heritage** at the UNESCO general conference session in Paris in 1972 with Slovakia ratifying it on 15/11/1990.

♦ Sites enlisted under the World Heritage List

In 2012, no Slovak site was added on the World Heritage List.

Trend in total number of sites in World Heritage List

	2002	2005	2010	2011	2012
Number of enlisted sites	**730**	**811**	**921**	**936**	**962**
including cultural	563	630	714	725	745
natural	144	159	180	183	188
mixed	23	23	27	28	29
Number of Convention signatory countries	125	137	153	153	157

Source: MoC SR

World Heritage List as of 2012 contained **962 sites** from all around the world, which is an increase by 26 sites compared to 2011. Similarly, 4 new **member states** to the Convention were added.

In Slovakia, **seven sites** were put on the World Heritage List **as of 2012:**

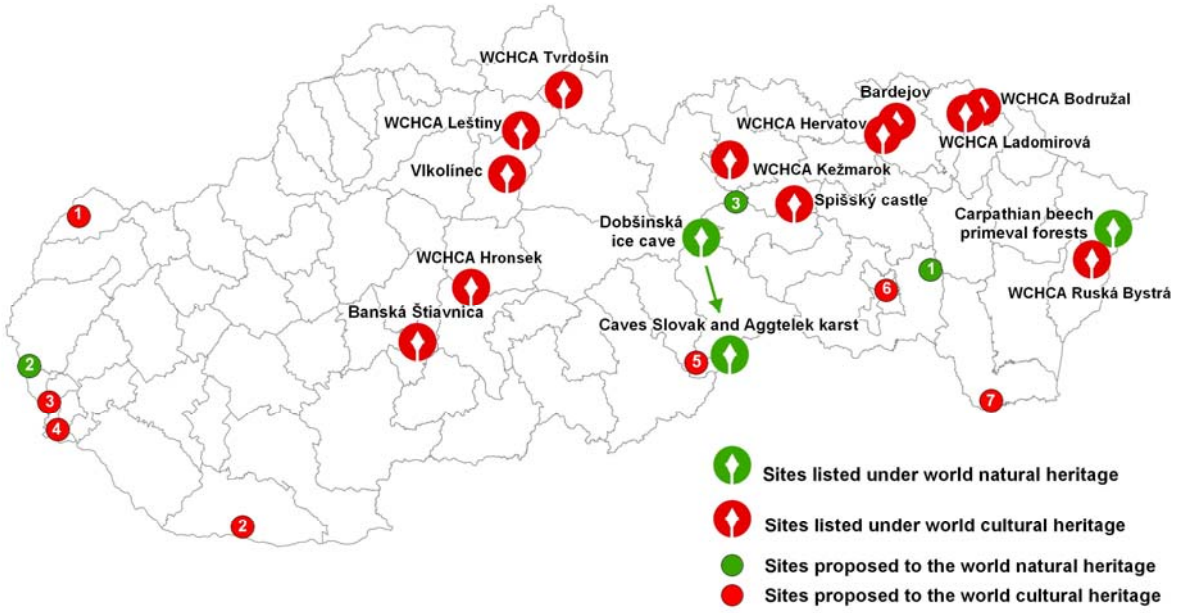
Under cultural heritage

- **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** (10 primeval forests; Christchurch, 2007) and **old beech forests of Germany** (5 primeval forests; enlargement in 2011), common site with Ukraine and Germany.

World culture and natural heritage in the SR



WCHCA – Wooden churches of the Slovak part of the Carpathian arch Source: SEA

♦ 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 2012 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

1. **Geyser in Herľany**
2. **Nature and cultural landscape in the sub-Danubian region** (anticipated common proposal with the Czech Republic, Austria and Hungary)
3. **Karst valleys of the West Carpathians** (together with Poland).

Comparison of the number of World Heritage (WH) sites with the surrounding countries to 2012

Country	Number of WH sites (cultural + natural)
Slovakia	5 + 2
Czech Republic	12 + 0
Poland	12 + 1
Hungary	7 + 1
Austria	9 + 0
Ukraine	4 + 1

Source: UNESCO

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 and No. 74036673/2012 to the Report on the Slovak Geoparks Strategy of October 31, 2012.

In 2012, there were **three** managed **territories of national geoparks**:

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

The most significant progress in territorial management was recorded in the Nógrád geopark that is the only geopark in Slovakia that belongs to the European Geoparks Network (EGN) and the Global Geoparks Networks (GGN) that operates under the patronage of UNESCO. **Activity of the expert group** started at the national level. The group comprises representatives from the existing geoparks, and professional and academic representatives involved in the revision of the Slovak Geoparks Strategy.

ENVIRONMENTAL REGIONALISATION

Key questions and key findings

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

- **In 2012, 13.5% of the Slovak environment was categorised as impacted or heavily impacted. Compared to 2007, this share has been reduced by approximately 2%.**

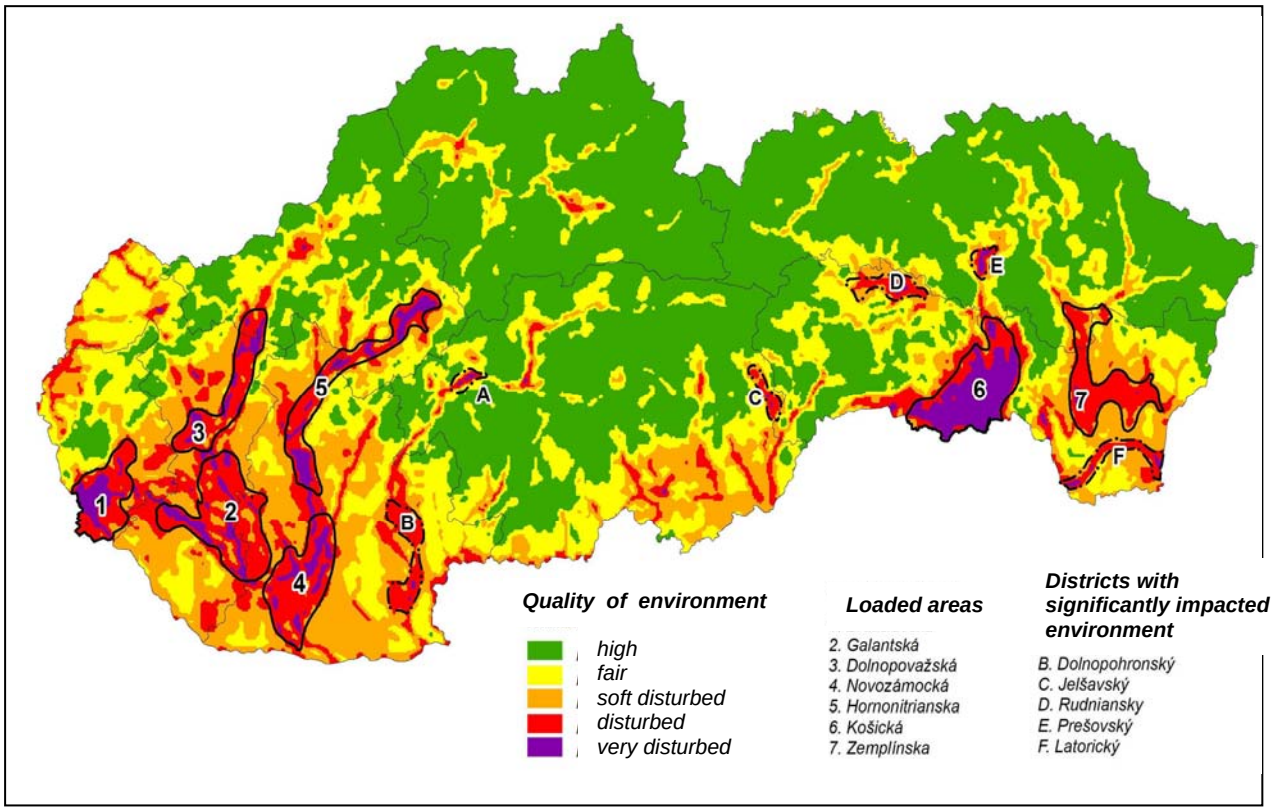
Environmental regionalisation and loaded areas

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

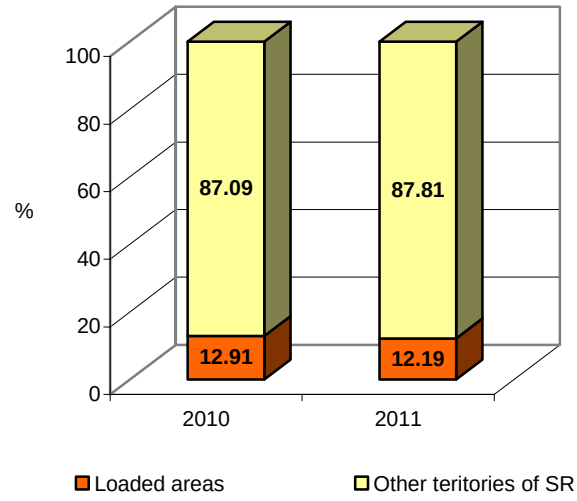
Quality of environment	Size (km^2) by 2007	% of the SR size by 2007	Size (km^2) in 2010	% of the SR size	Difference in size (km^2)	Difference %
1 – high quality environment	19 661	40.0	23 007	46.9	+ 3 346	+ 6.9
2 – sufficient environment	12 580	25.7	11 034	22.5	- 1 546	- 3.2
3 – slightly impacted environment	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

** revision of differentiation of the Slovak territory by environmental quality has been carried out every three years*

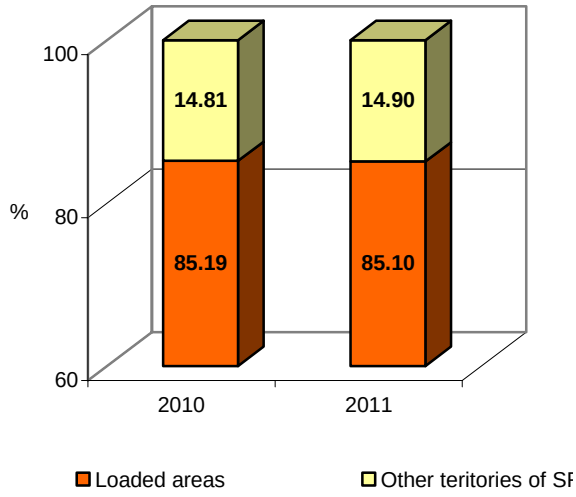
The following charts show that in the area of air pollution, water contamination, and waste generation that have significantly contributed to the state of environment in the territory; and most indicators show that the loaded areas bear 50% - 90% of load in Slovakia documented by individual indicators.

PM emissions from stationary sources in LA



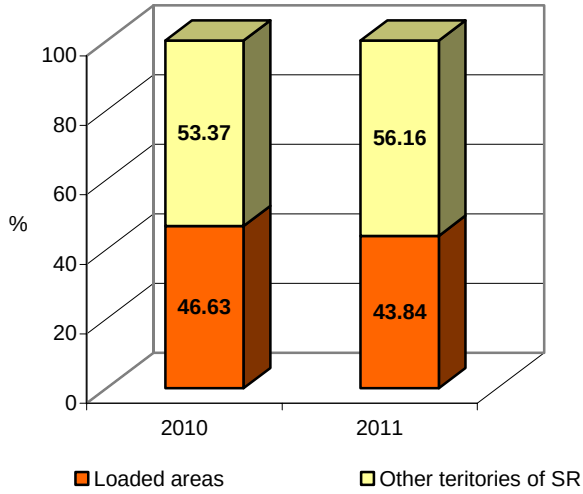
Source: SHMI

SO_2 emissions from stationary sources in LA



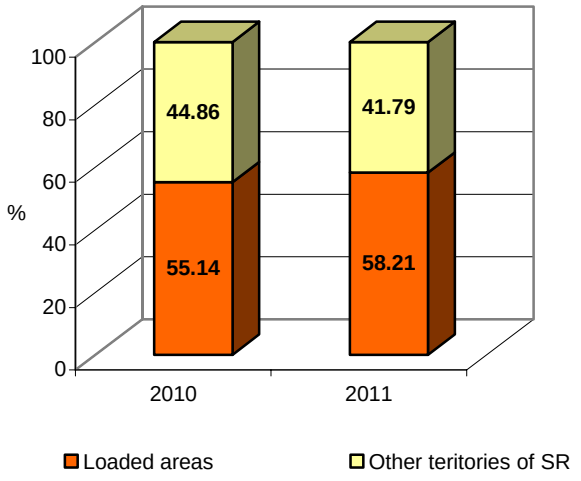
Source: SHMI

NO_X emissions from stationary sources in LA



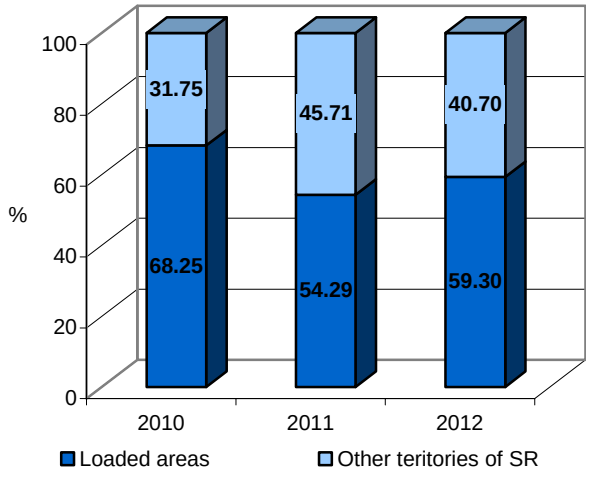
Source: SHMI

CO emissions from stationary sources in LA



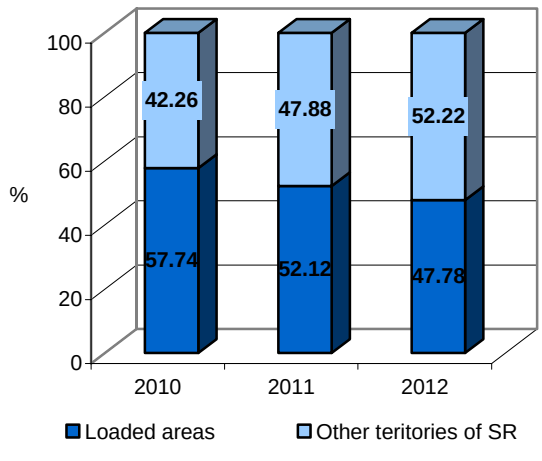
Source: SHMI

Discharged BOD_5 contamination in LA



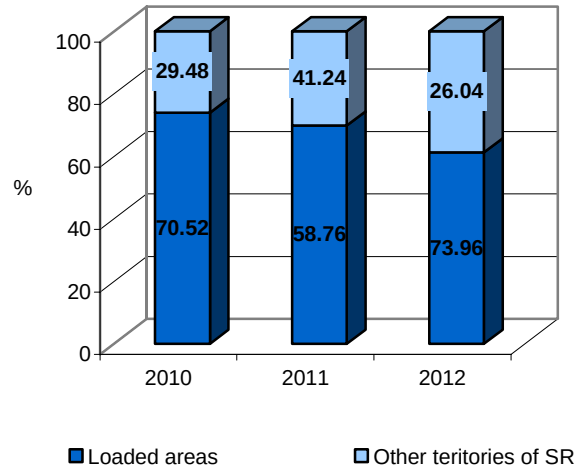
Source: SHMI

Discharged COD_{Cr} contamination in LA



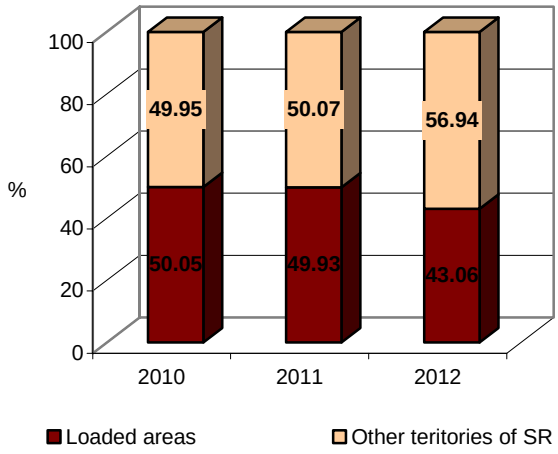
Source: SHMI

Discharged IS contamination in LA



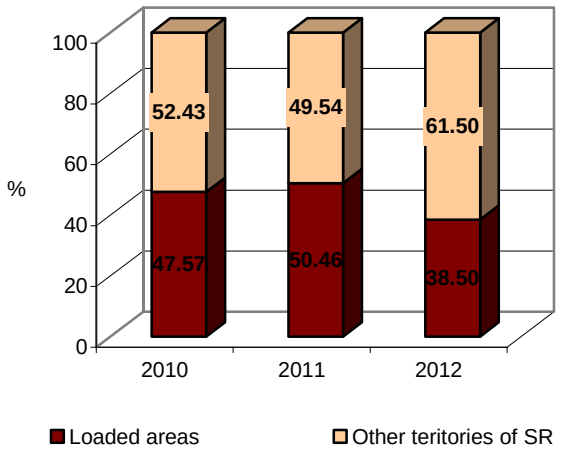
Source: SHMI

Other industrial waste generated in LA



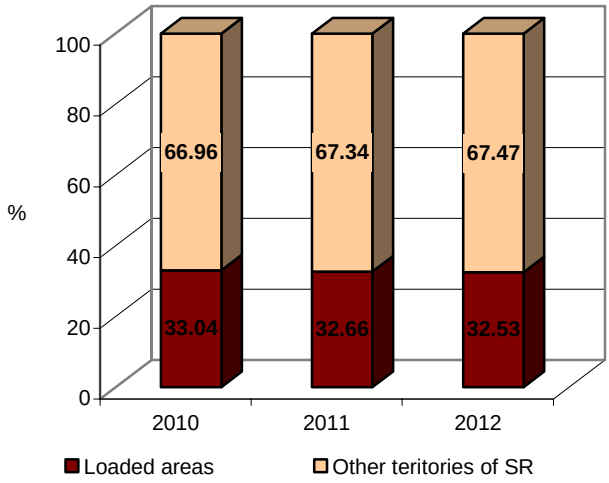
Source: SEA

Hazardous industrial waste generated in LA



Source: SO SR

Municipal waste generated in LA



Source: SEA

STATE OF THE ENVIRONMENT - CAUSES AND CONSEQUENCES

• ECONOMIC SECTORS AND THEIR IMPACT ON ENVIRONMENT

Key questions and key findings

What indicates the existing trend in the area of industrial production in terms of its impact on the environment?

- **Energy demand of the Slovak industry still remains very high. It reaches values that are far beyond the EU 27 and the neighbouring countries' average values. From the long-term perspective (2000-2012) there has been a decline in the impact of industry on the environment. Surface water abstraction by industry in 2012, compared to 2000, declined by 55% and represented 79.4% of all abstractions. When compared for the period of 2000-2012, abstraction of groundwater for the food industry declined by 20.1%, and by 32.2% for other industries. Discharged pollution by industrial wastewater was reduced. Slovakia, compared to the neighbouring countries, showed the greatest share of greenhouse gases emissions from industrial processes on total greenhouse gases emissions in 2011, but also the greatest proportion of industrial production on GDP among the EU countries. In 2011, CO emissions from the industry grew by 11.5% compared to the year 2000. SO_2 emissions declined by 39.5%, NO_X emissions declined by 46.8%, and particulate matter emissions declined by 81.3%. In 2012, volumes of industry-generated waste placed on the market declined, compared to 2000.**

What is the trend in the area of mineral extraction activities?

- **In the course of 2012, there was only a slight decline in brown coal and lignite extraction. From the perspective of a long-term trend (2000-2012), there were shown reduced volumes in the extraction of this commodity by 2007, with a growth in 2008 - 2009, and a new reduction in 2010. Extraction of ores grew in 2012 by 13.7 kt, compared to 2011. There has been a significant decrease in ore extraction activities over a longer time period (2000-2012). In 2012, ore extraction activities dropped by 94%, compared to 2000. Slight reduction in extracted volumes was recorded in magnesite and building stone. Slight growth was recorded in the volumes of ballasts and sands. Assessment of long-term trends (1993 - 2012) suggests that the majority of extracted raw material volumes in 2012 did not reach the level of 1993.**

Does the trend in energy intensity and energy consumption show positive characteristics in terms of its connection to the environment?

- **Energy intensity of the Slovak economy declined significantly as a consequence of the stabilizing the primary energy sources and the GDP growth. Since 1993 until 2011, the intensity has been reduced by more than a half. Period of the years 2000 and 2011 shows its reduction by more than 43%. When compared to 2010, intensity declined by approximately 5.7% between individual years. Despite this trend, the Slovak energy intensity is still way above the OECD member states´ average. Total final energy consumption has been fluctuating since 2001, with two lows recorded in 2004 and 2009. In 2011, final energy consumption declined by 6.8%, compared to the previous year. Greatest share in total energy in 2011 recorded industry (34.7%) followed by three sectors: households (23.8%), transport (23.7%), and trades and services (16.1%). Most growth of the consumption was recorded in area of transport that by 2011 had increased by approximately 34%, compared to 2001. In 1993, final energy consumption**

was approximately 28% higher than the present value (2011) with the sector of industry showing the greatest share of about 48%.

What is the trend of electricity production and what is the share of renewable energy sources?

- In 2012, total electricity production was 28 393 GWh. Compared 2011, it has grown only by 1%. In 2012, nuclear power plants had the highest share in production (54.6%), followed by thermal power plants (18.4%), and hydroelectric power plants (15.3%) The rest goes to other sources. Electricity production from renewable sources (RES) is slowly growing. Compared to 1993 and 2000 when the proportion of electricity produced from RES was at the level of 14.1% and 16.9%, in 2011 the proportion was 17.01%.

What is the trend in traffic indicators relevant to impacts on the environment?

- Modal split in passenger transport in the area of road transport in 2012 slightly declined, compared to 2011. Other types of transport showed a slight increase in passenger transport modal split. From the long-term perspective - comparison of the situation in 2000 and 2012, modal split in passenger transport grew only in air transport. However, it must be stated that in the years of 2005 - 2009, air transport showed a relatively significant increase in passenger transport modal split, while in 2010 there was a significant decline.
- Number of transported passengers by municipal public mass transport declined by 7% between individual years. From the long-term perspective - comparison of years 1993 and 2012 - number of transported passengers by municipal public mass transport declined by 26.2%.
- With growing individual passenger transport types and freight transport there is also a growth in the number of road motor vehicles. Since 1993, total number of motor vehicles has grown by 1 068 128 pieces (72.7%).
- Road network in 2012 comprised 18 017 km of roads and highways, which compared to 1993, represents an increased length by 152 km only. Most intensive growth in road construction was recorded after 2007.

What is the trend in indicators assessing the impact of transport on the environment?

- In terms of transport share in total emissions of assessed pollutants for 2011, significant was transport share in CO emissions – 25%, 49% in case of NO_X, and 10% in case of NM VOC. Transport contributed to particulate matter emissions with 7.6%, and to SO_2 emissions with 0.32%.
- In the sector of road transport, Slovakia is still not able to stabilise the growth of greenhouse gases emissions. Share of emissions within the sector of transport on total produced greenhouse gases emissions in 2011 was approximately 14%. (when expressed in CO_2 equivalents) While the share of emissions from stationary sources declines, share of emissions from transport still continues to grow. Since 1950, emissions from transport have grown by 27% and in 1990 reached only 9%.
- 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.
- Number of traffic accidents since 1993 continues to decline. Most noticeable has been the reduction since 2009 when a change to the methodology of traffic accident monitoring was implemented.

What is the impact of agriculture on the environment?

- Consumption of industrial fertilisers in agricultural production in 2012 represented 85.8 kg of net nutrients per ha of agricultural land, which is 6.2 kg more than in 2011. Between the years 2000 and 2012, consumption of industrial fertilisers was rising, with the exception of small deviations. This trend has continued since 1993 when 41.6 kg of net nutrients per ha of agricultural land was consumed.

- **Consumption of pesticides in 2012 recorded an increase compared to the previous year and reached the value of 3 925 tons. Since 1993, consumption of pesticides has been more-less balanced, with the exception of some years in which the consumption grew slightly.**
- **Between the years 2011-2012, abstraction of surface water for irrigation grew by 78.9%, abstraction of groundwater grew by 13.2%, and greenhouse gases emissions grew by 0.6%, with carbon dioxide representing more than a half of the produced volume of emissions. Production of ammonia emissions declined by 3.5% compared to the previous year. Volumes of waste from agricultural activities declined by 4.1%. From the long-term perspective (1993-2012); however, there has been a decline in the impact of agriculture on the environment. Over the mentioned period, abstraction of surface water for irrigation declined by approximately 78.6%. The only growth was recorded in 2000, reaching the highest level of surface water abstraction - 90.6 mil. m^3. Compared to 2004-2012 following a change in the methodology in 2003, abstraction of groundwater declined by 14.5%. Greenhouse gases emissions since 1993 have also shown a declining trend. In the period of 2000-2011 they remained roughly at the same level, with only slight fluctuations in individual years. Compared to 2000, greenhouse gases emissions declined by 10.8%, methane (CH_4) emissions declined by 23.9%, nitrogen monoxide (N_2O) emissions by 3.3%, and ammonia emissions (NH_3) by 25.2%. In 2012, compared to 2005, the number of waste generated in agriculture declined by 23.5%.**
- **In 2012, the size of agricultural land within the system of ecological agriculture reached 8.75% of total agricultural land size, which was a decline by 0.6% compared to 2011. In 2000-2004 this share was approximately only 2%. In 2005 it began to grow until 2011 when as much as 9.5% of agricultural land was classified into the system of ecological agriculture. From a long-term perspective (1993-2012), size of the land under this type of management has grown by 8.13%.**

Is forest management sustainable and environment-friendly?

- **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 (12.8% of non-identified forestland of total forestland size) has not been completed. Currently, the size of forest vegetation in Slovakia remain stable and takes up 41.1% of total national territory. In the long run it is possible to see its continuous growth - compared to the year 1981, by 24.1 thous. ha, and by 12.8 thous. compared to 2000. From year to year, the growth was 1 723 ha. The share of natural forest renewal (continuous growth from 8.6% in 1993 to 14.2% in 2000, and to the present 37.1% of total renewal. Annually, this share declined by 2.4%) has shown a positive trend, which helps promote sustainable management in forests. Gradual reduction in spatial distribution of coniferous trees (39.3%), especially spruce compared to broad-leaf trees (60.7%) has been a positive trend and helps the country to advance toward its target tree composition. Compared to 1993, share of coniferous trees declined by 3.8%. Compared to 2000, the decline was by 2.7%, and annually by 0.2%.**

What is the trend in the area of forest exploitation?

- **Although the health of forests has been stabilised over the recent years, it still cannot be considered positive. Gradual and long-term decline in the size of zones threatened by air pollution has been recorded. (from 25 400 ha in 2000 to the current 3 439 ha, with annual decline being 206 ha) The same trend exists in the volumes of calamity wood mass as the result of air pollution (decline by 124 tous. m^3 compared to 1993, and by 173 thous. m^3 compared to 2000. Annually, however, there has been a slight increase by 15 thous. m^3). In 1993, damage caused by wood-boring insects was 565.2 thous. m^3. Gradual increase of damage has been recorded since 2000 (324.4 thous. m^3) with climax in 2009. Since then, calamity caused by wood-boring insects has been declining. Annually, the scope of damage increased again by 27.5 thous. m^3, reaching the present 2 436.9 thous. m^3 of damaged wood matter. Due to adverse impacts by winds, 1 010.36 thous.m^3 of wood matter was damaged (79.4% of all abiotic agents),**

which is a decline by 726.5 thous. m^3 compared to the previous year, and an increase by 1 129.6 thous. m^3 compared to 2000. In the long run, however, there have been recorded irregular fluctuations in the damage by wind. As to the trees damaged by defoliation, compared to 2011, the share of trees in the defoliation categories of 2 - 4 (defoliation of trees between 26 – 100%) has grown by 3.2% in all the tree types. However, from the long-term perspective, this trend in forest damage can be looked at as fluctuations. The situation is still worse than the European average.

Industry

♦ Industry structure

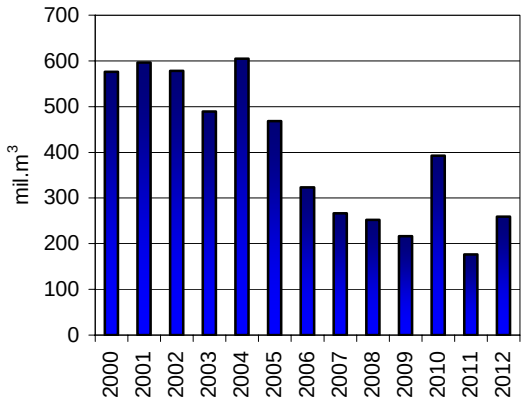
Industrial production includes four basic categories, based on the Revised classification of economic activities (SK NACE Rev. 2): **B** - Mining and quarrying, **C** - Manufacturing, **D** - Electricity, gas, steam and air-condition supply, **E** - Water supply, sewerage, waste management and remediation.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

♦ Demand of industrial production on the exploitation of resources

In 2001, industry contributed with 35.8% to the final energy consumption within the national economy. Share of the industry in the final energy consumption declined to 34.7% in 2011. In 2011, compared to 2001, there was a decline in the final energy consumption in industry by 14.7%. (within the whole national economy, decline in the final energy consumption was by 12.1%)

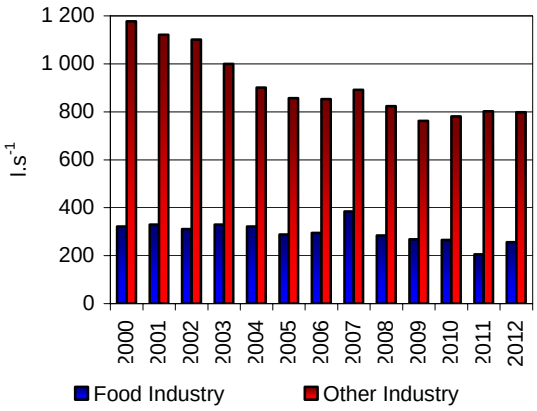
Surface water abstraction by industry in 2012, compared to 2011, declined by 46.8 % and represented 79.4% of all abstractions. Trend in **groundwater abstraction** by industry shows a decreasing tendency. In 2012, compared to 2000, there was a decline in groundwater abstraction in the food industry by 20.1%, and by 32.2% in other industries. Compared to the previous year, there was an increase in groundwater abstraction in the food industry by 24.4 %, and a decline by 0.5 % in other industries.

Development in consumption of surface water in industry (mil.m^3)



Sourcej: SHMI

Advancement in underground water consumption in industry (l.s^{-1})

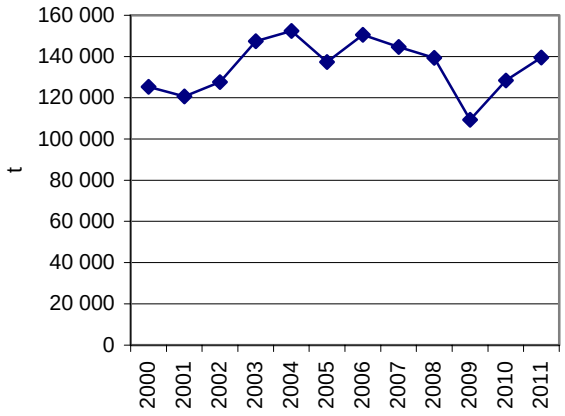


Source: SHMI

♦ Impact of industrial production on environment

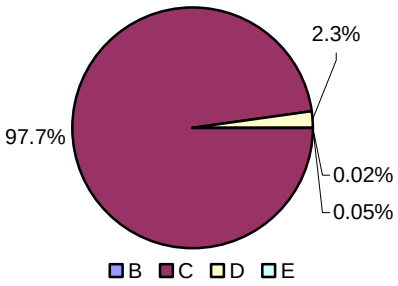
CO emissions from industry in 2011 made up as much as 98.8% of large-size and middle-size stationary sources, and emissions **increased** by 11.5%, compared to 2000. In 2011, the CO emissions from the industry in the previous year increased by 8.8%.

CO emissions trend from stationary industrial sources



Source: SHMI

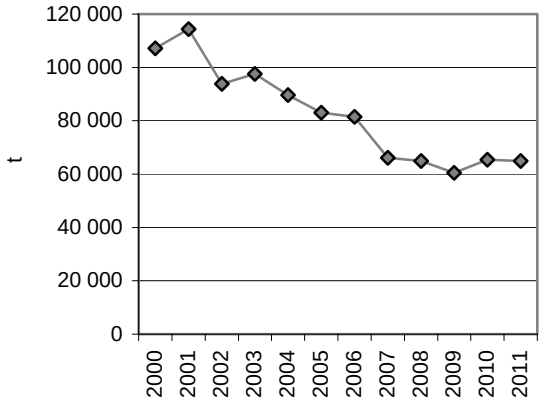
Share of CO emissions from stationary industrial sources on the overall CO emissions in 2011 (%)



Source: SHMI

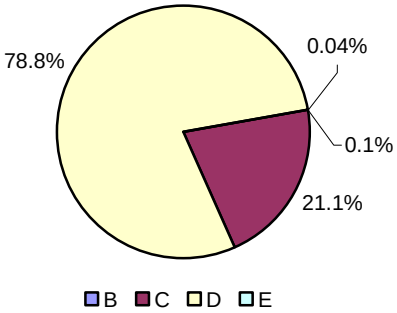
SO_2 emissions from industry in 2011 made up as much as 99.6% of large-size and middle-size stationary sources, and emissions **decreased** by 39.5%, compared to 2000. In 2011, SO_2 emissions from industry in the previous year decreased by 0.8%.

SO_2 emissions trend from stationary industrial sources (t)



Source: SHMI

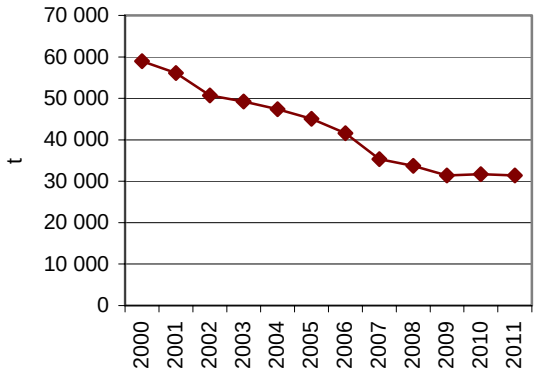
Share of the SO_2 emissions from stationary industrial sources on the overall SO_2 emissions in 2011 (%)



Source: SHMI

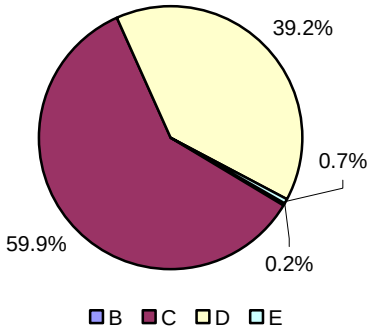
NO_X emissions from industry in 2011 made up as much as 89.9% of large-size and middle-size stationary sources, and emissions **decreased** by 46.8%, compared to 2000. In 2011, NO_X emissions from industry in the previous year decreased by 0.1%.

NO_X emissions trend from stationary industrial sources (t)



Source: SHMI

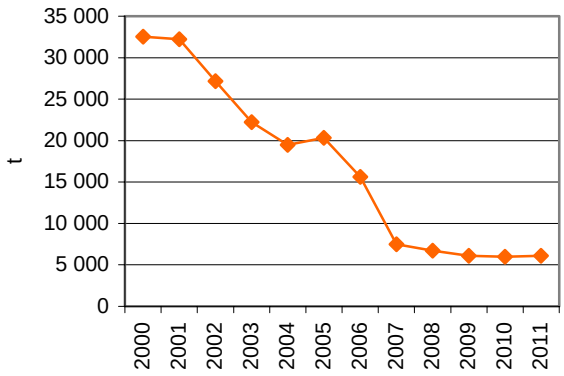
Share of the NO_X emissions from stationary industrial sources on the overall NO_X emissions in 2011 (%)



Source: SHMI

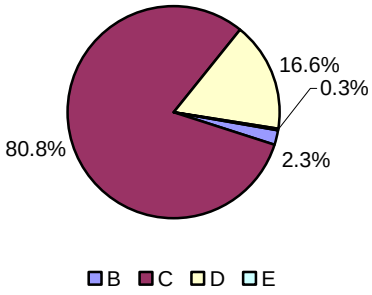
PM emissions from industry in 2011 made up as much as 93% of large-size and middle-size stationary sources, and emissions **decreased** by 81.3%, compared to 2000. In 2011, PM emissions from industry in the previous year increased by 2.1%

PM emission trend from stationary industrial sources (t)



Source: SHMI

Share of the PM emissions from stationary industrial sources on the overall PM emissions in 2011 (%)



Source: SHMI

Heavy metal emissions by industry have had a decreasing tendency since 2000. Nevertheless, in 2011, compared to previous year, there was an increase in the emissions of As, Cu, Pb and Zn from industrial incineration processes.

Aggregated greenhouse gases emissions from industrial processes showed a fluctuating trend. In 2011, when compared with 1990, greenhouse gases emissions from industrial processes dropped by 13.6%, and by 4.3% when compared with the previous year.

In 2011, **industry alone generated 4 671 843 tons of waste,** including **287 847 tons of hazardous waste** and **4 383 996 tons of other waste**.

Most common **losses of agricultural land** to industrial construction were recorded in 2009 (805 ha). In **forestland,** greatest losses to industrial construction were recorded in 2001 (18 ha). In 2012, losses of agricultural land to industrial construction accounted for 78 ha, while forestland lost 2 ha.

Extraction of minerals

♦ Trend in extraction of minerals

In 2012, there were in Slovakia registered 910 industrial mineral deposits of which 3 256.57 kt of industrial minerals were extracted (in 2011 the number was 3 495.02 kt), including 2 093.80 kt of brown coal and lignite (2 159.98 kt in 2011), 15.20 kt of crude oil and gasoline (18.11 kt in 2011), 1 162.77 kt of ores, magnesite, salt, and other minerals (1 335.06 kt in 2011), as well as 97 846 thous.m^3 of natural gas (97 929 thous.m^3 in 2011) . Surface extraction yielded 29 962.84 kt of minerals (34 951.12 kt in 2011), including 22 702.80 kt for construction (building stone, gravel sands and sands, brick clays – 24 701.92 kt in 2011), 7 135.10 kt of limestone (8 436.30 kt in 2011) and 1 799.60 kt of other minerals (1 812.90 kt in 2011).

This suggests that in 2012, compared to 2011, there was a continuing extraction of minerals, especially on the surface, and the increase has been only slight for some minerals. (ballasts and sands, brick raw material) Building stone showed the greatest reduction in extracted volumes (by more than 3 mil. t), followed by limestone and cement raw material. (by appr. 600 kt)

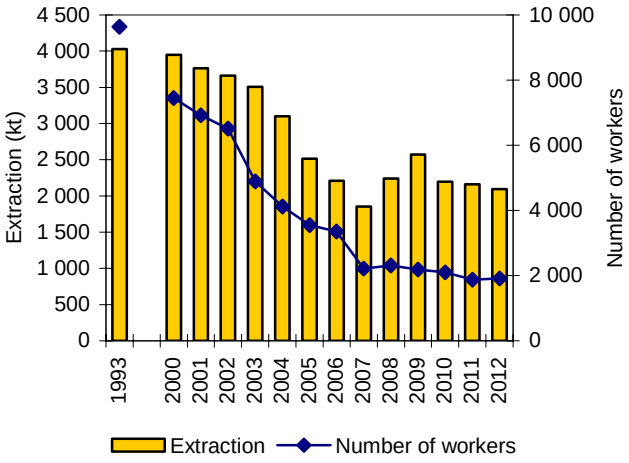
Trend in extraction of minerals

Extracted mineral	Measure unit	2006	2007	2008	2009	2010	2011	2012
Brown coal and lignite	kt	2 208.59	1 851. 56	2 242.82	2 573.71	2 196.45	2 159.98	2 093.80
Crude oil including gasoline	kt	30.5	24. 49	20.80	15.55	15.84	18.11	15.20
Natural gas	thous. m^3	136 881	500 550	111 823	106 668.00	109 493.15	97 929.00	97 846.00
Ores	kt	741.95	666.57	479.14	64.59	60.10	50.14	63.81
Magnesite	kt	1 467.80	1503.60	1 438.50	859.96	1 221.50	1 196.60	1 008.46
Salt	kt	122.50	116.76	99.31	41.40	0.02	0.02	0.00
Building stone	thous. m^3 (since 2009 kt)	6 309.20	6 528.40	7 789.11	17 552.60	17 165.30	15 373.39	12 076.80
Gravel sands and sands	thous. m^3 (since 2009 kt)	5 502.87	5 113.50	6 979.40	10 331.51	8 488.14	8 899.33	10 170.70
Brick clays	thous. m^3 (since 2009 kt)	508.00	1 011.70	512.74	523.50	351.30	429.20	455.30
Limestone and cement raw materials	thous. m^3 (since 2009 kt)	673.50	627.10	757.40	2 529.30	2 982.30	2 893.90	2 293.30
	kt	1 709,10	1 574.84	1 831.50				
Limestone for special purposes	thous. m^3 (since 2009 kt)	67.0	90.30	136.10	1 414.40	1 591.80	1 735.40	1 386.80
	kt	1 243.60	1 175.70	862.50				
High-content limestone	kt	4 393.00	4 362.00	4 035.80	3 714.83	3 700.70	3 807.00	3 455.00
Other minerals	thous. m^3 (surface)	436.60	476.73	490.71	-	-	-	-
	kt (under-ground)	115.30	139.40	140.60	132.46	87.70	88.30	90.50
	kt (surface)	856.40	880.60	931.80	1 655.30	1 752.40	1 812.90	1 799.60

Source: MMO SR

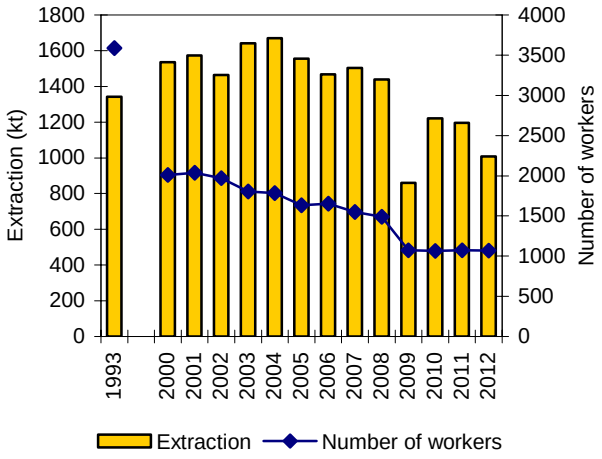
Basic indicators of mineral extraction trend in SR

Trend in brown coal and lignite extraction



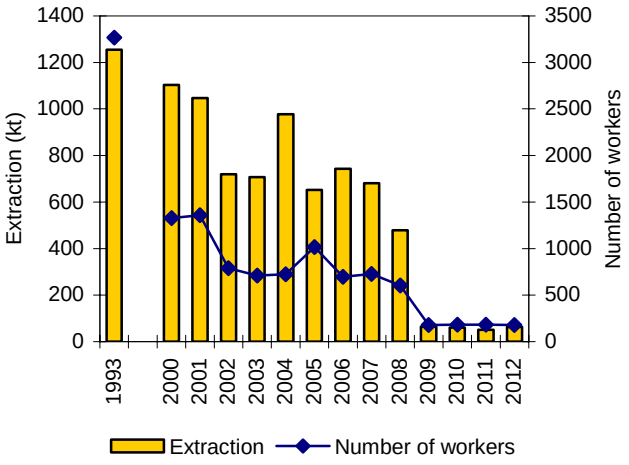
Source: MMO SR

Trend in magnesite extraction



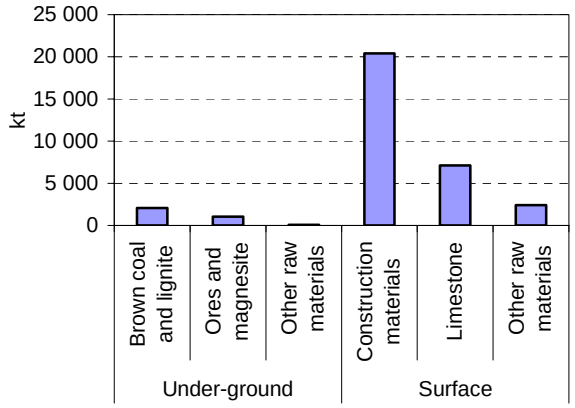
Source: MMO SR

Trend in ores extraction



Source: MMO SR

Total extraction of minerals in 2012



Source: MMO SR

♦ Environmental impact of mineral exploitation

As of December 31, 2012, local mining authorities monitored the total number of 127 dumps, 89 in extraction site (77 active and 12 inactive) and 38 inactive outside extraction site (36 active and 2 inactive). The territory with located dumps is 247.48 ha. There were monitored also 41 tailing dumps, 20 in extraction site (12 active and 8 inactive) and 21 outside in extraction sites (13 active and 8 inactive) **tailings dumps**. The territory with located tailing dumps is 181.95 ha.

Since 2009, provisions of **Act 514/2008 Coll. on handling of waste from extractive industry and amendments to selected laws** have been fully implemented. This Act regulates the rights and obligations of legal and natural persons - small businesses responsible for handling waste from extraction activities, including its temporary storage during the operation phase of the repository, roles of the national administration authorities in extractive industry waste handling, as well as liability for non-compliance with the legislation.

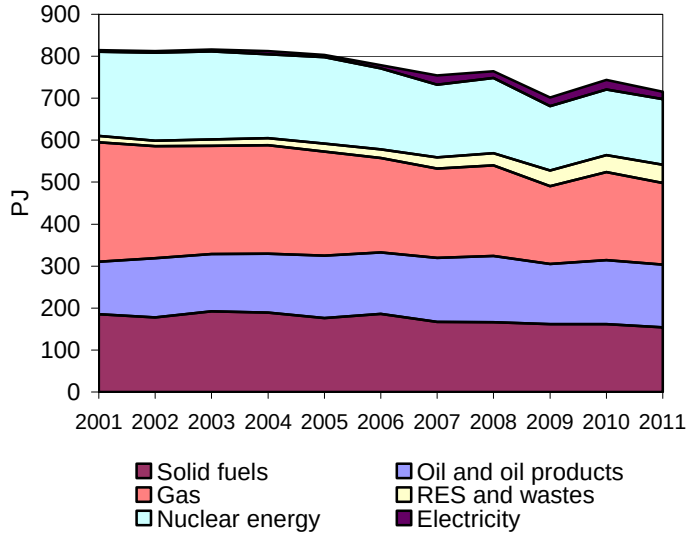
Power engineering, Heat production and Gas management

- **Energy sources balance**

Considering the natural conditions and the country´s current technological possibilities, Slovakia is poor on **primary energy sources** (PES). Almost 90% of PES is imported from the territories outside the internal EU market (Russia, Ukraine). Most significant domestic energy source is brown coal and lignite. Of all renewable energy sources (RES), biomass and water energy contribute the most to the primary production. Dependence of Slovakia on import in 2011 was 64.2%.

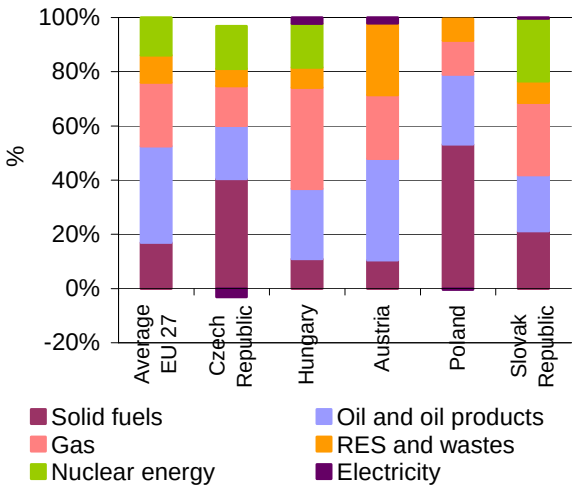
Structure of used PES in Slovakia in the years 2001-2011 was characteristic for a reduced consumption of solid and gas fuels, and heat. Also, electricity consumption was reduced. On the contrary, consumption of liquid fuels and renewable energy sources increased. Utilisation of nuclear fuels in recent years plays an exceptionally significant role in the PES structure of the Slovak Republic. **Gross inland energy consumption** in 2011 reach the level of 715.6 PJ, which is approximately 3.7% decline compared to 2010. This decline is a positive signal for meeting the energy strategy target - reducing the energy demand of the Slovak economy. Over the years 2001-2011, gross inland energy consumption declined by approx. 6.8%.

Trend in used primary energy sources in the SR



Source: SO SR

Structure of primary energy sources in 2011 – international comparison



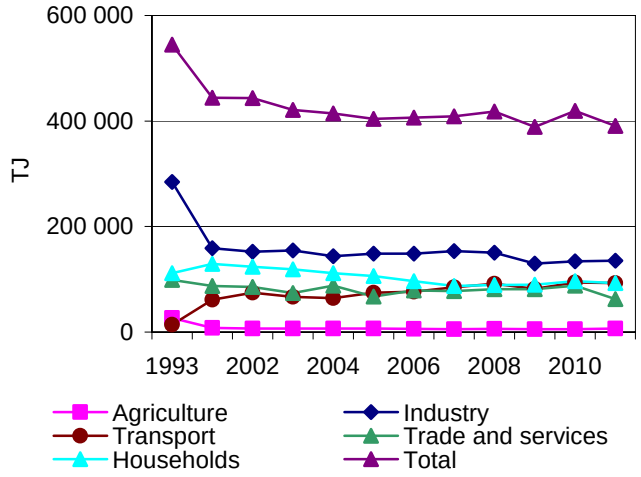
Source: Eurostat

Gross inland energy consumption per capita in Slovakia is still lower than the average consumption in the EU 27 and still remains below 95% of the EU average.

Final energy consumption by sectors was fluctuating and mostly declining in the period of 2001-2011**.** In 2011, final energy consumption declined compared to 2001 by approx. 12.1%. Compared to 2010, its annual decline was by 6.8%. Greatest share in total energy consumption in 2011 was recorded by industry (34.7%) followed by three sectors: households (23.8%), transport (23.7%), and trades and services (16.1%). The lowest share, only 1.7%, was recorded in agriculture. Rising trend

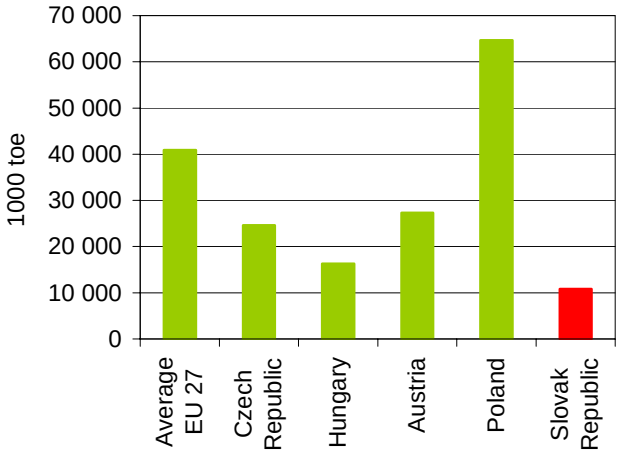
over the monitored period of 2001-2011 was shown in the sector of transport (increase by 50.9%). Consumption in other sectors since 2001 has been declining, despite slight fluctuations. Compared to other EU countries, there is a relatively low consumption by inhabitants.

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



Source: SO SR

Final energy consumption in 2011 – international comparison

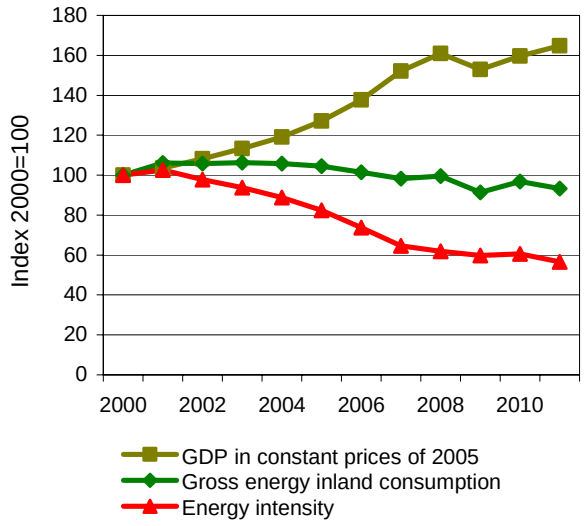


Source: Eurostat

- **Energy intensity**

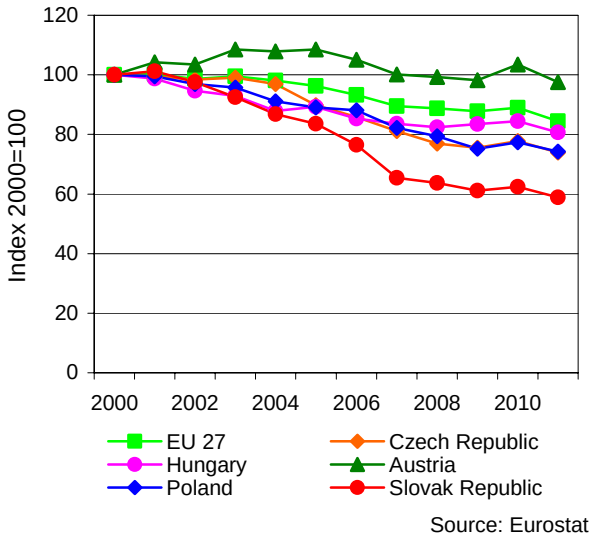
Energy intensity (EI) is an important economic indicator also used to make international comparisons. It is defined as the share of the gross inland energy consumption (GIEC) on the generated GDP (GEIC/GDP=EI). Since 2000, **energy intensity** has been declining every year. By 2011, it dropped by more than 43%. Despite this decline, Slovakia showed the highest energy demand among the EU 27 in the years 2005-2010. In 2011, energy demand in Slovakia was approximately 1.5 times higher than the EU 27 average.

Trend in energy intensity, GIEC and GDP in SR



Source: SO SR

Energy intensity in 2011 – international comparison



Source: Eurostat

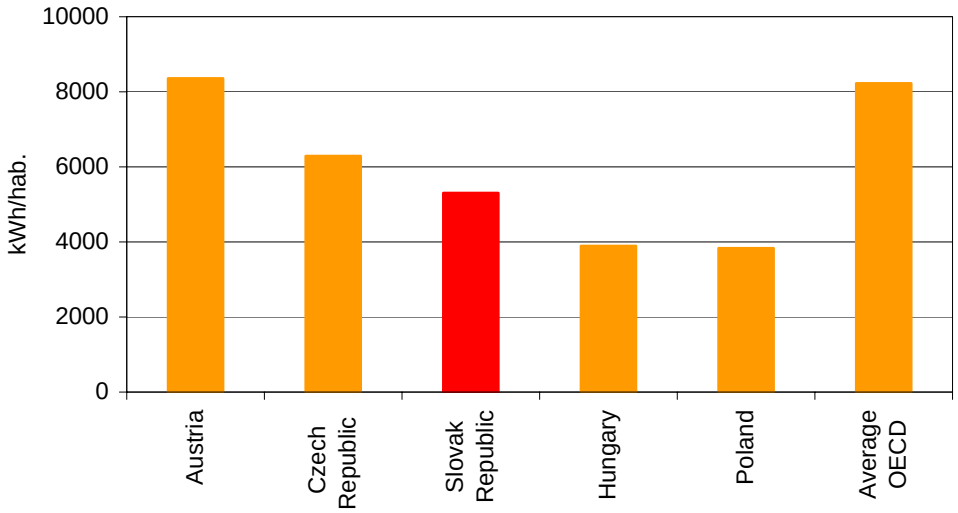
- **Electricity power management**

In 2012, **total electricity consumption** in Slovakia reached the volume of 28 786 GWh. Compared to 2011, it declined by 76 GWh. Decline of electricity was thus by 0,26 %. Historical trend in electricity consumption in the years 2010 to 2012 can be seen as stagnating. Annual maximum load reached the value of 4 395 MW (annual growth by 116 MW).

The highest growth in consumption has been recorded in the area of **trades and services**, with the second highest share in the final electricity consumption among all sectors (approx. 33%). Industry shows the highest electricity consumption, with more than a 45% share.

Compared to the developed OECD countries, Slovakia shows **electricity consumption** per capita lower by approximately one third.

Electricity consumption per capita in 2011 - international comparison



Source: IEA

Volume of **produced electricity** in 2012 was 28 393 GWh. Compared to 2011, electricity production grew by 258 GWh, which represents a 1.0% growth in production. In the long run, nuclear power plants have the most dominant share in electricity production in Slovakia, with 54.6% in 2012. In 2011, they were followed by fossil thermal power plants (18.4%), hydroelectric power plants (15.3%), and so-called other power plants showed the share of 11.7%.

- **Gas management**

Natural gas consumption in Slovakia reached the level of 5.2 bil.m^3 in 2012. Import takes up about 98% of domestic consumption.

In 2009, the market with gas practically opened, and a number of companies launched their activities in the area natural gas supplies to industrial consumers. Since 2011, companies began to supply natural gas also to households.

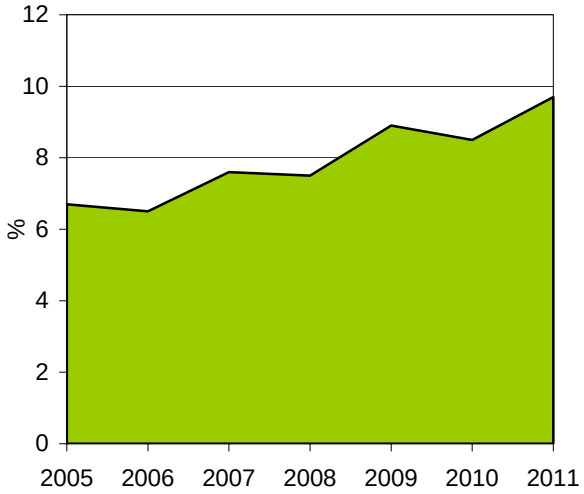
- **Renewable energy sources (RES)**

Slovakia adopted a national target to increase the share of renewable energy sources in gross final energy consumption by 2020 to 14% compared to 2005 when the share was 6.7%.

Over the years 2006 to 2011, share of energy produced from renewable energy sources grew by more than 49%. In 2011, share of the energy produced this way reached the value of **9.7%.** Despite the growing trend, Slovakia is still below the EU 27 average where the share of energy from RES in 2011 was 13%. Of all this mix, biomass use for energy showed the greatest share (almost 70%).

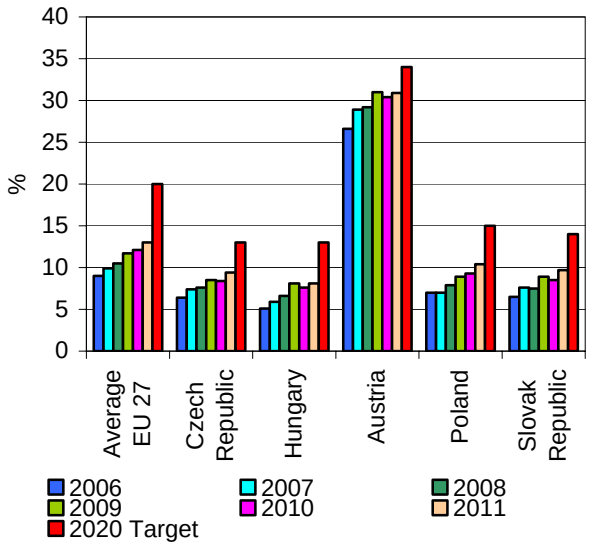
In 2011, 17.01% of the produced energy came from renewable energy sources. Compared to 2000 when the share of electricity produced this way was 16.9%, this is only a negligible increase. Hydroelectric power plants have the greatest share (more than 90%) in electricity production from among all the RES. For this reason, the volumes of electricity produced from RES in Slovakia is fully dependent on favorable hydrological conditions.

Trend in share of renewable energy in gross final energy consumption



Source: Eurostat

Share of renewable energy in 2011 – international comparison



Source: Eurostat

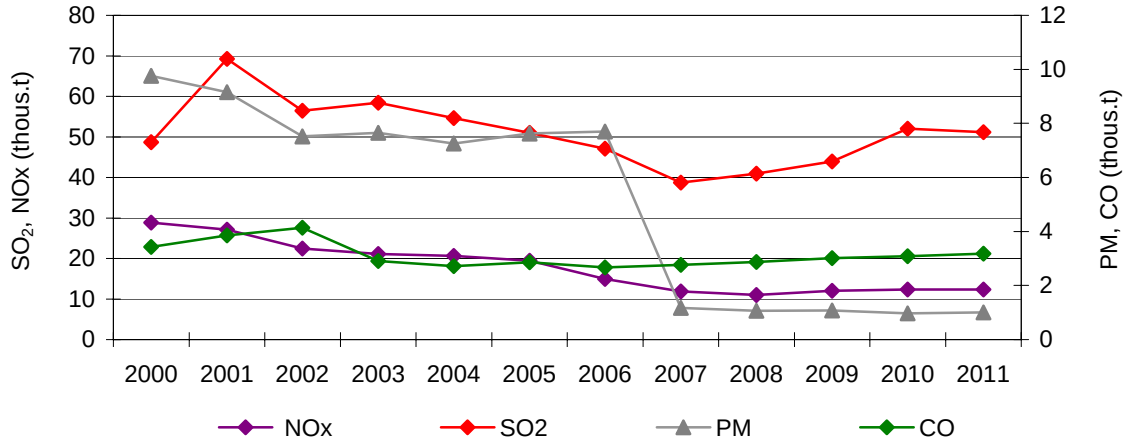
- **Impact of power engineering, heat and gas management on the environment**

Power industry shows the greatest share by **greenhouse gases emissions** that in 2011 (including transport with the share of 20.2%) represented 70% (31 533.37 Gg of CO_2) of total greenhouse gases emissions in Slovakia. By 2011, greenhouse gases emissions from power industry declined by 41.47%, compared to 1990. This was caused by an increased share of services in GDP creation, as well as by a higher share of natural gas within the fuel base, and by structural changes and declining energy consumption by energy intensive sectors.

Energy production and consumption is accompanied by the **production of basic pollutants**. Until 2007, sulfur oxides (SO_2), nitrogen (NO_X), and particulate matter (PM) emissions were reduced significantly. This situation was caused by decreased production and consumption of energy and a shift in the fuel base toward more purified fuels, as well as by using fuels with better quality characteristics.

SO_2 emissions grew in the period of 2007 to 2010. In 2011, these emissions declined slightly but still remained 5% higher than in 2000. Similarly, CO emissions began to rise (compared to 2007 they grew by 15%) along with nitrogen oxides emissions that grew slightly. PM emissions grew by approx. 4% compared to 2010 and their trend since 2007 has remained balanced.

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

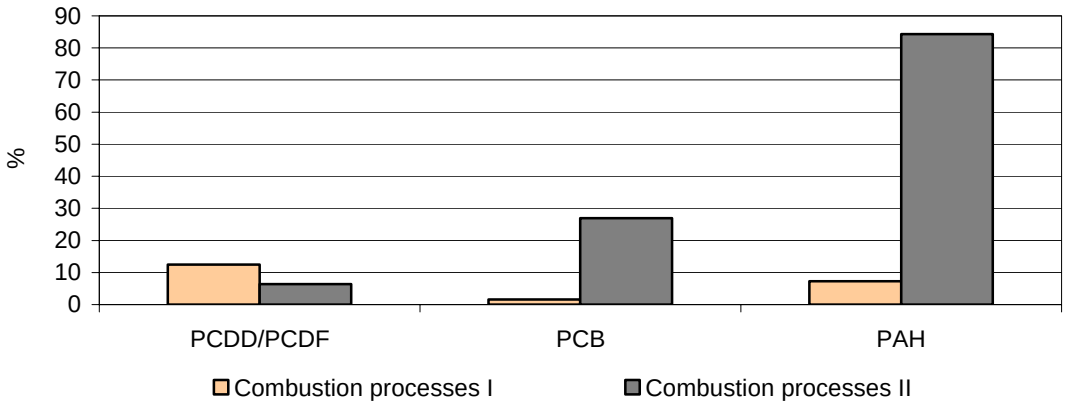


Source: SHMI

Persistent organic pollutants (POPs) and **heavy metal emissions** within the power industry sector also include combustion processes I (systematic power industry, municipal power industry) and combustion processes II (heating of commerce and services, heating of households).

Declining trend in POP emissions was most clearly seen in the 90-ties as a result of changes to aluminum production technologies. In 2011, emissions from combustion processes I declined by approx. 23.4%, compared to 2010. On the contrary, emissions from combustion processes II annually grew by approx. 9%.

Share of POPs emission from sector of energy to overall POPs emission in the SR in 2011



Source: SHMI

In **heavy metal emissions** from combution processes I, the year 2011 with declining emissions of the elements Ni and Se still showed a negative trend in the other heavy metals with the highest increase in As (increase by approximately 15.9%), Pb (increase by 11.7%), Cd (increase by 11.7%), and Hg (increase by 11.3%). As for combustion processes II, emissions declined in As, Cr, Ni, Sn and Mn. Negative trend was recorded in Pb, Cd, Hg, Zn, Se and Cu. In 2011, from among all power industry heavy metals, Mn with 18.6% showed the greatest share in total heavy metals emissions.

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 2011, volume of discharged water from the production and distribution of electricity grew from 19 430 thous.m^3 to 93 804 thous.m^3 in 2012. Compared to 2011, volumes of discharged water from the heating industry grew by approx. 19.4%.

Waste water discharged by energy production in 2012 (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	11 316.524	114.602	31.426	186.285	0.705
Untreated	80 091.728	30.243	6.475	31.919	0.001
Subtotal	**91 408.252**	**144.845**	**37.901**	**218.04**	**0.706**
Waste water from heat production					
Treated	999.803	10.047	1.350	34.113	0.139
Untreated	1 395.997	7.729	0.000*	5.961	0.003
Subtotal	**2 395.800**	**17.776**	**1.350**	**40.074**	**0.142**

Source: SHMI

In 2012, the sector of energy and gas industries generated 1 045 757.25 tons of **waste introduced to the market,** which represents an increase in production by 10.6%, compared to 2011. Hazardous waste represented only 0.44% (4 603.30 t), while other waste represented 99.56% (1 041 153.96 t). Classification of economic activities shows that this section of economic activities contributed with a 15.1% share to total waste production in 2012.

Transport

♦ Passenger and freight transport

In 2012, **passenger transport** by the public road and railway transportation showed long-term reduction trend 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. Number of carried passengers along with passenger modal split in air transport recorded a slight increase compared to the previous year. In terms of assessing individual transport types by passenger transport modal split in 2012, individual motor vehicles represented 75%, public road transport showed 13%, railway transport recorded 7%, municipal mass transport 3%, and air transport 2%.

Freight transport and **transport performances** in all freight transport types with the exception of air transport in 2012 remained roughly at the level of the year before. Although there was a slight decline in road freight transport, transport performances recorded a minimum growth compared to 2011. Air freight transport grew to 4 thous. tons. Road transport contributed the most to freight transport outputs (by 76%), followed by railway transport (21%).

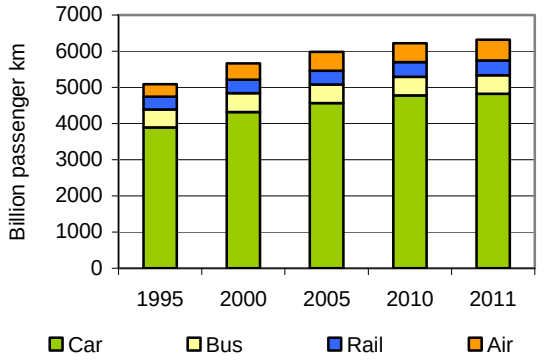
Trends in passenger and freight transport

Indicator	1993	2000	2001	2003	2005	2007	2008	2009	2010	2011	2012
Road transport											
Transport of passenger (thous.)	825 677	604 249	564 078	493 706	449 456	384 637	365 519	323 142	312 717	299 579	289 228
Performances (mill. pass-km)	11 445	8 435	8 051	7 757	7 525	7 596	6 446	4 538	4 436	4 611	4 584
Transport of goods (thous. tons)	37 826	39 680	187 624	174 149	195 405	179 296	199 218	163 148	143 071	132 568	132 074
Performances (mill. tkm)	5 464	7 212	13 799	16 859	22 550	27 050	29 094	27 484	27 411	29 045	29 504
Rail transport											
Transport of passenger (thous.)	86 727	66 806	63 474	51 274	50 458	47 070	48 744	46 667	46 583	47 531	44 698
Performances (mill. pass-km)	4 569	2 870	2 805	2 316	2 182	2 165	2 296	2 264	2 309	2 431	2 459
Transport of goods (thous. tons)	64 825	54 177	53 588	50 521	49 310	51 813	47 910	37 603	44 327	43 711	42 599
Performances (mill. tkm)	14 304	11 234	10 929	10 113	9 463	9 647	9 299	6 964	8 105	7 960	7 591
Water transport											
Transport of passenger (thous.)	134	80	82	321	134	122	122	110	120	111	120
Performances (mill. pass-km)	7	4	4	5	4	4	3	3	3	3	4
Transport of goods (thous. tons)	1 399	1 607	1 551	1 451	1 526	1 806	1 767	2 192	3 109	2 454	2 472
Performances (mill. tkm)	843	1 383	1 015	488	680	843	979	1 230	2 166	1 024	1 078
Air transport											
Transport of passenger (thous.)	34	146	187	428	1 716	3 068	4 176	2 288	554	603	669
Performances (mill. pass-km)	37	246	335	660	2 465	3 699	4 650	3 501	835	878	939
Transport of goods (thous. tons)	5,92	0	0	1	0	0	0	0	0	1	4
Performances (mill. tkm)	0,5	0	0	1	1	1	0	0	0	4	8

Source: SO SR

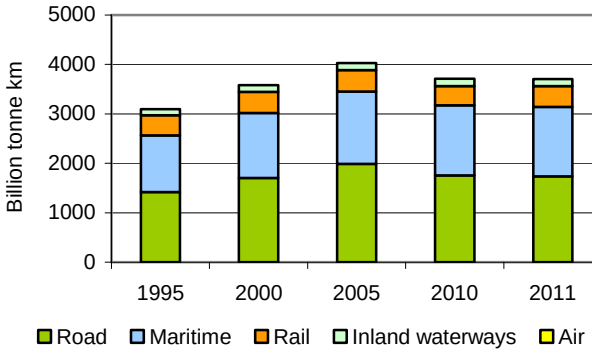
European Commission in 2011 published its third **White Paper: Roadmap to a Single European Transport Area** (hereinafter on Transport 2050) introduced the ambitious plan to increase mobility and reduce emissions. The set goals need to be reached by 2020/2030-2050 and address three modes of transport - transport over middle distances, long distances, and municipal transport. The goal for passenger transport is to reach, by 2050, a situation with the majority of passengers using the rail transport over middle distances. By 2030 it will be necessary to ensure that 30% of road freight transport over 300 km be supplied by other transport modes (e.g. railway transport or water transport), and by 2050 this share should be more than 50%.

Passenger transport volume and modal split within the EU (billion.pkm)



Source: EEA

Freight transport volume and modal split within the EU (billion.tkm)



Source: EEA

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. Buss transportation has over the monitored time period been the major player in passenger transport, followed by tram and trolley buss transportation.

Indicators of city transport

Indicator	1993	2000	2001	2003	2005	2007	2009	2010	2011	2012
Total number of transported passengers (thous.)	525 744	389 263	373 269	394 465	395 064	403 466	389 263	385 594	417 293	388 239
Trams										
Transported passengers (ths.)	188 768	100 871	98 719	104 560	109 101	109 705	100 871	97 739	109 082	98 788
Seat kilometres (mill. km)	2 734	1 793	1 866	1 764	1 822	1 792	1 793	1 782	1 789	1 735
Trolleybuses										
Transported passengers (ths.)	43 346	62 745	53 167	59 034	58 032	60 655	62 745	62 236	65 420	63 281
Seat kilometres (mill. km)	717	1 111	1 008	1 110	1 075	1 104	1 111	1 125	1 228	1 207
Buses										
Transported passengers (ths.)	293 629	225 647	221 383	230 871	227 931	233 106	225 647	225 619	242 791	226 170
Seat kilometres (mill. km)	4 998	3 980	3 996	3 899	3 846	3 839	3 980	4 202	4 028	3 988

Source: SO SR

♦ Number of vehlices

Rising trend in the number of motorised vehicles continued in 2012, by **more than 95 745 pieces** compared to 2011. All categories show an increase in the number of road motor vehicles in 2012. Major modernisation works were carried out in the area of public bus transport, including a continuing modernisation of fleet. This relates to stricter emissions limits (EURO) as well as to the need to make the public transporter more attractive to the passengers, i.e. increase its competitiveness with individual transport.

Number of transport vehicles in railroad and aquatic transport types (most environmental-friendly transport modes for passengers and goods) show declines by individual years.

Number of motor-vehicles by individual types (pcs)

Total number of vehicles	1993	2001	2003	2005	2007	2008	2009	2010	2011	2012
Passenger cars	994 933	1 292 843	1 356 185	1 303 704	1 433 926	1 544 888	1 589 044	1 669 065	1 749 271	1 824 190
Trucks and Pick up vans	101 552	120 399	142 140	160 089	196 141	227 218	246 667	252 866	256 869	259 839
Special vehicles	46 121	36 082	32 033	22 648	18 983	19 675	18 947	20 462	21 953	24 170
Road tractors	-	4 994	8 851	14 141	19 556	21 444	22 655	23 183	24 942	26 139
Buses	12 655	10 649	10 568	9 113	10 480	10 537	9 400	9 350	9 074	8 957
Tractors	65 150	63 422	61 690	46 544	44 098	45 387	45 769	46 092	46 846	47 645
Motorcycles (excl. small)	81 263	46 676	48 709	56 366	63 897	70 318	55 443	59 563	63 859	68 063
Trailers and Semi-trailers (included bus)	167 174	206 627	218 517	188 411	199 329	211 555	218 724	226 333	234 502	241 8223
Others	-	1 507	1 161	101	3 414	7 159	29 959	32 444	34 915	37 150
Total	**1 468 848**	**1 783 199**	**1 879 854**	**1 801 117**	**1 989 824**	**2 158 181**	**2 236 608**	**2 339 358**	**2 442 231**	**2 537 976**

Source: SO SR

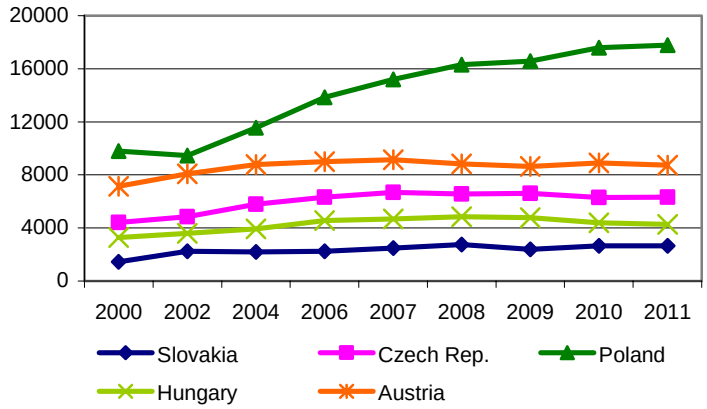
♦ Transport infrastructure

In 2012, the SR transport network included **18 017 km of roads and motorways**. Highways represented 419 km and length of local communication was 25 351 km of the network. The length of **railways** was **3 631 km**, with 1 586 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

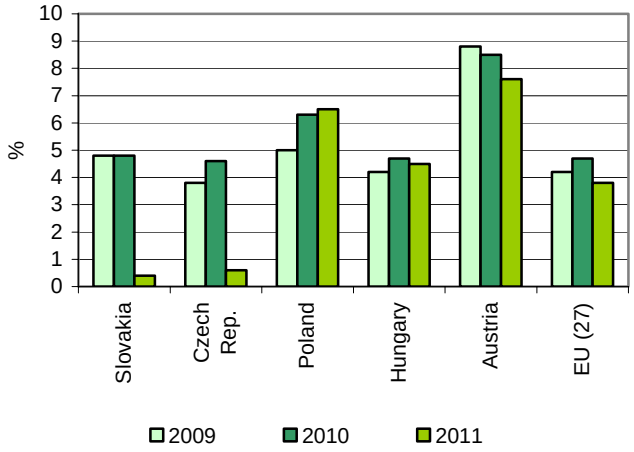
Final energy consumption in the transport sector over the period of 15 years has more than doubled itself. Overall consumption of liquid fuels (97 %) represents the greatest share of energy consumption in the transport sector on the overall energy consumption, while the share of solid fuels, gaseous fuels and electricity overall consumption remains small. Road transport shows the greatest share on the consumption of liquid fuels in the transport sector, on the contrary, proportion of the end electricity consumption in the sector of transport is by the railway transport.

Comparison of final energy consumption by transport in selected countries (1 000 toe)



Source: Eurostat

Share renewable energy in fuel consumption of transport (%)

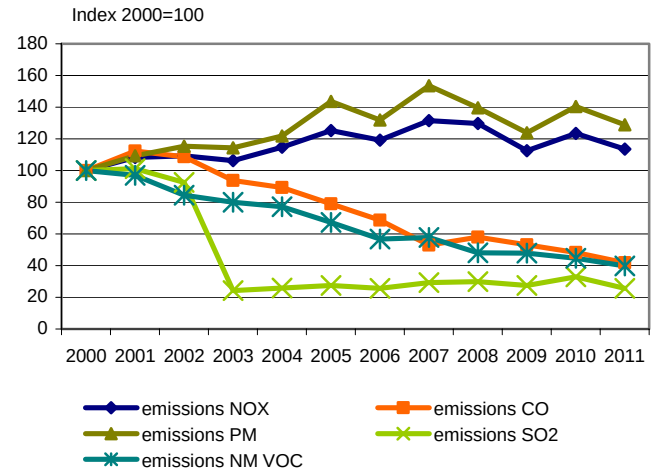


Source: Eurostat

♦ Impact of transport on environment

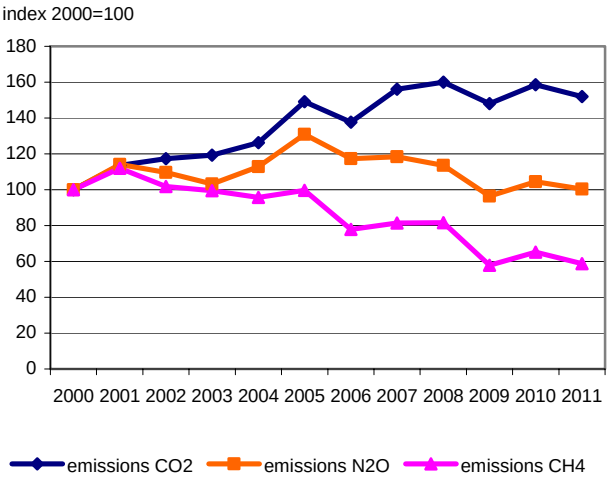
The CORINAIR methodology has been used to determine production volumes of individual monitored harmful substances in the EU countries. Its unique programme product called COPERT is designated to assess and evaluate the annual emission production from road transport. Basic pollutants emissions from transport in 2011 decline and have receved the level of 2009.

Trends in emissions of air pollutants from transport in SR



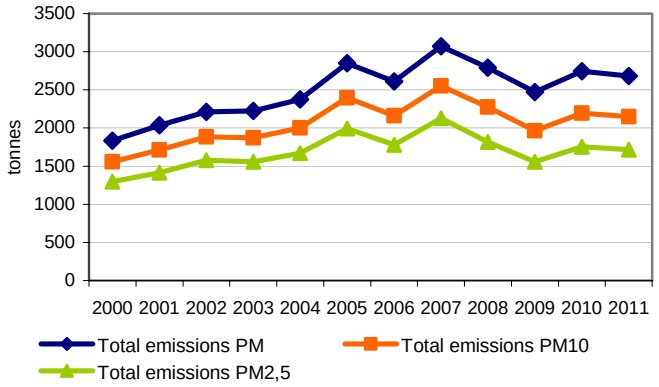
Source: SHMI

Trends in GHG emissions from transport in SR



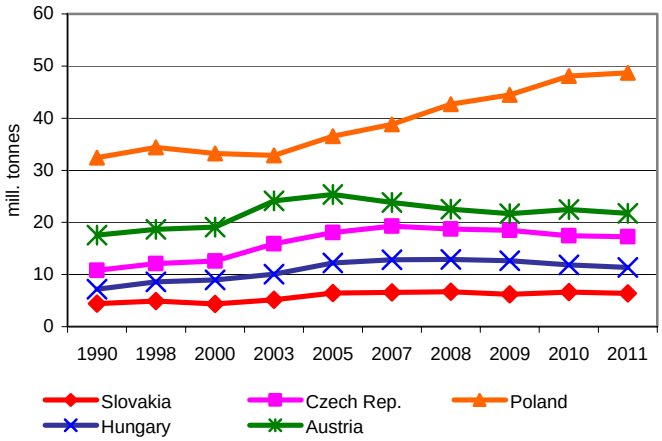
Source: SHMI

Total Particulate Matter emissions ($PM_{2,5}$ and PM_{10}) from road transport in period 2000 - 2011 (tonnes)



Source: SHMI

Total GHG emissions from transport in Europe (mill. tonnes)



Source: Eurostat

In terms of transport's share on total emissions of the assessed pollutants for 2011, significant is transport's share on CO emissions – 25%, 49% in case of NO_x and 10% in case of NM VOC. Solid pollutants represented 7.6% of all emissions in 2011, while the SO_2 emissions showed 0.32%. Transport's share on heavy metal emissions is approximately 7.6%, with copper showing the greatest share on heavy metal emissions by transport (18.1%) followed by zinc (7.9%), and lead (5.0%). 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 the sector of road transport, Slovakia has not been able to stabilise the rising trend in greenhouse gases emissions. Share of emissions within the sector of transport on total produced greenhouse gases emissions in 2011 was approximately 14% (when expressed in CO_2 equivalents). While the share of emissions from stationary sources declines, share of emissions from transport still continues to grow. Since 1990, emissions from transport have grown by 27 % and in 1990 reached only 9 %.

Within the area of transport and transport routes in 2012, 112 606 tonnes of **waste** were produced, of which 11 994 tonnes were hazardous waste, and 100 612 tonnes were other types of waste. This represents a decrease by 12 587 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.**

The mentioned Directive calls for an on-going periodic monitoring of road transport noise, noise from the railway transport and from industrial activities, and from large-size noise sources within the territory every 5 years.

The findings show that 84 700 of Slovak inhabitants have been exposed to road transport noise where the value of 60 dB is exceeded. 126 400 of Slovak inhabitants have been exposed to the noise above 60 dB that comes from the railway transport, while 500 inhabitants are exposed to an excessive

noise from the air transport. 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

"Strategy for increasing the road traffic safety in the Slovak Republic for the years 2011 to 2020" has been the strategic document approved in 2011. With its activities and measures, the Strategy aims to minimise the losses of human lives and material damages. Its target is to reduce the number of fatal traffic accidents by 2030 by 50%, compared to 2010.

In 2012, 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 2011.

Trend of traffic accidents in SR

Indicators		1993	2000	2002	2004	2006	2007	2008	2009*	2010*	2011*	2012*
Traffic accidents	Number of accidents	50 159	50 930	57 060	61 233	62 040	61 071	59 008	25 989	21 611	15 001	13 945
	Killed	584	626	610	603	579	627	558	347	345	324	296
	Heavily injured	2736	2 205	2 213	2 157	2 032	2 036	1 806	1 408	1 207	1 168	1 122
	Lightly injured	8 682	7 891	8 050	9 033	8 660	9 274	9 234	7 126	6 943	5 889	5 316

*since 2009 methodology changed

Source: ŠO SR

Agriculture

♦ Structure of agricultural land

In 2012, **total area of agricultural land in Slovakia was 2 405 971 ha.** Analysis of the changes to overall values of land types for the year 2012 as compared to 2011 suggests that the **loss** of agricultural land in 2012 (-4 841 ha) when compared with 2011 (-3 479 ha) is higher by 1 362 ha. Trend in the soils of Slovakia in 2012 has been affected by further **loss of** agricultural land types and arable land types**,** giving way to forestland, non-agricultural, and non-forested land types.

Structure of the agricultural land (state to the date 31st December 2012)

Type of land	Area(ha)	Share of agricultural land (%)
Agricultural land total	2 405 971	100.00
Arable land	1 413 739	58.76
Hop-fields	515	0.02
Vineyards	26 964	1.12
Gardens	76 568	3.18
Orchards	16 861	0.70
Permanent grassland	871 324	36.22
Total area of SR	**4 903 557**	**-**

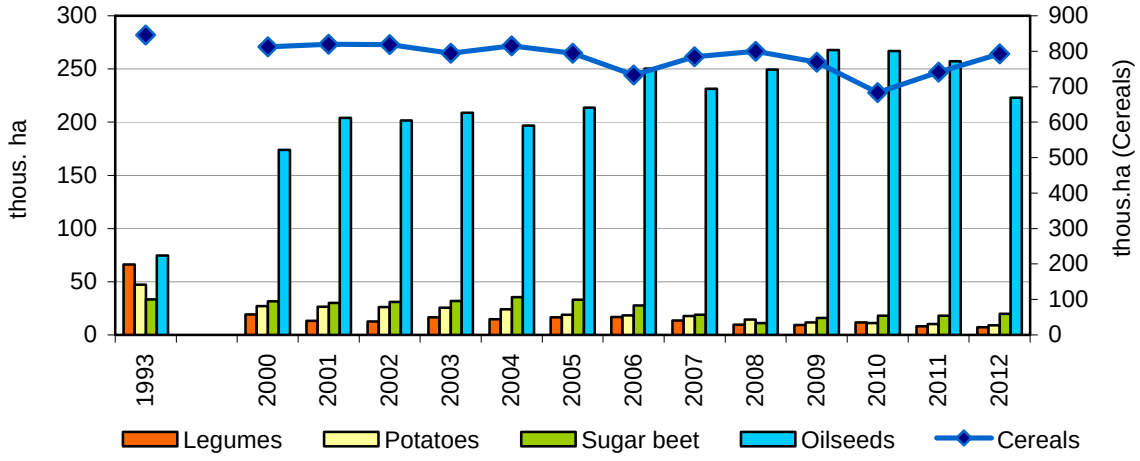
Source: GCCA SR

In 1970, the size of arable land represented 0.37 ha per capita, in 1990 it was 0.28 ha, and 0.2613 ha in 2012.

♦ Plant production

In 2012, **harvest areas of legumes, oilseeds and potatoes** decreased on an annual basis. Harvest areas of grains and sugar cane increased from year to year.

Harvested areas of agricultural crops



Source: SO SR

Growing genetically modified crop in agricultural production in Slovakia follows the provisions of Act 184/2006 Coll. on growing genetically modified crop in agricultural production, and the provisions of

Decree 69/2007 Coll. Central Controlling and Testing Institute in Agriculture in Bratislava (ÚKSÚP) has been the body commissioned to oversee the compliance with this legislation. In 2012, total area of sown authorised **genetically modified corn** resistant to the European corn borer (MON 810) was 188 ha, which represent a decline by 573 ha, compared to 2011.

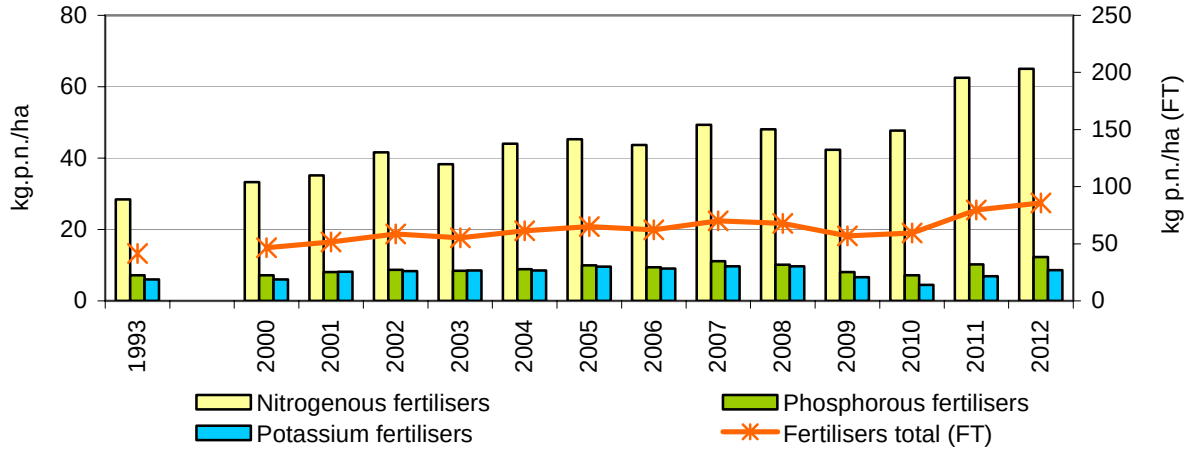
Areas of genetically modified crop in the SR

	2006	2007	2008	2009	2010	2011	2012
Area with sown genetically modified corn (in ha)	33	949	1 942	875	1 249	761	188

Source: CCTIA

In 2012, consumption of industrial fertilisers was **85.8 kg** of pure nutrients per hectare of agricultural land.

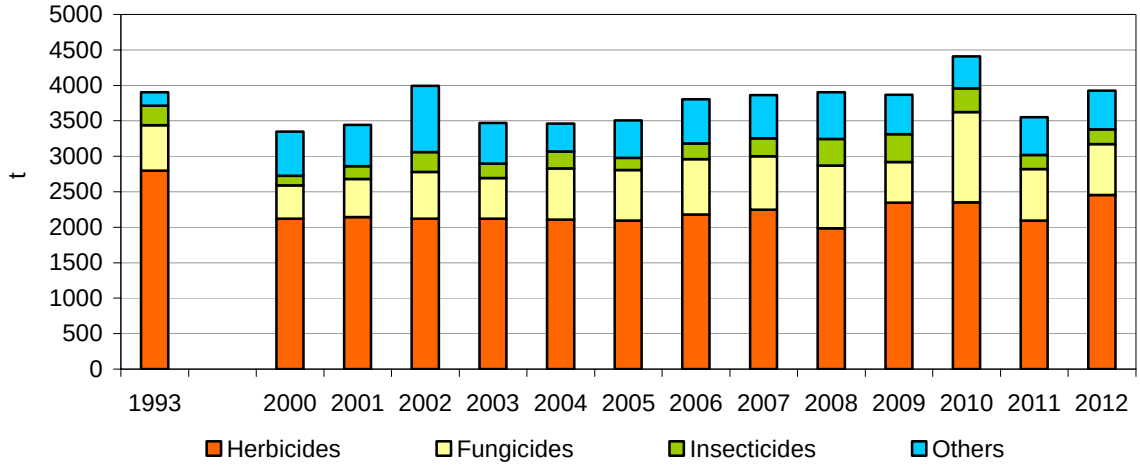
Fertilisers consumption



Source: SO SR

Consumption of pesticides in 2012 annually grew by 372 tons when compared to 2011. Altogether, 3 925 t of agents were applied to protect the crop, including 2 457 t of herbicides, 713 t of fungicides, 212 t of insecticides, and 543 t of other agents.

Pesticides consumption



Source: CCTIA

♦ Animal production

In 2012, **the numbers of all livestock grew annually.** Most significant growth was recorded in raising pork and poultry.

Number of livestock

Source: SO SR

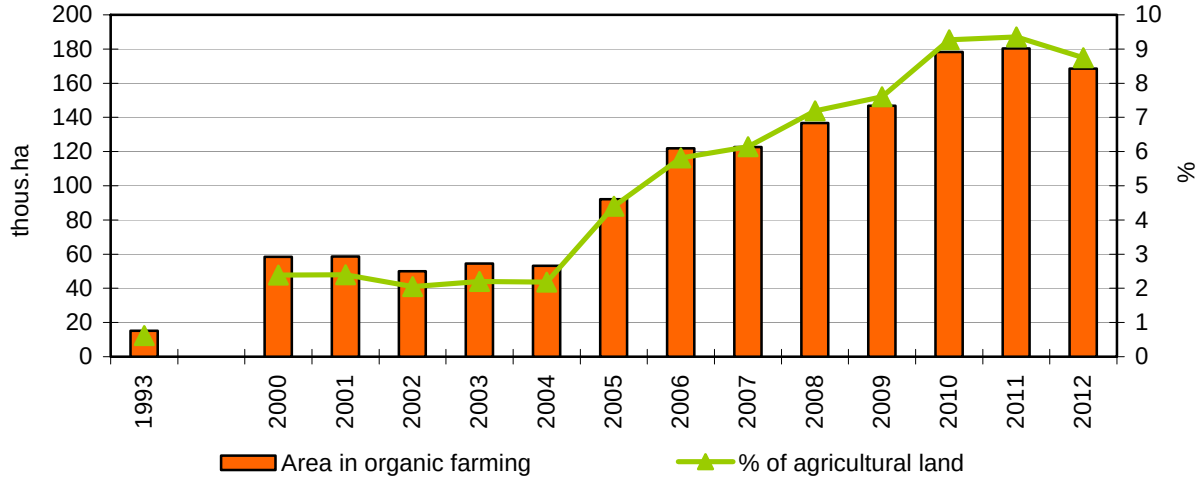
♦ Irrigation

In 2012, **24 847 ha** of agricultural land was **irrigated,** which represents an increase by 11 040 ha, compared to 2011.

♦ Organic farming

In 2012, the system of ecological agriculture in the SR included **362 subjects** operating on **168 602 ha of agricultural land**, which is 8.75% of total agricultural land. Compared to 2011, it is a decline by 11 659 ha.

Trend in the organic farming area



Source: CCTIA

♦ Demand of agriculture on the exploitation of resources

In 2011, there was an annual decline in the consumption of heat, solid, and liquid fuels. On the contrary, increased consumption was recorded on an annual basis in the consumption of electricity and gas fuels.

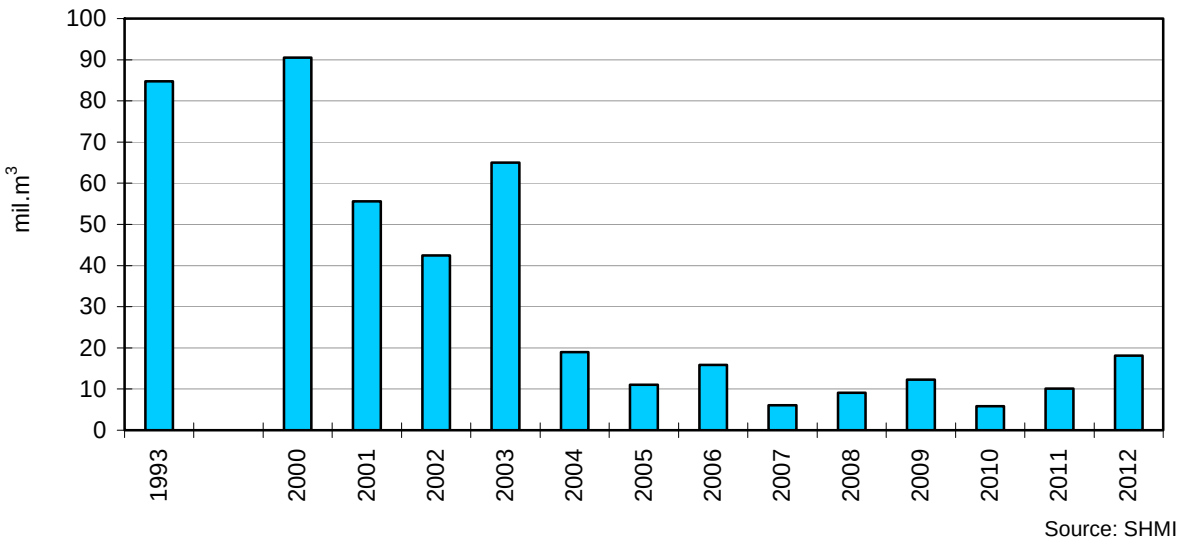
Consumption of selected fuel types, heat, and electricity in agriculture (TJ)

Kind of fuel	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Solid fuel	133	131	82	65	55	58	45	33	33	22
Liquid fuel	2 665	2 987	3 250	3 423	3 000	2 874	3 001	2 703	2 839	2 835
Gas fuel	1 869	1 316	1 781	1 670	1 263	1 137	1 257	1 140	1 340	1 617
Heat	312	323	203	201	189	231	226	187	164	141
Electricity	1 850	1 796	1 530	1 411	1 325	1 278	1 195	1 152	1 030	1 080

Source: SO SR

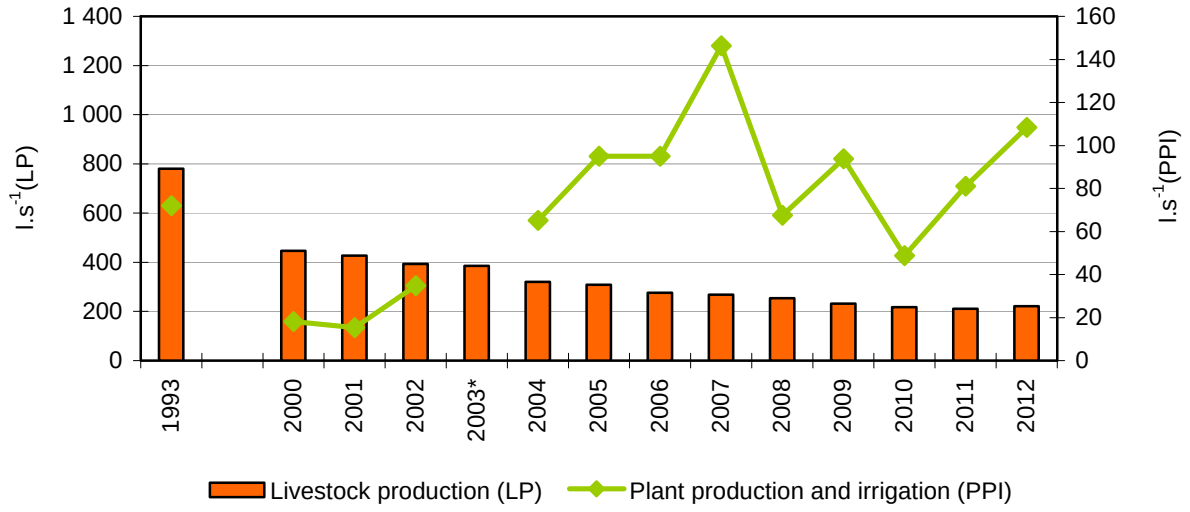
In 2012, surface water abstractions for irrigation reached the value of 18.138 mil.m^3, which is 78.9% more than in the previous year. Volumes of groundwater in agriculture increased by 38.3 l/s in 2012, compared to 2011.

Trend in the use of surface water for irrigation



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 bio-fuels contains mainly oilseeds and grains 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 2012, there were **38 bio-gas production facilities** in operation in Slovakia with total bio-gas production of 98 424 thous.m^3.

From October 1, 2011, Decree of the Ministry of Labour, Social Affairs and Family no 295/2011 Coll. came into effect. The Decree appoints VÚPOP as the organisation that administers and updates the database of areas where the grown biomass designed for the production of bio-fuel or bio-liquid complied with the criteria of sustainability and where at the same time we may expect that greenhouse gases emissions from growing feedstock do not exceed the limits imposed by special provisions.

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	580 482	2.57	1 491 838.74
Maize	212 336	6.61	1 403 540.96
Sunflower	90 121	6.79	611 921.59
Rapeseed	106 389	6.37	677 697.93
Orchards	8 114	3.58	29 048.12
Vineyards	10 492	2.49	26 125.08
Flight from permanent grasslands	76 285	1.95	148 755.75
Total	**1 086 231**	**4.39**	**4 390 940.17**

Source: ATaTI

♦ Impact of agriculture on environment

The sector of agriculture in 2011 contributed with 6.9% to total greenhouse gases emissions. Agricultural production processes produce mainly methane (CH_4), nitrous oxide (N_2O), and less carbon dioxide (CO_2) and halogenated carbohydrates.

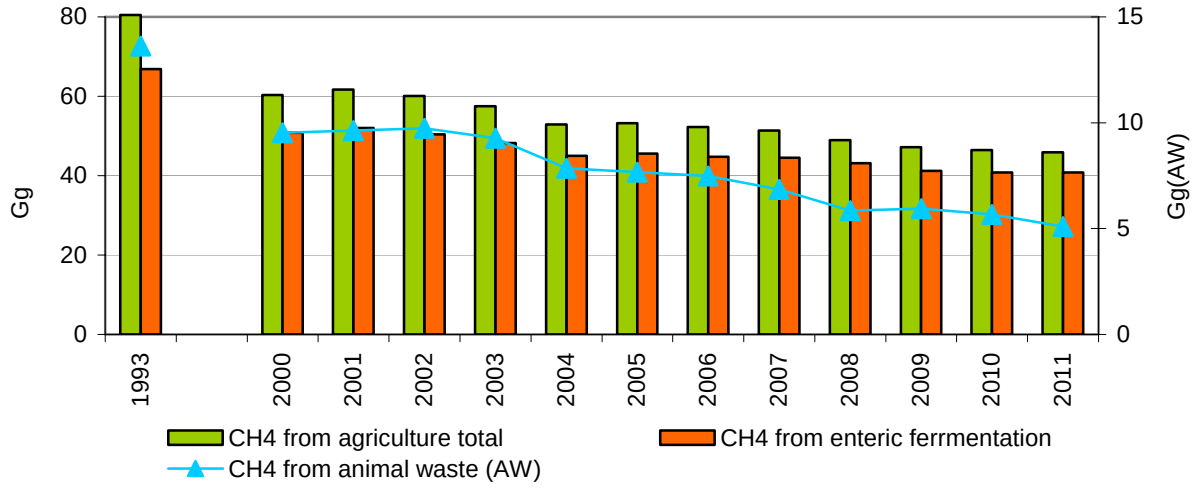
Agriculture belongs to the biggest producers of methane (livestock production) - large-scale cattle and pork farms. Methane originates as a direct product of metabolism in herbivores (enteric fermentation) as well as a product of animal excrements breakdown.

Share of agriculture on total methane production has been mostly falling since 2000 due to decreased number of livestock. In 2011, agriculture produced 45.92 thous. tons of methane.

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).

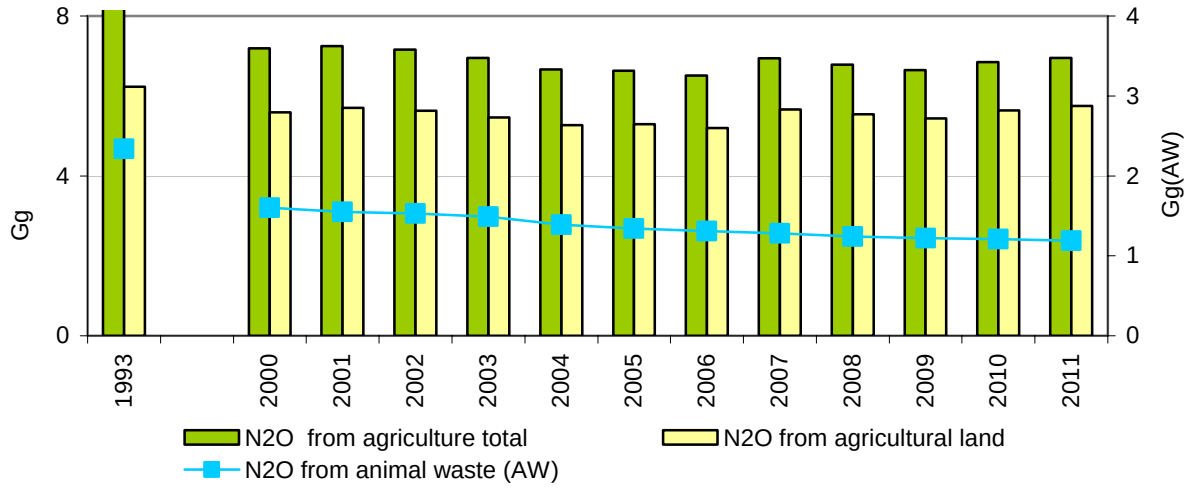
Production of nitrous oxide by agriculture after 2000 has been mostly uniform. In 2011, agriculture produced 6.95 thous. tons of nitrous oxide.

Trend in methane emissions from agriculture according to type of activity



Source SHMI

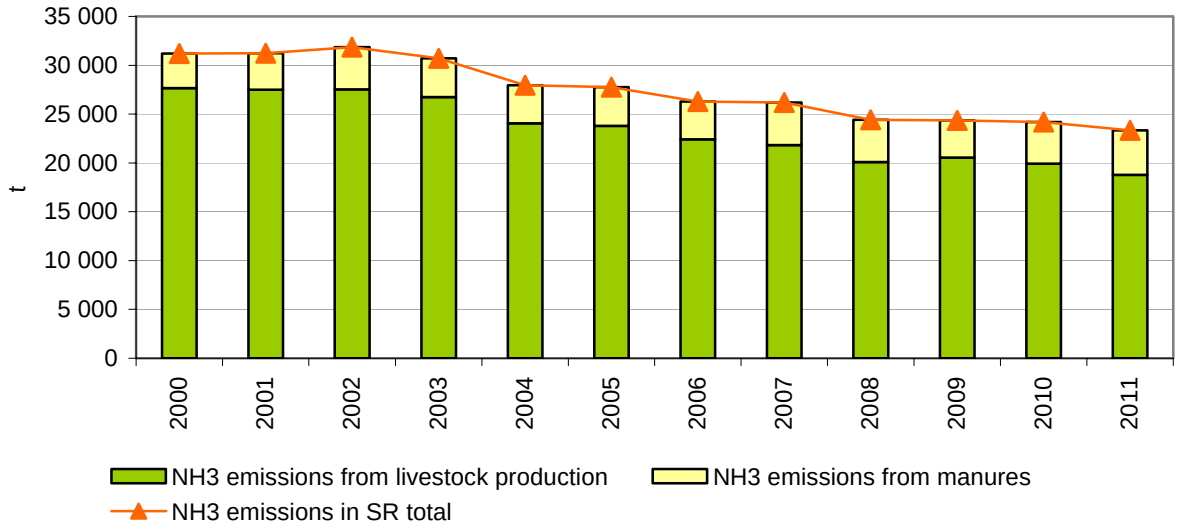
Trend in nitrogen monoxide emissions from agriculture according to type of activity



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 2000 in Slovakia.** In 2011, agriculture produced 23 349 tons of emissions.

Trend in ammonia emissions from agriculture



Source: SHMI

In 2012, the total of 370 466 m^3 of waste water related to agricultural production were discharged.

Discharged amount of waste water related to agriculture in 2012

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	242.559	1.210	2.842	16.764
Untreated	127.907	0.000	0.000	0.000
Total	**370.466**	**1.210**	**2.842**	**16.764**

Source: SHMI

In 2012, there were **505 924.6 tons of hazardous and other waste introduced to the market,** which is by 21 443 t **less than in 2011.** Of total volume of waste from agricultural activities, other waste represented 98.9%, and hazardous waste represented 1.1%.

Forestry

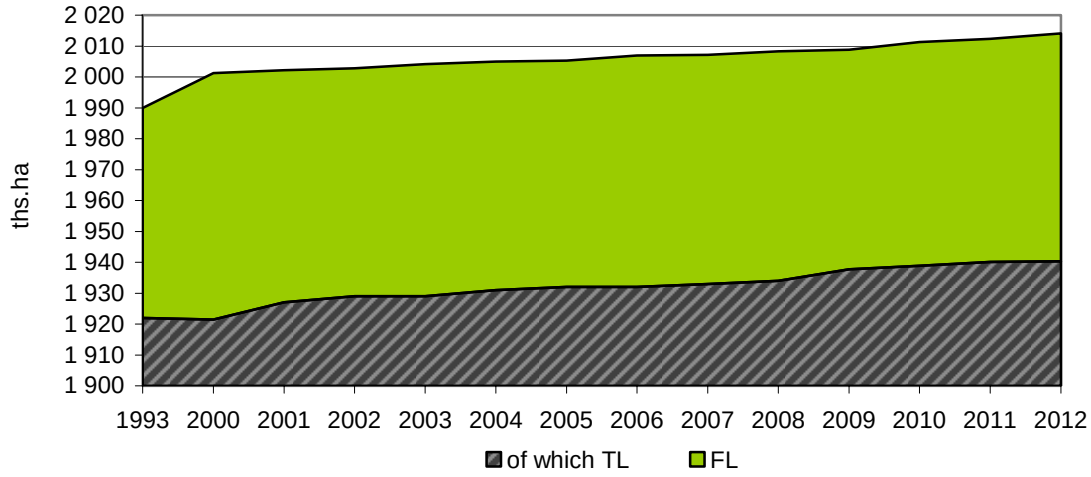
♦ Size and structure of forest land

Size 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 2012 reached **2 014 059 ha** (annual increase by 1 723 ha), which represents the area of **41.07%** of the Slovak territory (data supplied by IGCC SR). **Timber land** in 2012 represented app. 96.3% (1 940 300 ha) of total size of forest land. Calculated to the number of inhabitants, this represents 3.59 km^2 per 1 000 inhabitants.

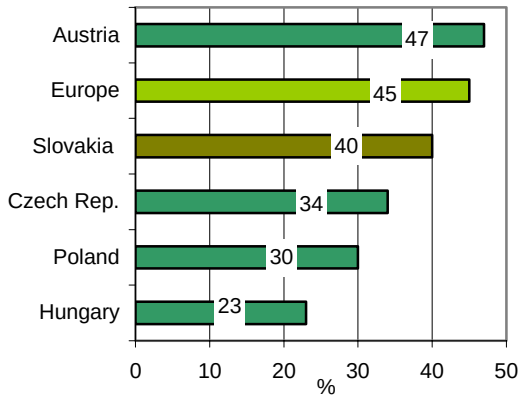
Increase in the size of forest in the recent years has been caused mainly by harmonizing the actual state with the state recorded in the register of immovable property and in the forest care programmes.

Trend in forest land (FL) and timber land (TL)



Source: IGCC SR

Comparison of forestation in selected countries

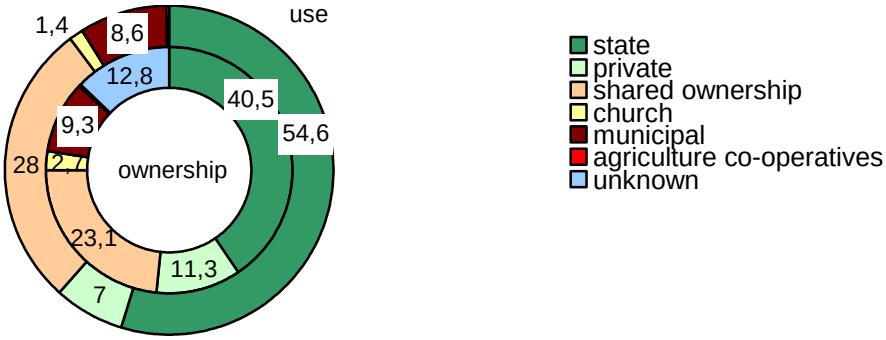


Source: FAO 2010

Ownership structure of forests

The process of **settlement of ownership and use-related rights** to forest land still continues under the effective restitution laws. In 2012, total monitored timber land in Slovakia pertaining to so-called **unknown owners** in Slovakia was **12.8%** (248 469 ha). **State** organisations **owned** in total **40.5%** of timber land (785 851 ha; compared to the previous year, this share declined by 0.3%) and administered as much as **54.6%** of timber land (1 059 297 ha; annual decline by 0.5%).

Structure of forests ownership and use

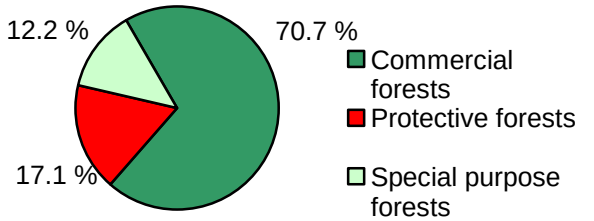


Source: NFC

Forest categorisation

Most frequently represented category is **commercial** forests (compared to 2011, their share increased by 0.3% at the expense of special purpose forests), followed by protective forests. Least represented forest category is special purpose forests. Majority of commercial forests belong to poly-functional forests that also have other associated ecological and social functions, while only 20.8% of commercial forests are located in purely production type.

Spatial representation of forest categories

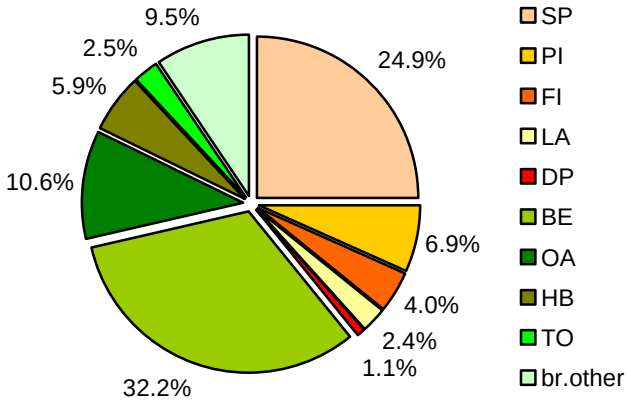


Source: NFC

Forest composition by species

Forest composition by species of Slovak forests is relatively diverse. There has been a gradual **decline in coniferous** trees (mainly spruce) especially due to the negative impacts of biotic and abiotic injurious agents. In terms of stability, however, this is a positive trend. Still, the favourable share of **broad-leaved** trees remains. Beech (32.2%) and spruce (24.9%) have long shown the **greatest** share. Spruce is expected to decline significantly. **The outlook** is to reach the share of broad-leaved trees at 63% (with their initial share having been as much as 79.3%) and a 37%-share of coniferous trees (with their initial share having been only 20.7%).

Share of the most significant tree types in the Slovak forests



Source: NFC

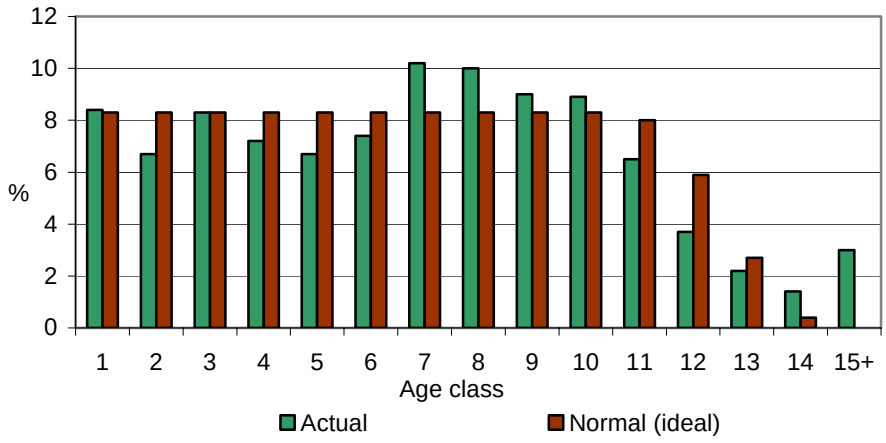
Note: SP - spruce, PI - pine, FI - fir, LA - larch, DP - dwarf pine, BE - beech, OA - oaks, HB - hornbeam, TO - turkey oak, br. other - broadleaved other

Our forests contain also **introduced trees species** (e.g. *Robinia pseudoacacia*, euroamerican poplars, *Pinus nigra*, and also *Pseudotsuga menziesii*, *Abies grandis*, *Pinus strobus*, *Quercus rubra*, *Castanea sativa*, *Aesculus hippocastanum* and *Negundo aceroides*). There are altogether **25 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.

Forest age composition

Real **forest age composition** of SR partially **differs** from the normal (theoretical) one. Most of them fall into the following age categories: 2,4,5,7,8,12, and 15. The age categories of 1-4 contain 30.5% of forests, the categories of 5-9 contain 43.3%, and the categories of 10 and beyond contain 25.8% of forests, with **clearing areas** taking up the size of 8 607 ha.

Age composition of the SR forests



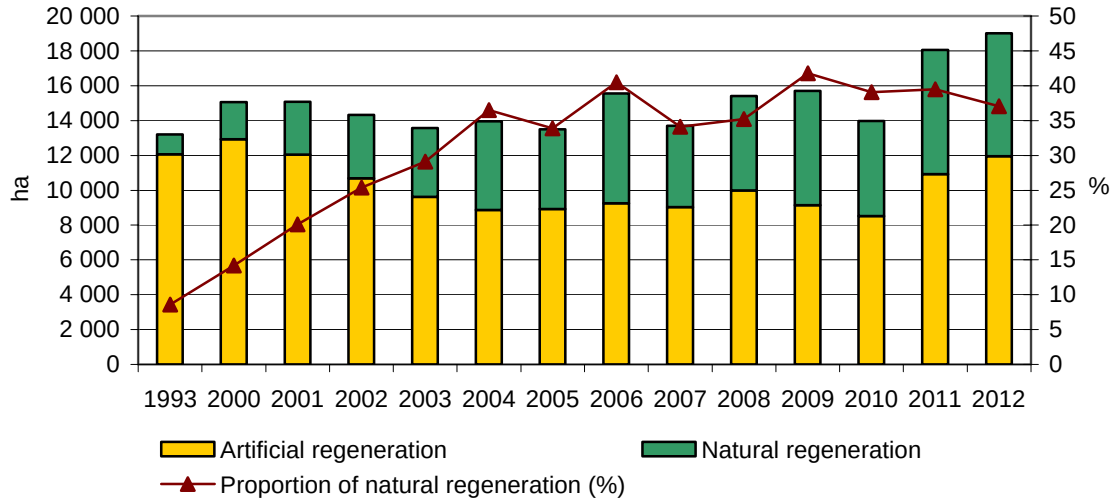
Source: NFC

♦ Forest management

Forest regeneration and afforestation

Compared to 2011, total scope of **forest regeneration** increased by 5.3%, to the present size of **19 011 ha**, of which **natural** regeneration slightly declined. Share of natural regeneration on total forest regeneration in 2012 reached **37.1%** and roughly has remained as such over the last years.

Trend in forest regeneration

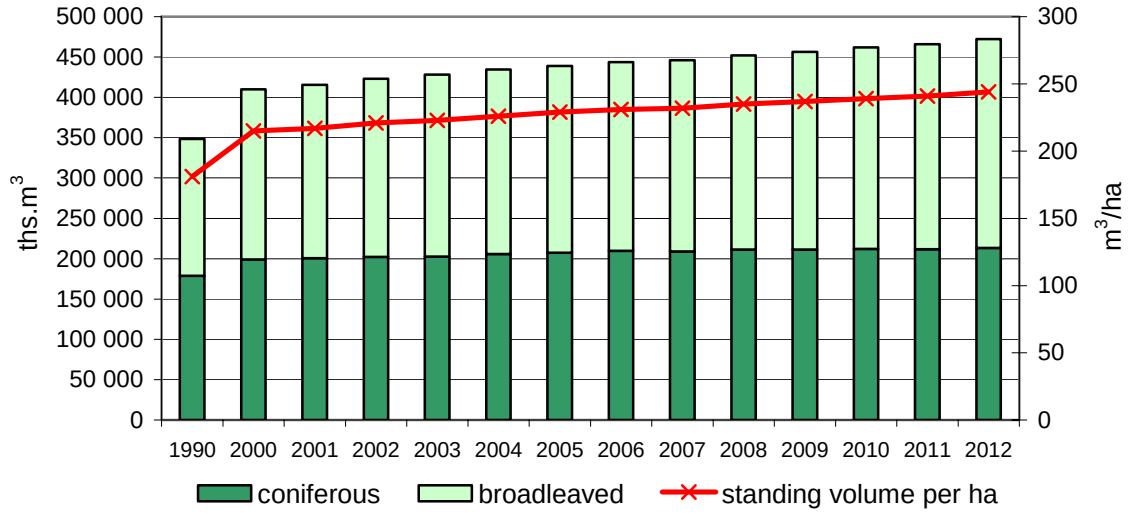


Source: NFC

Timber and carbon stocks

In the long-term horizon, **standing volume** in the Slovak forests has been on the rise, in 2012 reached **472.2 mil. m^3** of barkless wood matter. This has been 6 mil. m^3 more than in the previous year. Similar growth is shown in the average stock **per hectare** which represents **244 m^3**. The shown increase in standing volume has been mainly affected by the disproportion between the increment and the timber felling, which relates to a higher representation of forests within the 7-10 age categories.

Trends in total standing volume



Source: NFC

Carbon stocks in forest ecosystems, surface and underground biomass, have been continuously rising, which is related to and impacted by the increasing standing volume. Presently, it represents **529 mil. tons**, which is an increase by 3 mil. tons compared to 2011.

Timber felling and the forest resources utilisation

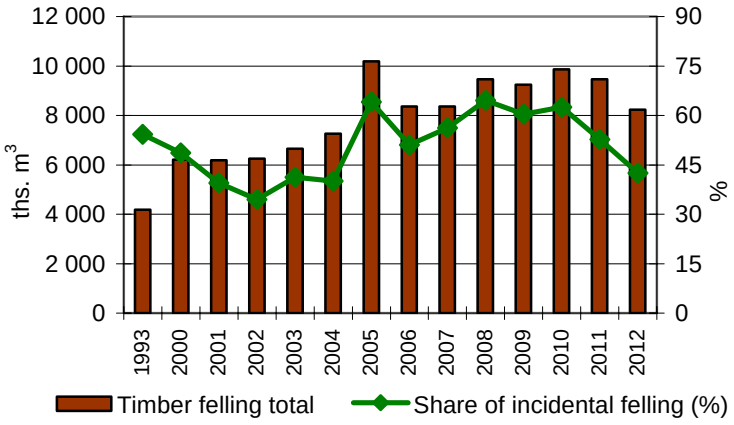
In 2012, timber felling reached **8 232 thous.m^3**, which is by 1 235.4 thous.m^3 (13%) less than in 2011. Since 2010, the historically rising trend in timber felling caused by large-scale incidental felling provoked by injurious agents has been declining. Compared to the previous year, the share of **incidental felling declined** by 10.1% to **42.6%** of total timber felling. Compared to 2011, even with the high volume of incidental felling of coniferous trees (as much as 67.8%), the volume of total planned timber felling in 2012 was not exceeded. **Intensity of forest resources utilisation** (share of felling volumes and increment) for this year is 67.9%, which represent decrease of 10.8% as compared to 2011.

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

Total felling volume	**8 232**
of which: coniferous	4 592
broadleaved	3 640
Incidental felling	**3 504**
of which: exhalation	77
insectual	1 889
disaster	1 257
other	281
share of incidental felling on total felling volume (%)	**42.6**

Source: NFC, SO SR

Trend in total volume of timber felling and share of incidental felling



Source: NFC

Forest transport

In 2012, density of forest accessibility by **transport network** has not changed much compared to the previous year, and represents 20.3 m/ha (increase by only 0.1 m/ha). Total length of forest transport network grew by 41 km and reached 40 740 km in 2012.

Forest certification

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		259	5	**264**
Forest size	**ha**	1 239 122	147 588	**1 386 710**
	% of timber land	63.9	7.6	**71.5**

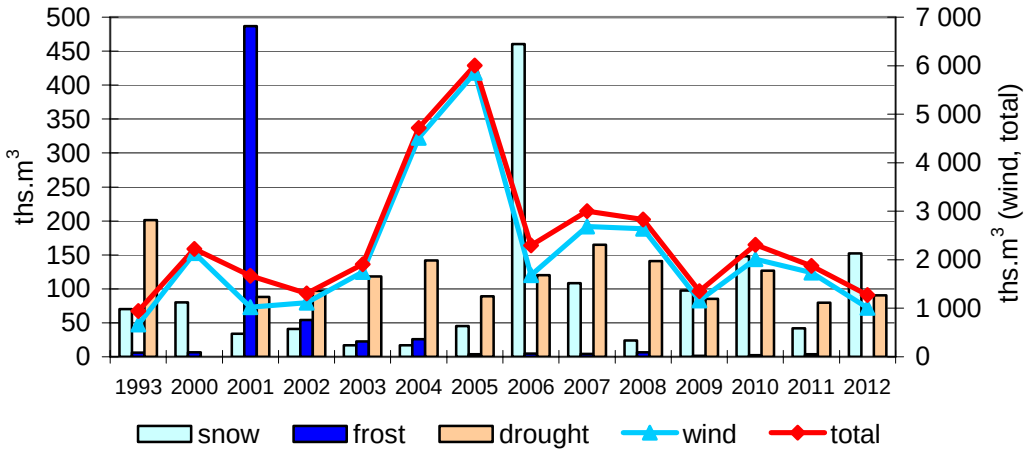
Source: Slovakia Forest Certification Association; www.fsc-info.org

♦ Injurious agents and forests condition

Abiotic injurious agents

As a consequence of negative impacts of wind, snow, frost, drought, and other **abiotic factors**, there was **1 272.5 thous. m^3** of wood matter damaged in 2012 (of which 920.4 thous.m^3 were coniferous trees), which is decrease by 604.5 thous.m^3 compared to the previous year. About 79.4% was caused by the wind. Processed was 98.8% of the wood matter.

Trend of damages caused by abiotic agents



Source: NFC

Biotic injurious agents

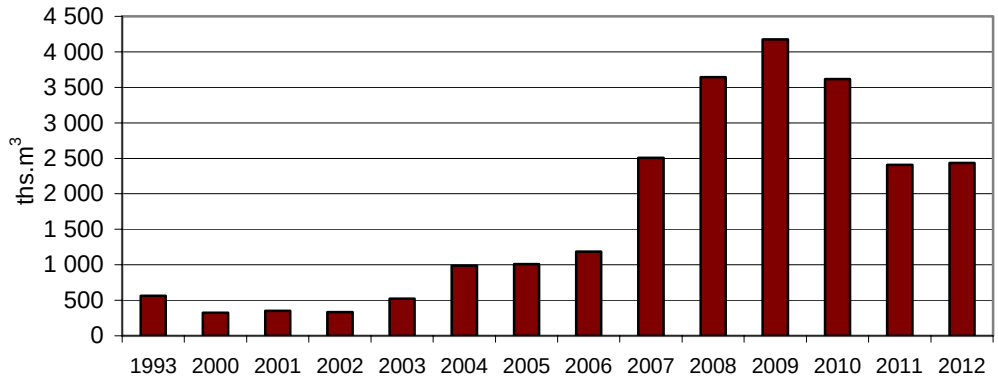
Among the **biotic injurious agents** to forest stand, most impacts have still been caused by bark-beetles and woodworms on incidental felling. This factor poses a threat to spruce forest ecosystems. However, damage caused by these factors has been reduced over the last 3 years.

In 2012, **bark-beetles and woodworms** damaged **2 436.9 thous.m^3** of wood matter (of which 2 430.7 thous.m^3 were coniferous trees), which is a slight increase compared to the previous year (by 27.5 thous.m^3). Of this volume, 87.6% has been processed. **European spruce bark beetle** is the most significant injurious agent, with more than 89% contribution to total affected wood matter.

Leaf-eating insects recorded increased activities again after 2 years and the related damage to **2 544 m^3** of wood matter.

In total, **phyto-pathogenic organisms** damaged **238.7 thous.m^3** of wood matter (mostly coniferous tree species) with **Armillaria** being the most significant pathogenic agent contributing to total damage by as much as **94%**.

Trend of damages caused by bark beetles and woodworms



Source: NFC

Anthropogenic injurious agents

In 2012, anthropogenic injurious agents accounted for **104.7 thous.m^3** of damaged wood matter, which is an **increase** by 31.2% compared to 2011. **Air pollution** contributed with as much as 73%, and thefts of wood accounted for 17%. Most damaged were coniferous trees (as much as 90%).

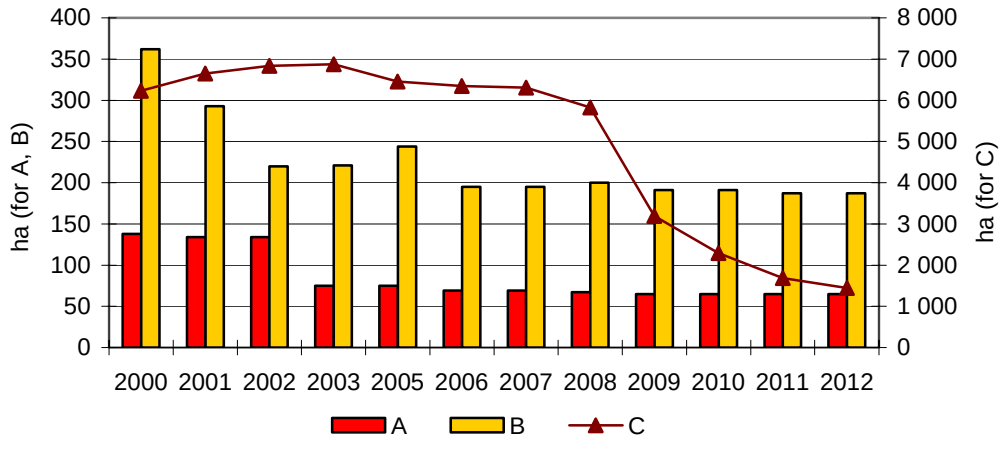
In 2012, individual **zones threatened by air pollution** were defined, taking up the area of **3 439 ha** (of which 82.9% were coniferous trees) which is 206 ha **less** than in the previous year. This has been caused by a **long-term gradual reduction** in the size of these zones as well as by the volume of calamity wood mass caused by air pollution.

Structure of forest damage caused by anthropogenic injurious agents

Agents	2011		2012	
	Affected	Processed	Affected	Processed
Immisions	66 052	61 580	76 752	76 735
Fires	1 870	1 866	8 291	8 291
Wood stealing	10 364	10 364	17 943	17 943
Other anthropogenic agents	1 538	1 534	1 748	1 748
Total	**79 824**	**75 316**	**104 734**	**104 717**

Source: NFC

Trend of forest damage in individual threatened zones



Source: SO SR

In 2012, Slovakia recorded **517 forest fires** (214 less than in 2011) on the territory of **1 683.5 ha** (compared to 403 ha in 2011) with direct damage amounting to 793.86 thous. EUR. Increase in the number of fires compared to the previous year related mainly to the dry character of seasonal weather. Most frequent **causes** of fires in forests include burning of dried grass and vegetation and negligence (setting fires in the nature, children, etc.).

Monitoring of forest condition

National programme of **forest ecosystems health condition monitoring** was implemented also in 2012. 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.

Results of forest condition monitoring in 2000-2012

Year	Tree types	Representation of trees in various damage degrees in %							
		0	1	2	3	4	1-4	2-4	3-4
2000	Coniferous	18	44	35	2	1	82	38	3
	Broad-leaved	29	57	13	1	0	71	14	1
	Total	25	52	22	1	0	75	23	1
2005	Coniferous	6	59	33	2	0	94	35	2
	Broad-leaved	21	65	13	1	0	79	14	1
	Total	14	63	22	1	0	86	23	1
2010	Coniferous	6	48	44	2	0	94	46	2
	Broad-leaved	12	55	32	1	0	88	33	1
	Total	10	52	37	1	0	90	38	1
2011	Coniferous	4,3	49,1	43,2	1	2,4	95,7	46,6	3,4
	Broad-leaved	12,7	60,9	25,9	0,5	0	87,3	26,4	0,5
	Total	9,2	56,1	33	0,7	1	90,8	34,7	1,7
2012	Coniferous	6,7	49,8	41,8	1,5	0,2	93,3	43,5	1,7
	Broad-leaved	14,6	51,5	32,6	1,3	0,0	85,4	33,9	1,3
	Total	**11,4**	**50,7**	**36,4**	**1,4**	**0,1**	**88,6**	**37,9**	**1,5**

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

Compared to 2011, proportion of trees in 2-4 damage degrees for all tree types together **grew by 3.2% in 2012**. Proportion of coniferous trees in 2-4 damage degrees sank by 3.1% compared to the previous year, while the proportion of broad-leaved trees in the same degrees increased by 7.5%. **Larch** belongs to the **most damaged** tree type (increase by 10.3% in damage compared to 2011) followed by fir (by 3.4%), spruce (decline by 5.6%), and pine (decline by 1.4%).

Assessment of tree defoliation in selected European countries to 2011

Country	Number of assessed trees	Damage degree (%)				
		0	1	2	3+4	2+3+4
Czech Republic	5 418	15.2	32.1	50.9	1.8	52.7
Hungary	1 830	62.3	18.8	13.8	5.1	18.9
Poland	7 342	14.0	62.1	22.9	1.1	24.0

Austria	in 2011 non-realised					
Slovakia	4 017	9.2	56.1	33.0	1.7	34.7
EÚ	88 370	29.2	46.6	21.4	2.8	24.2

Source: NFC

♦ Relating activities and sectors

Nature protection and forest management

Forest land in **protected areas** (PA) currently take up as much as approximately **78%**, with forestation of **national parks** including their protective zones being **72%, PLA 71%, and "small-size" PA 71.7%**. It is a testimony of the quality and level of conservation of forest habitats, as well as to the adequacy of recent approaches to their conservation.. Forestry activities are totally inadmissible only within the strictest (5th) degree of protection.

Protected areas (2. degree of nature protection and higher) take up 1 132 037 ha within the total size of forest land, which represents **56.3% of total forest land size**. Size of national parks and protected landscape areas on forest land has not changed, compared to 2011. Such size of protected areas with their related limitations **has an impact on the ownership rights** and **cause material losses**.

Wood biomass for energy production

In the case of **use of potential sources** of wood biomass, **dendromass for fuel** may reach as much as 9% in the annual consumption of primary energy sources in Slovakia. Total annual usable potential of dendromass for fuel today represents 2.8 mil. tons and has been used on only 33%.

Available data for 2012 show that **3.8 mil. tons of** wood biomass were **consumed** by households, energy sectors, wood-processing industry, and other producers and consumers. **The sector of forest management** introduced to the market **1.31 mil. tons** of biomass for fuel in the form of fuelwood and wood chips. **Current supply** of biomass for fuel **covers up** approximately **1.5%** of the consumption of primary energy sources in Slovakia.

Trend in the volumes of dendromass in the forest management sector for energy production

	Wood chips		Fuelwood and other		Total	
	ths. t	TJ	ths. t	TJ	ths. t	TJ
1990	2	19	368	3 496	370	3 515
2000	5	48	471	4 475	476	4 523
2005	120	1 140	640	6 080	760	7 220
2010	250	2 375	695	6 602	945	8 977
2011	270	2 565	700	6 650	970	9 215
2012	530	5 035	780	7 410	1 310	12 445

Source: NFC

Game management

In 2012, **1 861 hunting areas** existed in Slovakia. Compared to the previous year, their **total size** reduced by approximately 21 thous. ha and takes up **4 442 thous. ha**. Of this, agricultural areas represent 53%, and forest land represents 44.4%.

Spring stock of game (SSG) of **ungulate game** were **stabilised** in 2012 and it was possible to stop their negative trend over the recent years, Nevertheless, damage caused by game especially in agriculture

increased. Their planned **hunting** by shooting was comparable with 2011, with the exception of wild boar where the numbers to be reduced by shooting were increased by 14 thous. individual animals.

In relation to **small game**, their SSG continue to decline. Numbers of **big predators** has been statistically assessed as stable, with a positive trend in their population. As to the other **rare game species**, population growth has been recorded in the number of the beaver. On the contrary, adverse trend exists in the populations of moorcook and wood-grouse. Hunting of rare game species is strictly regulated. 149 wolves and 47 bears were taken down.

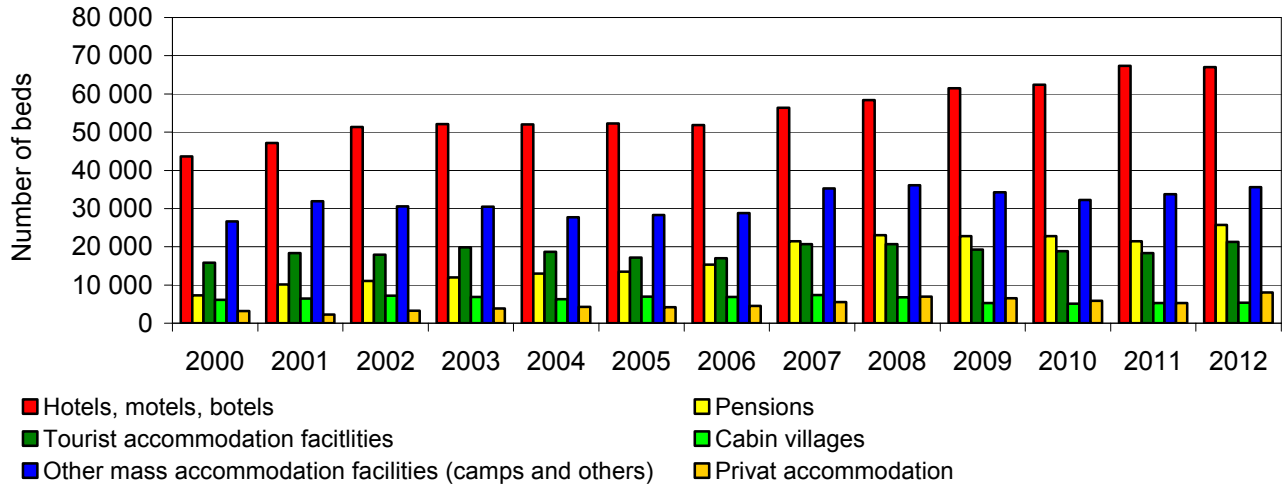
In 2012, forest sector and agricultural sector reported **damage caused by ungulate game** amounting to **1 338 thous. EUR**, which is an increase by 226 thous. EUR, compared to 2011. 12.5% of damage has been compensated. Damage caused by **large predators** amounted to **783 907 thous. EUR** (increase by 124 thous. EUR), of which only 3.5% has been compensated. Most damage has been caused by **wolves** (76.8%). In 2011, 47 attacks by brown bear on humans were recorded.

Recreation and Tourism

♦ Specific analysis of recreation and tourism

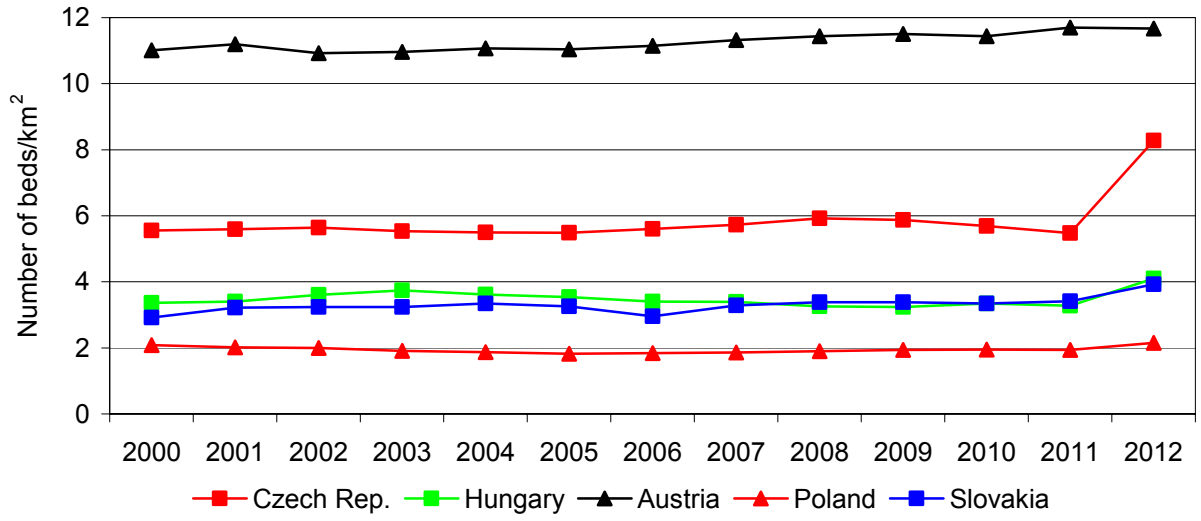
In 2011-2012 there was a significant **increase** in the number of beds. Specifically, major increase in the number of beds was in private accommodations (by more than 52.2%), followed by increased numbers of beds in boarding houses (increase by 20%), tourist accommodation facilities (increase by 15.6%). A very slight increase was recorded in other mass accommodation (increase by 5.5%), cabin villages (increase by 2.4%). On the contrary, a very **small decline** was recorded only in hotels, motels and botels (decline by 0.5%). In view of long-term trends (comparison between 2000-2012) number of beds in all monitored accommodation categories increased.

Number of beds in accommodation facilities in the Slovak Republic in the years 2000-2012



Source: SO SR

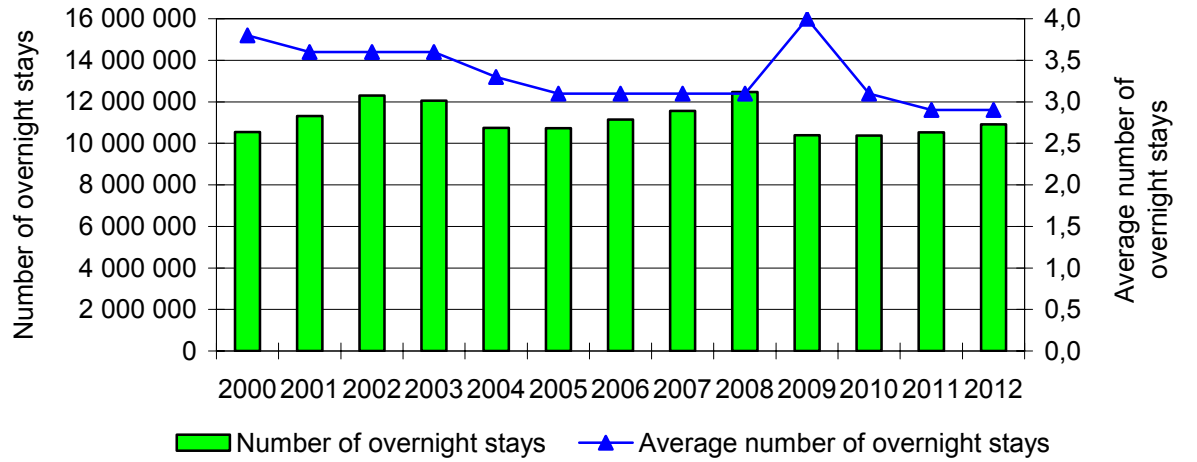
Tourist density (number of beds/km^2) in selected countries in 2000-2012



Source: SO SR

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 importantly; however, in the period of 1999-2008, average number of overnight stays declined continually. This relates to the attractiveness of the tourist destination and the level of development of its infrastructure. This is what influences the length of actual stays. **In 2012,** compared to 2011, **there was a slight increase in the number of overnight stays (by 3.6%) with the average number of overnight stays remaining unchanged.**

Performance of accommodation facilities in the Slovak Republic in 2000-2012



Source: SO SR

♦ Demand of tourism on exploitation of resources

In terms of national economy, **tourism with its little demand on material resources does not represent a significant demanding sector**. This fact is especially important for a country like Slovakia, that depends much on import.

Demand of tourism on the exploitation of natural resources and land occupation is **important especially on the local** level. This phenomenon is caused by major seasonal differences in the number of tourists to individual tourist destinations. Compared to other economic activities, **it is not possible, for example, to supply data on the energy and material demand of tourism**, due to the lack of good data retrieving and collecting mechanisms to meet specific indicators. **Tourism** being a sector of economic activity **does not have high demands on water or fuel consumption.** These requirements; however, are in general more typical for major fluctuations between the high and low tourist seasons.

♦ 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 Tatra National Park (NP), Low Tatras NP, and the Malá Fatra NP. 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 NP, NP Muránska Planina and the NP Slovenský raj**.

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 Planina NP. In 2004-2008, significant increase in erosion of marked hiking trails** was recorded also **in the territory of the Tatra NP. On the contrary, significant or slight decline in the erosion** of tourist marked trails in 2009 was recorded in the territory of the **Pieninský NP, and a slight decline appeared in the Veľká Fatra NP. In 2011, there was a slight increase in the length of erosion-affected cyclo-tourist trails in the territory of the Tatra NP. Veľká Fatra NP recorded a very slight increase in the length of erosion-affected tourist marked trails. In 2012, the territory of Tatra National Park showed a slight increase in the length erosion-affected tourist marked trails.**

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

Categories of protected areas take up 60-80% of the assessed impacts into nature and landscape that require permission of a pertinent nature protection authority (especially the areas of Tatra NP, Low Tatras NP, Slovenský raj NP and Malá Fatra NP). In terms of the categories of protected areas, **most assessed impacts** over the period of 2003-2012 **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, with the exception of the years 2008 and 2009.**

• WASTE

Key questions and key findings

Is the production of waste placed on the marked being reduced?

- **In 2012 were generated 8 668 104.18 tonnes of waste introduced on the market. When compared with 2011, waste introduced on the market in Slovakia decrease app. 20% in 2012.**
- **There were generated 1 747 569.05 tons of total municipal waste in Slovakia in 2012. This volume represents 323 kg of municipal waste per capita. Compared to 2011, this is an decrease 1.2%. When compared with the EU countries, generation of the municipal waste per capita is low, still below the average EU 27 value.**

Is the proportion of landfilled waste decreasing?

- **There has been a long and negative high share of waste landfilling on total waste disposal almost 81% for waste other than municipal, and 74% for total handled municipal waste**

Is Slovakia complying with the waste limits set forth by international criteria?

- **In 2012, 4.2 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.**
- **Slovakia managed to comply with the obligation to collect and reclaim waste from electrical and electronic equipment. (WEEE)**

Is packaging waste reclamation on a rise?

- **Of total volumes of generated packaging waste in 2012, 59.8% of waste was recycled, and 62.4 % was recovered.**

♦ Waste generation

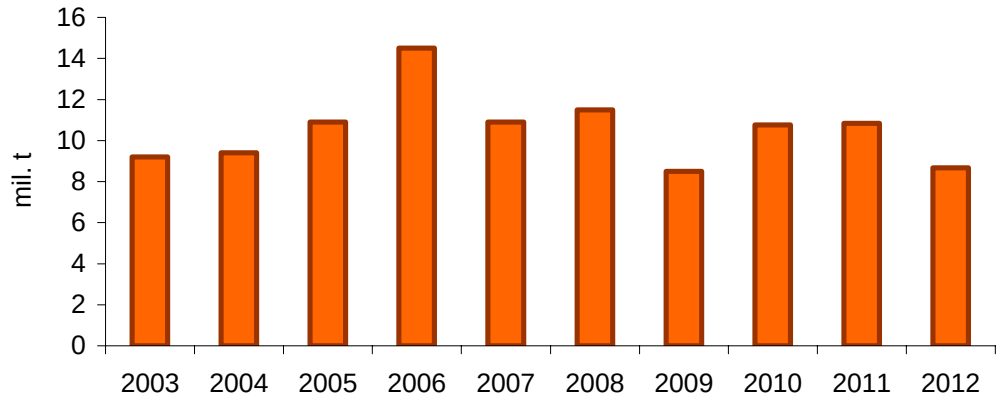
When compared with 2011, decrease in waste introduced on the market shows app. 20% in 2012.

Waste generation in 2012 (t)

Waste category	Amount (t)
Hazardous waste	371 553.28
Other waste	6 548 981.85
Municipal waste	1 747 569.05
Total	**8 668 104.18**

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.*

In the area of waste generation by economic activities classification SK NACE, manufacturing industry has been the dominating component over the recent years, with 38% share in 2012. Sector of Electricity, gas, steam and air conditioning supply follow with 15% and sector of Construction with 12%. 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 2012 (t)

SECTION	Total (t)	Hazardous waste (t)	Other waste (t)
A - Agriculture, Forestry, Fishery	549 390.77	5 554.82	543 835.95
B - Mining and quarrying	310 579.33	645.98	309 933.34
C - Manufacturing	2 644 941.77	203 213.95	2 441 727.82
D - Electricity, gas, steam and air conditioning supply	1 045 757.25	4 603.30	1 041 153.96
E - Water supply; sewerage; waste management and remediation activities	670 564.62	79 384.21	591 180.42
F - Construction	806 186.76	34 082.02	772 104.74
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	337 444.57	13 154.63	324 289.94
H - Transporting and storage	112 606.17	11 994.20	100 611.97
I - Accommodation and food service activities	3 234.32	102.62	3 131.70
J - Information and communication	4 599.74	421.47	4 178.27
K - Financial and insurance activities	532.29	53.03	479.26
L - Real estate activities	121 661.90	2 972.46	118 689.44
M - Professional, scientific and technical activities	98 091.79	1 746.32	96 345.47
N - Administrative and support service activities	12 093.88	1 986.40	10 107.48
O - Public administration and defence; compulsory social security	21 497.40	899.04	20 598.36
P - Education	810.54	104.16	706.38
Q - Human health and social work activities	154 566.21	3 741.29	150 824.92
R - Arts, entertainment and recreation	1 205.23	97.41	1 107.82
S – Other services activities	1 513.09	176.50	1 336.59
Unknown	23 257.48	6 619.45	16 638.03
Total	**6 920 535.12**	**371 553.28**	**6 548 981.86**

Source: SEA

♦ Waste handling

Waste recovery

There were 3 431 134.67 tons of waste recovered in the SR in 2012. This represents 50% of total volume of waste located on the market (not included MW). R3 activity – Recycling or reclamation of organic substances which are not used as solvents has the greatest share on waste recovery with a 21% share.

Waste recovery following codes R1 – R13 in year 2012 (t)

Code	Activity	Total (t)	Hazardous waste (t)	Other waste (t)
R01	Used mainly as fuel or to extract energy through different approach	111 486.61	4 256.77	107 229.84
R02	Solvent reclamation/regeneration	2 229.69	2 229.69	0.00
R03	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes)	725 561.73	1 044.11	726 605.84
R04	Recycling or reclamation of metals and metal compounds	684 321.71	6 396.96	677 924.75
R05	Recycling or reclamation of other inorganic material	478 030.00	8 393.49	469 636.51
R06	Regeneration of acids and bases	1 140.98	1 126.46	14.52
R07	Recovery of components used for pollution abatement	151.87	82.09	69.78
R08	Recovery of components from catalysers	2 573.66	2 573.58	0.08
R09	Oil re-refining or other re-uses of soil	12 944.97	12 622.10	322.87
R10	Treatment of soil to benefit the agricultural production or to improve environment	582 428.45	1 748.78	580 679.67
R11	Use of waste obtained from the activities R1 to R10	74 059.32	241.38	73 817.94
R12	Treatment of waste generated by any of the R1 to R11 activities	174 410.55	13 043.35	161 367.20
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).	580 795.13	19 765.59	561 029.54
Total		**3 431 134.67**	**73 524.35**	**3 358 698.54**

Source: SEA

Waste disposal

Of total volumes of generated waste placed on the market was disposed 3 342 470.32 t, what means 48% on total waste placed on the market (without MW). Dominance of landfill waste is a historical rule with and 81% share on total waste disposal. As of December 31, 2012, there were 118 landfills operated in Slovakia.

Number of landfills (towards 31.12.2012)

Region	Hazardous waste landfills	Landfills for not hazardous waste	Inert waste landfills	Total
Bratislava	2	7	2	11
Trnava	2	7	1	10
Trenčín	2	11	1	14
Nitra	3	14	2	19

Žilina	2	14	0	16
Banská Bystrica	2	13	1	16
Prešov	1	15	1	17
Košice	3	9	3	15
Total	**17**	**90**	**11**	**118**

Source: SEA

Waste disposal following codes D1 – D15 in year 2012 (t)

Code	Activity	Total (t)	Hazardous waste (t)	Other waste (t)
D01	Underground or surface waste disposal (e.g. landfill)	2 717 345.60	84 537.68	2 632 807.92
D02	Treatment by soil processes (e.g. biodegradation of liquid or sludge waste in soil, etc.)	132 613.08	49 586.91	83 026.17
D08	Biological treatment non-specified in this annex that generates compounds and mixtures eliminated by any of the D1 to D12 activities	255 231.49	42 967.84	212 263.65
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.)	99 538.22	77 105.48	22 432.74
D10	Incineration on land	67 469.27	20 354.78	47 114.49
D13	Mixing or blending prior to any of the D1 to D12 activities	4 869.99	363.36	4 506.63
D14	Placing into other packaging prior to any of the D1 to D12 activities	308.31	228.79	79.52
D15	Storage before implementing any of the D1 to D14 activities. (besides temporary storage prior to collection at the place of waste generation)	65 094.36	21 062.01	44 032.35
Total		**3 342 470.32**	**296 206.85**	**3 046 263.47**

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	32 777.07	0	32 777.07
Z	Storage of waste	114 153.10	1 822.10	112 331.00
Total		**146 930.17**	**1 822.10**	**145 108.07**

Source: SEA

♦ Waste from electrical and electronic equipment (WEEE)

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. Slovakia met this limit in 2012. Amount of collected WEEE was 22 671 tons.

Summary reports by producers of electrical equipment for the year 2012 (kg)

	Recovered		Recycled	
Category under Annex 3 of the waste law	**kg**	**%**	**kg**	**%**
1. Big domestic appliances	10 258 184.13	90.69	10 141 002.66	89.65
2. Small domestic appliances	1 710 559.19	85.75	1 646 333.97	82.53
3. IT and telecommunication devices	2 649 077.03	89.18	2 618 220.00	88.14
4. Consumer electronic devices	2 811 231.82	88.81	2 721 069.01	85.96
5. Sources of light	890 379.97	91.46	870 260.62	89.39
5a. Gass lamps	275 405.85	93.25	275 405.85	93.25
6. Electrical and electronic instruments	1 036 819.75	90.39	1 005 467.19	87.66
7. Toys, devices designated for sport and recreational use	176 606.36	83.06	169 827.77	79.87
8. Medical devices	124 193.17	85.83	123 173.66	85.12
9. Machines for monitoring and testing	115 663.30	88.31	114 168.33	87.17
10. Vending machines	213 072.41	91.41	210 980.50	90.51
Total	**20 261 192.98**	**89.73**	**19 895 909.56**	**88.12**

Source: SEA

Notwithstanding the reduction in the sale of electrical and electronic equipment in 2012 by almost 1.5% compared to 2011, Slovakia managed to comply with the obligation to collect and reclaim waste from electrical and electronic equipment. (WEEE) The obligation to collect and reclaim 21 724 tons of electrical and electronic waste was exceeded in Slovakia by 1.04%. In total, producers of electrical and electronic equipment who sell electrical equipment in 2012 collected 22 671 tons of WEEE and carried out processing of 22 579 tons of electrical and electronic waste which is approximately 46% of the number of electrical and electronic equipment introduced to the market in 2011. Slovakia today reaches the level of collection and processing of electrical and electronic waste set by the EU for the horizon following 2014. Slovak Ministry of Environment enforces the policy whereby individual producers are obliged to collect and process all electrical and electronic waste found in Slovakia.

In 2012, Slovakia complied with the limits for recovery and recycling of individual electrical and electronic waste categories set by the Regulation of the Slovak Government no. 206/2010 Coll.

♦ Polychlorinated biphenyls

Polychlorinated biphenyls (PCB) are synthetically prepared oily liquids. These compounds showing excellent technological properties were used in technology as fillings for transformers and as hydraulic liquids in condensers, hot-air media, additives to paints and plastic material, printing colors, glues, cements, as lubricants, burning inhibitors, etc.

Inventory of contaminated equipment (CE) with PCB contents is performed by the SAE, COHEM pursuant to Act 223/2001 Coll. on waste. The process of inventory is the result of reports by CE holders. Since the start of the inventory activities in 2001 until the end of 2012, 300 holders were

registered into the register. Total number of reported equipment with PCB contents is 49 197 pieces. By the end of 2012, the information PCB system still showed 5 522 units of CE with their holders no having complied with the provisions of the quoted law regarding the obligation to eliminate this equipment before December 31, 2010.

Results of the inventory of contaminated equipment (CE) as of December 31, 2012

Number of CE in the IS - KZ (pcs)		
Total numbers	**Functional**	**Eliminated**
49 197	5 522	43 675

Contaminated installations (%)	
Functional	**Eliminated**
11%	89%

Source: SEA

Results of the inventory as of December 31, 2012 clearly show that the register still shows 11% of total number of reported CE. A number of them still contain PCB in the volume below 5 dm^3, however, pursuant to Council Directive 96/59/EC on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT), in the case of power condensers the limit of 5 dm^3 shall be understood as the sum of separate volumes of the combined instrument. Holders of this equipment act contrary to the national and European legislation.

List of holders with CE still in operation: "List of holders of contaminated equipment containing PCB" can be found at http://www.sazp.sk/public/index/go.php?id=2098&lang=sk

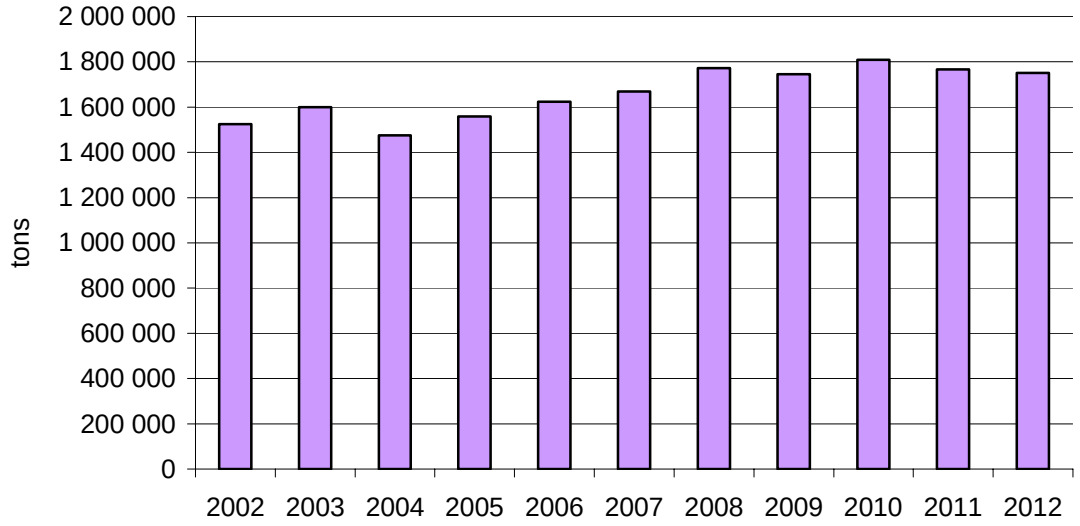
♦ Old vehicle

When compared with 2011 (39 171 pcs of old vehicle) there was in 2012 (33 469 pcs) reduction about 14.5% in the number of handled old vehicles.

♦ Municipal waste

According to data from the SO SR, there were 1 747 569.05 tons of total municipal waste generated in Slovakia in 2012. This volume represents 323 kg of municipal waste per capita. Compared to 2011, this is an increase by 4 kg per capita. Long-term waste disposal on landfills 74.18% is the most frequent method of municipal waste handling, following by incineration with energy recovery (6%).

Municipal waste generation (1000 tons)



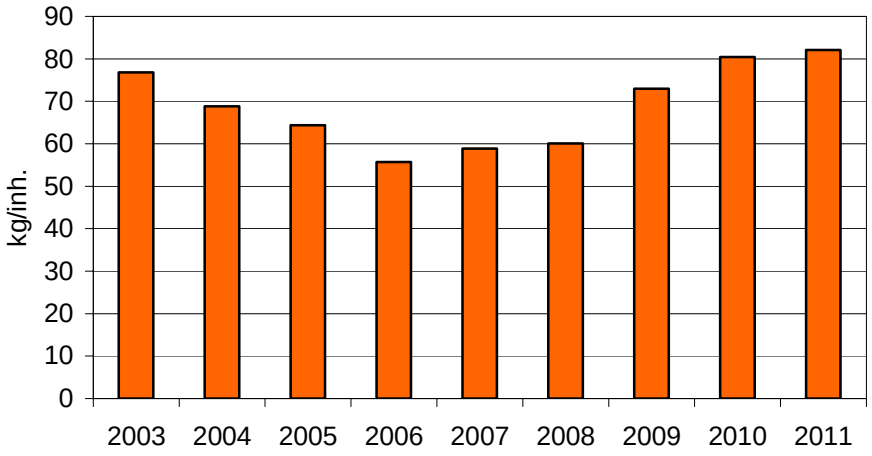
Source: SO SR

In terms of municipal waste composition, mixed municipal waste (67.35%) constitutes the major component of municipal waste together with bulky waste (9.83%), biologically degradable waste was 5.48 %, small construction waste (5.39%) and waste paper and cardboard was 3.37% and glass 2.78%.

♦ 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 to 62.4% in 2012.

Trend in packaging waste generation (kg/inh.)



Source: Eurostat

♦ Financial mechanism of waste management

Recycling Fund

Total revenues into the fund from the contributions for the monitored commodities in 2012 represented more than 12.14 mil. EUR. Contributions for the commodity of "cars" amounting to more than 9.4 mil. EUR showed the highest share within the Recycling Fund. Successful applicants in 2012 together received more than 10.15 mil. EUR from the fund. This sum may include also the funds approved in the previous years but paid as late as in 2012.

♦ Transboundary movement

In 2012 was permitted to be imported into Slovakia 270 300 tonnes of waste classified under 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 and 301 809.5 tonnes of waste was permitted for export. On the basis of licences issued by the MoE SR, for transit shipment in 2012, 93 138 tonnes of waste was licensed for transit through the Slovak territory.

Total amount of transported and imported waste in 2012 (t)

Country	Import (t)	Export (t)
Belgium	-	1 000
Bulgaria	-	8 000
Czech republic	2 500	28 180.5
Holland	-	1 000
Hungary	8 000	-
Germany	8 000	1 769
Poland	-	204 270
Austria	178 000	7 500
Slovenia	14 000	-
Serbia	-	50 000
Italy	59 800	-
Great Britain	-	90
Total	**270 300**	**301 809.5**

Source: SEA

• CLIMATE CHANGES

Key questions and key findings

What is the trend in the greenhouse gases emissions in Slovakia?

- **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 have been permanently declining. (when the figures for 2011 are compared to 1990, there is a 36.9% reduction) However, it must be said that during the years 1996-2008, emissions showed roughly the same values. Following the years of 2008 and 2009 affected by the recession, there was a slight increase in emissions, spurred by the reviving economy. Between years, (2010-2011) greenhouse gases emissions experienced a decline by 1.3%.**

What is the observable impact of climate changes in the Slovak territory?

- **Change in climate has been most noticeable in the change to air temperatures. Rise in air temperature is definite. Average annual air temperature over the years 1981-2010 at Hurbanovo reached 10.6°C, which is 0.7°C more than in 1951-1980.**
- **Over the last twenty years the rising air temperature has been most prominent. 8 out of 10 warmest years since 1871 at the Hurbanovo station in terms of the average annual air temperature fall into this time period. The following years were included: 1992, 1994, 2000, 2002, 2003, 2007, 2008, 2009.**
- **There was also a declining trend in total annual atmospheric precipitations, relative air humidity, and snowcap 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 has been 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, much more often than before there would occur local or large-scale droughts caused mostly by prolonged periods of relatively warm weather with little rainfall totals during a particular part of the vegetation period. Especially harmful were droughts in the periods of 1990-1994, 2000, 2003, 2011, and 2012.**
- **Reactions of flora and fauna are the practical consequence of the trend in the climate system. Within the phenological phases i.e. expressions of the life cycle of plants and animals, certain destabilising tendencies were noticed. These tendencies may relate also to the complex natural conditions that exist in Slovakia. Noticeable also are changes in the distribution areas of animals and in the changes of their behaviour.**

Balance of greenhouse gases emissions

Total anthropogenic greenhouse gases emissions in 2001 were 45 294 620 tons (expressed as CO_2 equivalents).

Compared to 1990, total emissions **declined** by 36.9% and compared to 2010 they declined by 1.3%. Following a significant decline in 2009 due to the economic crisis, the trend in total

anthropogenic emissions for the years 2010 and 2011 has remained relatively stable and the emissions still have not reached the level from before 2009.

After a significant reduction in emissions after 1990 due to declining economic performance, Slovakia was able to maintain the trend in reducing the carbon intensity also after 1997, e.g. during the period of revived economic growth. While the country was able to maintain the so-called "decoupling" e.g. slower growth in emissions compared to the GDP growth dynamics.

Road transport is a significant sector where Slovakia has not been able to stabilise the growth in greenhouse gases emissions. Share of emissions within the sector of **power industry,** including transport, in total greenhouse gases emissions in 2011 was almost 70% (expressed in CO equivalents), with the emissions from transport within power industry generating 20%. While the share of emissions from stationary sources declines, share of emissions from transport still continues to grow. Since 1950, emissions from transport have grown by 27% and in 1990 reached only 9%. Another area where the greenhouse gases emissions have yet been effectively regulated is **burning fossil fuels in households**, so-called local heating places.

The sector of **industrial processes** is the second most significant sector with 18.2% share in total greenhouse gases emissions in 2011.

The sector of **agriculture** in 2011 contributed with 6.9% to total greenhouse gases emissions. Emissions within this sector declined sharply as early as after 1990. Since 2000, their trend has remained stable and affected only by prices and subsidies of agricultural commodities. More significant decline in the nineties was caused mainly as a consequence of total reduction in the consumption of nitrogen fertilisers and reduction in the volume of livestock. Improvements in agricultural practices together with the introduction of ecological farming create further conditions for positive trend in emissions within this sector also for the years to come.

The sector of **waste** in 2011 contributed with almost 5% to total greenhouse gases emissions. After the introduction of methodology for determining the methane emissions from municipal waste landfills, more exact data were obtained, which resulted in the increase of emissions estimates for this category.

The sector of **using solvents** is less significant and contributed to total greenhouse gases emissions in 2011 only by less than 1%. Emissions in this sector are produced mainly in cleaning facilities, car paint shops and the industries using volatile organic substances.

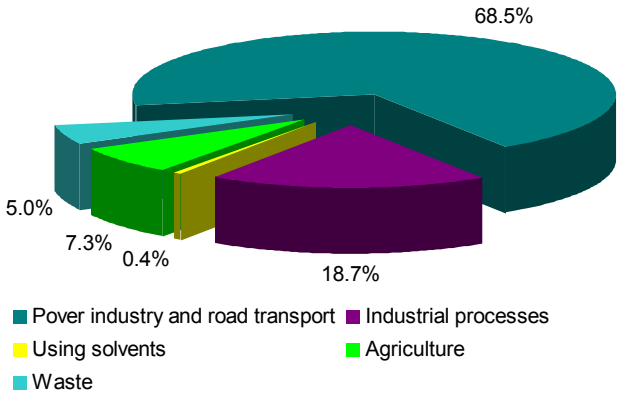
Share of individual sectors in total greenhouse gases emissions in 2011 has not differed much since the separation in 1990.

Aggregated emissions of greenhouse gases (Tg) in CO_2 equivalents

Year	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Net CO_2	59.61	30.57	33.61	31.60	32.55	33.06	36.07	33.22	31.72	33.24	28.32	30.96	30.16
CO_2*	60.75	41.37	44.17	42.41	42.84	42.74	42.22	41.72	39.86	40.49	35.80	37.91	37.67
CH_4	4.41	4.25	4.29	4.90	4.73	4.60	4.36	4.44	4.36	4.38	4.20	4.11	4.14
N_2O	6.35	3.58	3.76	3.74	3.79	3.81	3.77	4.04	3.97	3.85	3.54	3.42	3.01
HFCs	NA, NO	0.08	0.10	0.13	0.15	0.18	0.21	0.25	0.28	0.34	0.38	0.42	0.44
PFCs	0.27	0.01	0.02	0.01	0.02	0.02	0.02	0.04	0.02	0.04	0.02	0.02	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	0.02	0.02
Total (with net CO_2)	**61.76**	**38.58**	**41.85**	**40.44**	**41.31**	**41.74**	**44.49**	**42.04**	**40.42**	**41.90**	**36.52**	**38.98**	**37.83**
Total*	**71.78**	**49.30**	**52.36**	**51.21**	**51.54**	**51.38**	**50.60**	**50.50**	**48.52**	**49.11**	**43.96**	**45.90**	**45.30**

Emission were assessed by 15.04.2013 Source: SHMI
The table shows calculated years 1990-2010
** 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 in 2011



Emission were assessed by 15.04.2013 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	2010	2011
Power Industry*	53.86	35.65	38.13	35.85	36.52	35.44	35.50	34.43	32.75	33.55	30.20	31.79	31.53
Industry Processes**	9.54	8.29	8.77	9.15	9.02	10.13	9.41	10.25	10.01	9.90	8.37	8.62	8.25
Using solvents	0.15	0.09	0.10	0.13	0.14	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.17
Agriculture	7.12	3.50	3.54	3.48	3.36	3.17	3.17	3.12	3.23	3.13	3.05	3.10	3.12
LULUCF	-10.02	-10.71	-10.51	-10.77	-10.24	-9.63	-6.10	-8.46	-8.10	-7.22	-7.44	-6.92	-7.47
Waste	1.09	1.78	1.81	2.58	2.50	2.47	2.35	2.53	2.36	2.37	2.16	2.22	2.23

Emission were assessed by 15.04.2013 Source: SHMI
The table shows calculated years 1990-2010
** Including the traffic ** Including the F-gases*

International obligations in the area of climate changes

At the UN Conference on Environment and Development (Rio de Janeiro, 1992) was adopted **framework UN Framework Convention on climate change** – basic international legal instrument for

protection of global climate. The Convention became effective in Slovakia on March 21, 1994. Slovak Republic accepted all the obligations of the Convention ratified by 183 countries and the EU as to date.

The Kyoto Protocol (KP) was adopted at the COP - Conference of Parties in December 1997. Slovakia along with other EU countries (EU obligation was assumed as a joint obligation, the so-called burden sharing agreement) approved a reduction target for the period of 2008-2012 not to exceed the average level of greenhouse gases emissions of 1990 reduced by 8%.

In the spring of 2007, the European Parliament adopted a unilateral obligation to reduce the greenhouse gases emissions within the EU by at least 20% by 2020, compared to 1990. Next, there was a declaration that the EU will extend this obligation to a 30% reduction provided that such is adopted also by other world developed countries and that developing countries with more advanced economies will follow, assuming obligations adequate to their responsibility and capacities.

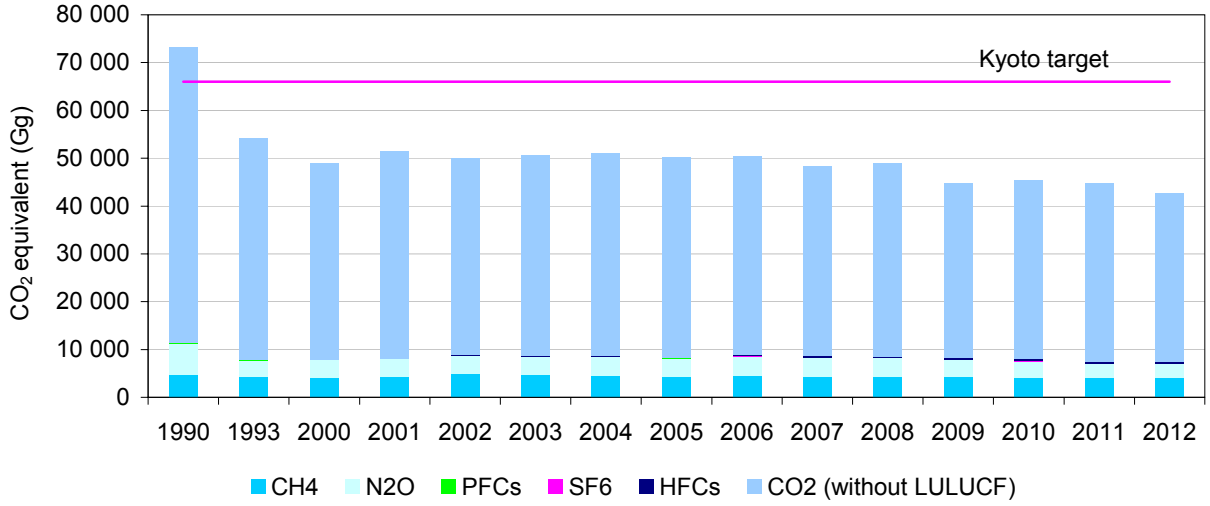
The integrated climate-energy package officially presented by the European Commission in January 2008 is a basic, complex and very ambitious approach to reduce greenhouse gasses emissions, increase the energy efficiency, reduce the consumption of fossil fuels, and support innovative, low-carbon technologies.

Slovakia has been meeting the mentioned international obligations and expects to do so in the years to come.

Trading with the emission allowance as mentioned in article 17 of the Kyoto Protocol constitutes one of the flexible mechanisms how to achieve the Protocol's objectives. The EU has undertaken to adopt, beyond the scope of the international trade with the emission allowance limits, its own instrument through which it sets its own rules.

Adopting the European Parliament and of the Council Directive 2003/87/EC of October 13, 2003 establishing the scheme for greenhouse gas emission allowance trading within the Community gave rise to the legal framework for the function of EU ETS.

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



Source: SHMI

Trend in the selected climate change assessment indicators

Trend in the development of the climate has been assessed on the basis of trends that exist within large-scale time sequences (1951-2012) for individual climate elements, and on the basis of a comparison of individual years to the normal reference period of 1961-1990. Beside the climate elements, assessed are also the selected hydrological flow characteristics that immediately react to the trends in climate development. (i.e. atmospheric precipitations, air and vapour temperature) Two monitoring stations were selected for the purposes of carrying out a representative assessment of indicators in relation to Slovakia's altitude. The station of Hurbanovo is to provide data for the lowland-type areas, and the stations of Liptovský Hrádok or Oravská Lesná will gather data from the areas of higher altitude.

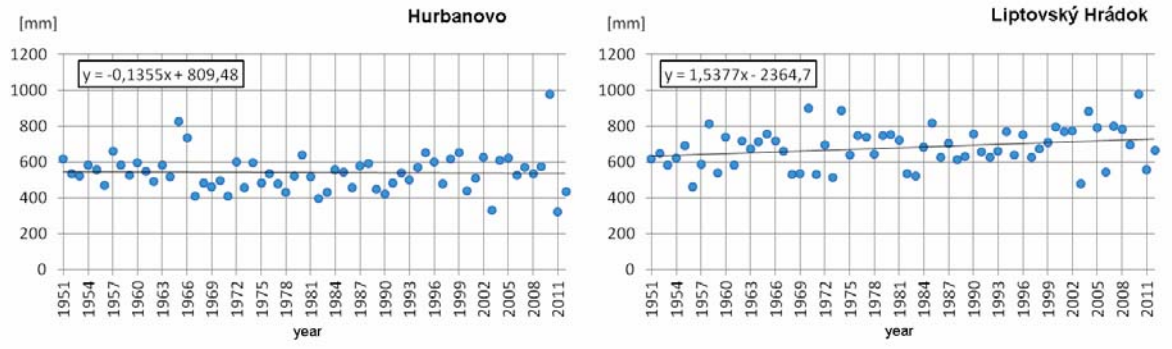
♦ Climate elements

Total annual atmospheric precipitations (1951 - 2012)

The lowland areas of Slovakia showed a **declining trend** of total annual precipitations over the years 1951-2012 (8 mm at Hurbanovo), while the trend was rising in the northern and high-altitude areas. (94 mm at Liptovský Hrádok)

Significant below-the-limit years assessed at the Hurbanovo station on the basis of the annual total precipitations within the interval below 10% of occurrence compared to the normal level included the following years: 1967, 1971, 1978, 1982, 1990, 2003 and 2011and at the Liptovský Hrádok station: 1956, 1968 - 1969, 1973, 1983 and 2003. On the contrary, **significantly humid years** with the annual total precipitations above 90% compared to the normal values recorded at Hurbanovo included the years 1957, 1965-1966, 1980, 1995, 1999, 2010, and in 1958, 1970, 1974, 1985, 2004, 2007, 2010 at Liptovský Hrádok.

Total annual atmospheric precipitations in Hurbanovo and Liptovský Hrádok (1951-2012)



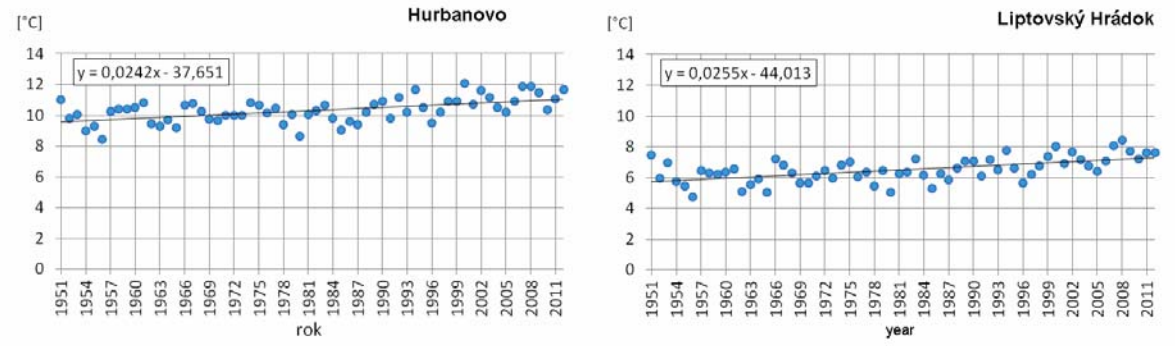
Source: SHMI

Average annual air temperature (1951-2012)

Both, lowland and highland areas show a **rising trend** in the average annual air temperature. (1.5°C at Hurbanovo, and 1.6°C at Liptovský Hrádok)

Significantly **below normal temperatures** recorded at Hurbanovo were the years 1954-1956, 1963, 1965, 1980, 1985, and 1955-1956, 1962, 1965, 1978, 1980, 1985 at Liptovský Hrádok. Significantly **above normal temperatures** recorded at Hurbanovo were the years 1994, 2000, 2002, 2007-2009, 2012 and in 1994, 2000, 2002, 2007-2009, 2011 at Liptovský Hrádok.

Average annual air temperature in Hurbanovo and Liptovský Hrádok (1951-2012)



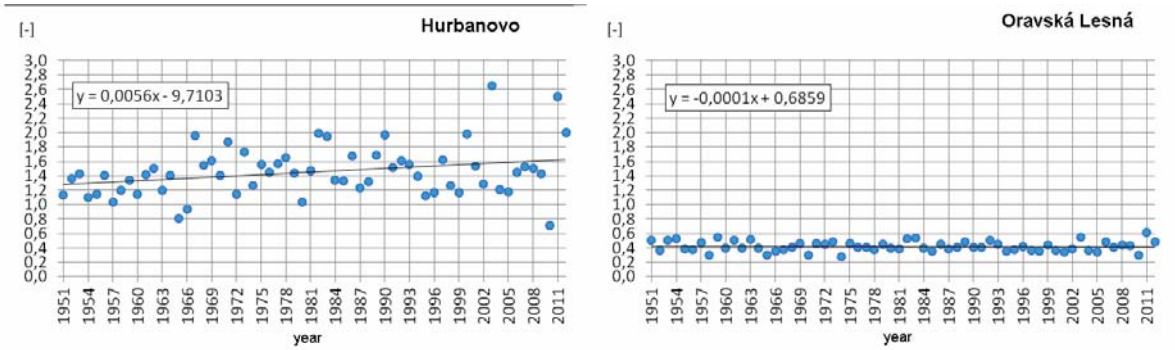
Source: SHMI

Drought index (1951-2012)

Drought index is based on the comparison (ratio) of the annual sum of potential evapo-transpiration and the total annual atmospheric precipitations. The lowlands of Slovakia recorded a rising trend in the drought index (0.34 at Hurbanovo), while in the highland areas this index shows practically zero trend. (0.01 at Oravská Lesná)

Statistically **significant drought** occurred especially in the southern parts of Slovakia (Hurbanovo) in the years 1967, 1982, 1990, 2000 and 2011-2012. On the contrary, **very humid years** detected at Hurbanovo included the year 1954, 1957, 1965-1966, 1980, 1995 and 2010 while the far northern part of the territory did not record any significant dry seasons.

Drought index in Hurbanovo and Oravskaá Lesná (1951-2012)



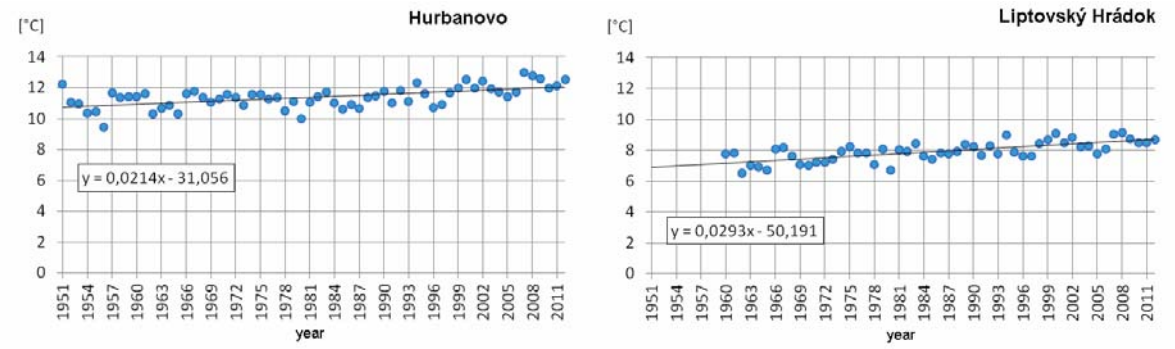
Source: SHMI

Annual soil temperature in the depth of 10 cm (1951-2012)

Both, lowland and highland areas show a **rising trend** in the average annual soil temperature in the depth of 10 cm (1.3°C at Hurbanovo, and 1.8°C at Liptovský Hrádok).

Statistically **above-normal years** in annual soil temperature in the depth of 10 cm at Hurbanovo were 1994, 2000, 2002, 2007-2009, 2012 and at Liptovsky Hrádok 1994, 2000, 2002, 2007-2009.

Annual soil temperature in the depth of 10 cm in Hurbanovo and Liptovský Hrádok (1951-2012)



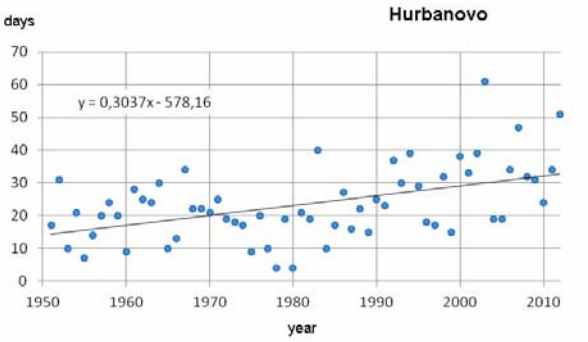
Source: SHMI

Heat waves (number of tropical days) (1951-2012)

Both, lowland and highland areas show a rising trend in the number of tropical days. (19 more at Hurbanovo and 8 more at Liptovský Hrádok)

Strong, **above-normal number** of tropical days occurred at Hurbanovo in 1983, 1994, 2000, 2002-2003, 2007, 2012, and in 1992, 1994, 1998, 2006-2007, 2010 and 2012 at Liptovský Hrádok. On the contrary, strong **below-normal number** of tropical days was recorded at Hurbanovo in 1953, 1955, 1960, 1965, 1975, 1977-1978, 1980, 1984 and at Liptovský Hrádok in 1953, 1955-1956, 1960, 1966, 1970, 1973, 1975, 1977-1980, 1982, 1985-1986 and 2008.

Number of tropical days in Hurbanovo (1951-2012)



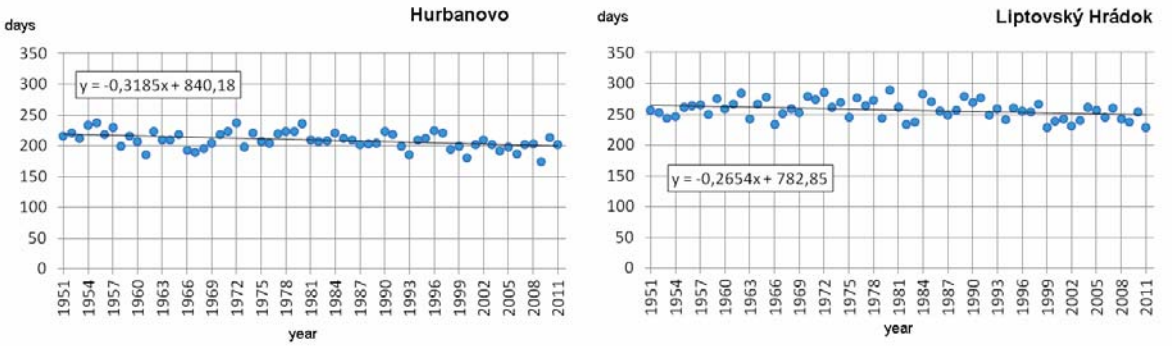
Source: SHMI

Heating period of 1951-2012

Lowland as well as highland areas show a declining trend in the **number of heating days,** specifically by 20 days less at Hurbanovo, and 17 days at Liptovský Hrádok.

Statistically significant **low number of heating days** was recorded at Hurbanovo in the years 1961, 1967, 1993, 2000, 2004, 2006, 2009 and in 1966, 1982-1983, 1999, 2002, 2009 and 2011-2012 at Liptovský Hrádok. On the contrary, statistically strong **high number** of these days was recorded at Hurbanovo in 1954-1955, 1957, 1972, 1980, 1996 and at Liptovský Hrádok in 1962, 1965, 1970, 1972, 1980, 1984 and 1989.

Number of heating days in Hurbanovo and Liptovský Hrádok (1951-2012)



Source: SHMI

♦ Hydrological elements

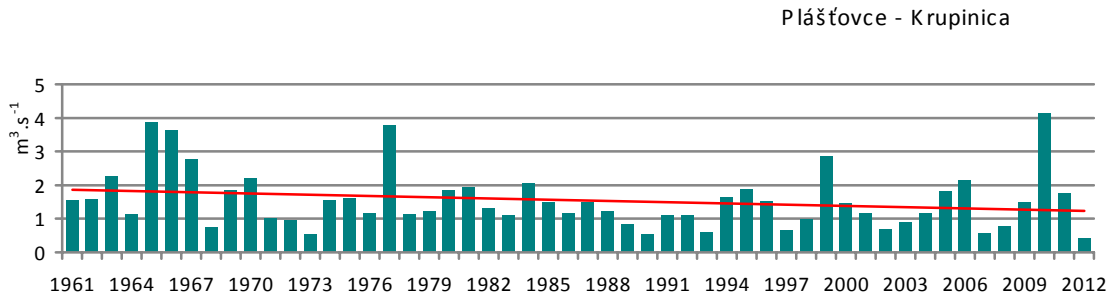
Annual flows

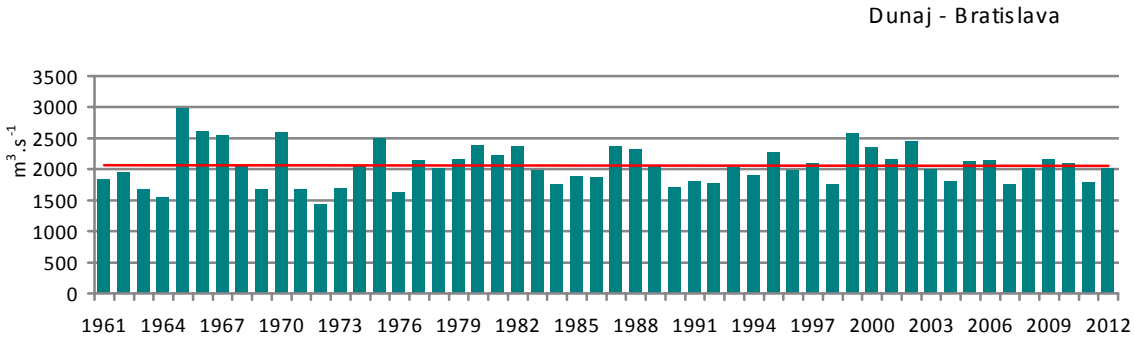
Watershed area of the southern part of Slovakia (Slovakian part of the Morava river watershed along with the watersheds of Nitra, Hron, Ipeľ, Slaná, and Bodva) show slight to significant decreasing trend in **average annual flows** for all monitored periods. (e.g. Krupina in Plášťovce) Watershed areas of the north-western, northern, and north-eastern Slovakia show, over the entired monitored period, very slightly declining, balanced, or even slightly rising trend in average annual flows for all monitored periods. (e.g. Kysuca in Čadca). Notwithstanding the legth of the period, introduced water course of Danube has shown a balanced characteristics in average annual flows.

Trends in **minimum annual flows** essentially copy the trends in average annual flows in southern and northern watersheds of Slovakia. (e.g. Krupina in Plášťovce) Minimum annual flows recorded on Danube in Bratislava show a slightly rising trend.

Unlike the average annual flows, the trend in **maximum annual flows** provides no sufficient basis to **define similar areas.** Surprisingly, most monitored watercourses over the last decades show declining or balanced trend in maximum annual flows. (e.g. Krupina in Plášťovce). Trend in maximum annual flows on Danube in Bratislava for the period beginning at the start of the last century as well as since the start of monitoring in 1961, has been rising significantly.

Average annual flows (1961-2012)





Source: SHMI

♦ Run-off distribution over the year

No significant changes in run-off distribution over the long-term horizon have been detected in Slovakia for selected time periods.

• PUBLIC HEALTH

Key questions and key findings

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

- **The average life expectancy at birth in Slovakia has been permanently rising. In the course of the years 1993-2012, the average life expectancy at birth grew by 4.12 years in men and 2.79 years in women. In 2012, compared to 2000, it grew by 3.33 years in men, and by 2.23 years in women. Over the last year, the average lie expectancy at birth grew by 0.30 years in men, and 0.10 years in women**
- **The number of live births per 1 000 inhabitants grew from the level of 13.96 pro mile in 1993 to 10.27 pro mile in 2012. In the middle-term perspective, the number of live births also grew from 10.21 pro mile in 2000. The last year-to-year change in the number of live births reached the value of 1 pro mile.**
- **Number of deaths per 1 000 inhabitants dropped from the level of 9.9 in 2000 to 9.8 in 2010. Trend in the number of deaths per 1,000 inhabitants remains balanced over a long period of time. Over the period of 1993-2012, this trend declined from the level of 9.9 pro mile to 9.70 pro mile, while in the period between the years 2011-2012 it declined only by 0.08 pro mile.**

Morbidity and mortality

Average life expectancy at birth is rising for both genders, reaching 72.47 years for men and 79.45 years for women in 2012. 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.

In 2012, there were 26 884 deaths for men and 25 553 deaths for women. Compared to 2011, this is higher by 87 deaths in men, and higher by 446 deaths in women. In 2012, men comprised 51.3% of deaths, while women 48.7%.

Greatest public mortality both in men and women over a long time period has been from **circulatory system diseases** in 2012, with 27 773 deaths, which is 44.7% in men and 55.3% 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 12 197 deaths in 2012, which is 25.8% of men and 20.6% of women. For men, third most frequent cause of death is **external causes** (7.7%). For women, third most frequent cause of death are **other diseases** (6.7%).

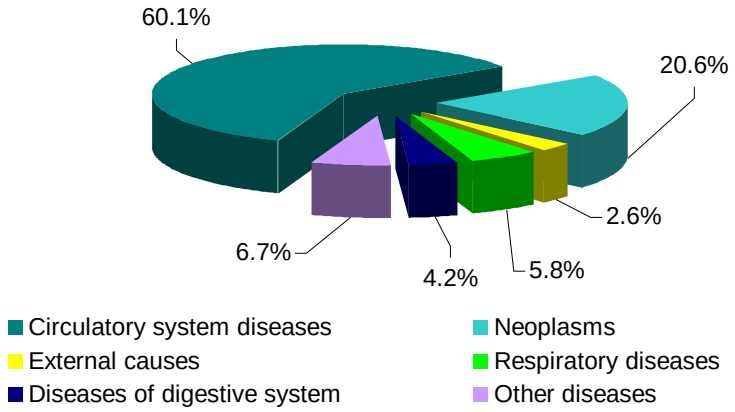
Public Health – selected indicators

Indicator	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Life expectancy at birth												72.47
• Men	69.51	69.77	69.77	70.29	70.11	70.40	70.51	70.85	71.27	71.62	72.17	79.45
• Women	77.54	77.57	77.62	77.80	77.90	78.20	78.08	78.73	78.74	78.84	79.36	
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	11.3	10.3
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	4.9	5.8
Infant mortality rates	4.1	4.7	4.5	3.9	4.1	3.5	3.4	3.4	3.1	3.6	2.9	3.3
Deaths	51 980	51 532	52 230	51 852	53 475	53 301	53 856	53 164	52 913	53 445	51 903	52 437
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	9.6	9.7

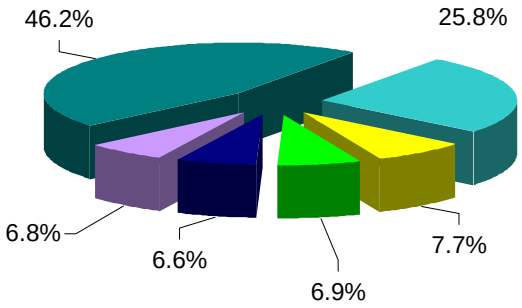
Source: SO SR

Structure of causes of death in SR in 2012

females



males



Source: SO SR

ENVIRONMENTAL RISK FACTORS

• PHYSICAL RISK FACTORS

Key questions and key findings

How significant is the load effecting the population due to the contents of artificial radionuclide agents in the food chain components?

- **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.**

Is the operation of nuclear power plants in Slovakia safe?

- **Similarly, even the special tests of nuclear facilities following the Japan accident of 2011 confirmed that nuclear power plants in Slovakia represent a safe option and are able to handle even exceptionally extreme events.**

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 2012, total number of 766 samples from the environment was extracted and 1 036 radiochemical analyses were conducted, along with 6 550 radiometric measurements.

Basic radiology indicators found in the samples of drinking water abstracted within the environmental monitoring did not exceed the reference values for implementation of measures under Annex 4 to Decree 528/2007 Coll. ^{90}Sr volume activities were at 0.005 Bq/l and less than 0.015 Bq/l for ^{137}Cs.

Surface and wastewater showed the maximum activity of 0.020 Bq/l for ^{90}Sr, and 0.066 Bq/l for ^{137}Cs.

Volume activities of tritium within drinking water samples and atmospheric precipitations stayed at the MDA level (1.9 Bq/l), and in the interval of up to MDA – 126,0 Bq/l for surface water. Highest tritium activities were recorded in the wastewater from NPP Mochovce (maximum value of 4 200.0 Bq/l). No exceeded values for the concentration limit $1.95.10^5$ Bq/l were detected in tritium discharged into the environment.

The highest ^{90}Sr activity in atmospheric fallout was 1.11 Bq/m^2 (quarterly) and 5.56 Bq/m^2 for ^{137}Cs.

Activity of nuclear installation

Nuclear facilities in Slovakia are operated under strict safety regulations, technical and environmental norms, public health and environmental protection standards.

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 Interim Spent Nuclear Fuel Storage The Bohunice RAW Treatment Centre	**JAVYS, Inc.**
Mochovce	Liquid RAW Final Treatment Facility National Radioactive Waste Repository	

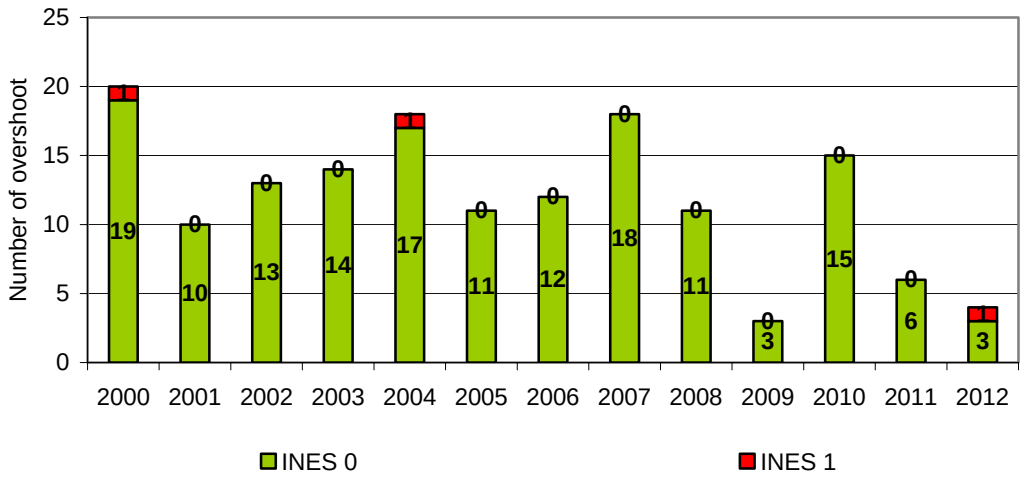
Source: NRA SR

Nuclear power plant of Bohunice V-2

The Bohunice V-2 nuclear power plant (NPP) comprises 2 nuclear blocks of the VVER 440/213 type. Since 2012, both blocks have been operated at increased thermal (1 471 MWt) and electric (505 MWe) reactor outputs. Besides, they are located at the site of NPP Bohunice V-1 and NPP Bohunice A-1 that are phased-out. In 2012, besides standard control and assessment activities related to everyday operations of power plants, the most significant activity in terms of nuclear safety was the ongoing project of implementing measures to mitigate the aftermath of so-called grave accidents.

The number and character of events under the International Nuclear Events Scale (INES) in 2012 was within the range of common technical malfunctions, without any major safety issues. Events that occurred at the power plant did not have a major impact on nuclear safety. Nuclear Regulatory Authority of the SR (NRA SR) assessed the operation of both NPP V-2 blocks in 2012 as reliable, with no major failures in the area of nuclear safety.

Number of occurances of block NPP Bohunice V-2



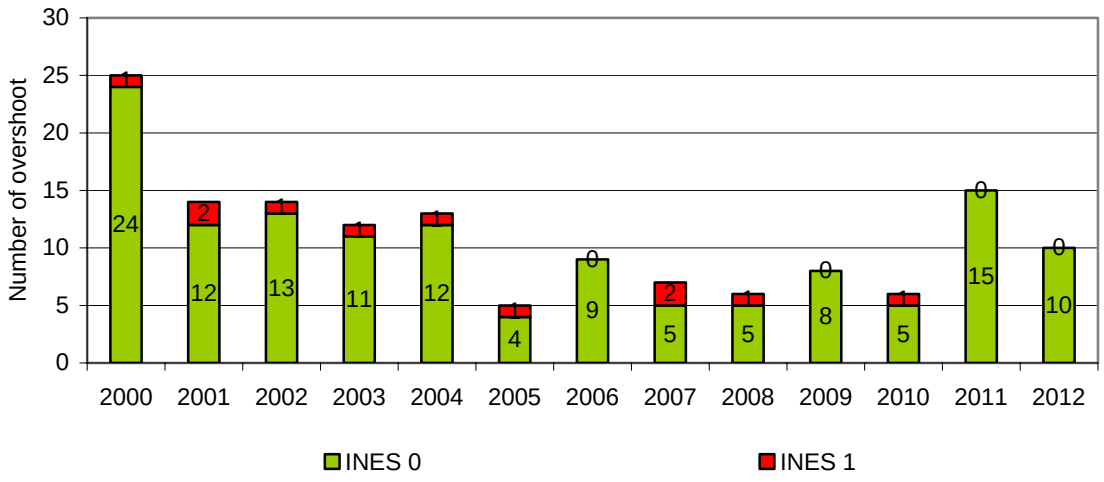
Source: NRA SR

Nuclear power plant of Mochovce 1, 2

The NPP Mochovce comprises two blocks with the VVER 440-type reactors of the nominal output of 470 MWe. Other two blocks, VVER 440/213, of this substantially improved project are under construction (3rd and 4th block of the NPP Mochovce). In 2012, both blocks of 1 and 2 NPP Mochovce met the demands of the Slovak energy control centre.

The number and character of events and occurrences in 2012 was within the realm of common technological malfunctions and did not require special attention in terms of unique safety issues.

Number of occurances of block NPP Mochovce 1, 2



Source: NRA SR

Interim Spent Nuclear Fuel Storage (ISFS) of Jaslovské Bohunice

MSVP found at the Bohunice site serves for temporary storage of spent fuel from the Bohunice V-2, Mochovce 1 and 2, and Bohunice V-1 nuclear power plants.

The facility comprises two bitumenization lines, cement line of the Bohunice RAW processing centre, fragmentation line, large-capacity decontamination line, site for the treatment of used air-conditioning filters, and RAW storage capacities.

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

It 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 in Mochovce (NRWR)

Designated for the final storage of solid and reinforced low and medium active RAW. In 2011, the ÚJD SR issued a decision permitting the operation of RÚ RAO for the next 10 years.

Liquid RAW Final Treatment Facility in Mochovce (LRW FTF)

This facility treats liquid RAW from the operation of the nuclear power plant of Mochovce and processes it into a form suitable to be stored at RÚ RAO. 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.

In response to the accident at NPP Fukushima (March 2011) in Japan, top representatives of the EC and the member states agreed to perform on-target assessment of the security risks (so-called stress testing) at NPP in the EU member states. Thorough inspections of nuclear facility safety were implemented in also in Slovakia. A number of non-standard tests and in-depth inspections to identify the areas for possible increase of nuclear power plants' resistance were carried out under the stress testing implemented at nuclear power plants.

• CHEMICAL RISK FACTORS

Key questions and key findings

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

- **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.

53 081 samples were extracted over the entire monitored period (22 years), containing **3 042** limit-exceeding samples, which represents **5.7%**. **In 2012**, **395 samples** analysed for the content of chemical substances, nitrates and nitrites were extracted from 202 hunts and 37 agricultural enterprises. Monitoring was carried out for 30 agricultural subjects, analyzing soil samples from 9 485

ha, including the crop produced from this soil. Samples with limit-exceeding values in 2012 have been detected in feeding water, especially for nitrates (2 samples). In other commodities, no limit-exceeding samples were found in 2012 (soil, forage, feedstock).

♦ 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 **twenty years, 12 947 samples** were analysed, including **517 samples**, i.e. **4.0%** that exceeded permitted limit values, especially in nitrates and chemical elements.

21 basic food items and drinking water (abstracted since 2007) are sampled for the consumption basket. 256 samples were analysed in 2012. Of these, 1 sample (dioxines) extracted from beef did not comply with the set limits (chain of stores in Moldava nad Bodvou).

♦ 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 1995, in total, there have been analysed **4 001 samples** of fish, game, mushrooms, forest products, as well as feeding water and sediments from water formations. The set limits were exceeded by **18.9%**; 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 2012**, there were **134 samples** abstracted, of which **8.96%** exceeded the limit, just like in the previous time period, exceeded were the limits for PCB in fish from 7 regions of Slovakia (Trebišov, Košice, Michalovce, Prievidza, Banská Bystrica, Martin and Prešov).

• ENVIRONMENTAL LOADS

Key questions and key findings

What is the documented scope of environmental loads?

- **As of the end of 2012, the total of 905 probable environmental loads was recorded in Slovakia, and 260 existing environmental loads.**

Present situation in the area of environmental loads and its solutions

Methodological Order no. 1/2012 of January 27, 2012 on the elaboration of risk analysis of the contaminated area came into effect in 2012 together with the published **Methodological guidance accompanying the schedule of works pursuant to Act 409/2011 Coll. on certain measures in the area of environmental load as amended** (of December 20, 2012).

A call to the **priority axis 4, target 4.4.** was ended on 10/02/2012 within the **Operation programme of Environment (OPE). : Addressing the issue of environmental loads and their elimination.** This call´s objective was to implement **EL survey, EL monitoring, involving the public, and promotion.**

Ministry of Environment of the Slovak Republic and its contributory or budgetary organisations were designated as the recipients of the assistance. Total allocated funds were set at 18 mil. Eur.

The following projects were submitted as part of the on-going call:

- Survey of environmental loads at selected sites of the Slovak Republic (2012-2013) submitted by: Ministry of Environment of SR
- Monitoring of environmental loads at selected sites of the Slovak Republic (2012-2015) submitted by: SGI DS
- Promotion, involving the public as a support to solving the environmental pressures (2012-2015) submitted by: SEA

All of the above-mentioned projects were launched in the Fall of 2012.

Works on the project of **Completion of the Information System of Environmental Pressures,** 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 2012, the information system of environmental loads contained **905 probable and 260 existing environmental loads, and 726 remedied and recultivated sites.**

• NATURAL AND TECHNOLOGICAL HAZARDS

Key questions and key findings

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

- **Number of events of extraordinary deterioration of water quality (EDW) showed fluctuating characteristics with 2 388 events over the monitored period of 1993-2012. In the period of 2000-2012, the least number of reported EDW occurred in 2001 (71), and most in 2003 (176). In 2012 there was a slight increase compared to the previous year.**
- **65 events of extraordinary deteriorations of air quality were detected in the period of 1993-2007. Over the last five years the Slovak Environmental Inspection Authority (SEI) has not detected any event leading to deteriorated air quality.**
- **In the period of 1993-2012, 216 800 fires were reported in Slovakia. The number of casualties over this period was 1 096, with 3 819 injured persons. In the period of 2000 - 2012, fires showed fluctuating characteristics and in none of these years the number dropped below 8 000. In 2012, there was a small increase compared to the previous year with the numbers copying those in 2007.**

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

- **Total direct damage caused by fires in 2012 increased compared to the previous year. The extent of damage over the period of 1993-2012 reached the value of 551.129 mil. Eur with the most extensive damage detected in 2012 (69.148 mil. Eur). In the period of 2000-2012, the extent of damage caused by fires did not drop below 15.000 mil. Eur.**
- **Total costs and the damage relating to the floods of 2012 reached 3.27 mil. Eur, which is approximately the value recorded in 2007. Over the monitored period of 1998-2012, total costs and damage amounted to 1 111.2 mil. Eur with the least damage caused in 2003. The most devastating floods were reported in 2010.**

Accidental deterioration of water quality

In 2012, the Slovak State Environmental Inspection statistics showed sligt increase in the number of events and recorded 117 emergency deteriorations or threats to water quality (EDW). Of all recorded events, 67 were cases relating to surface water, and 50 were cases of threats or contamination of ground water.

Special declination or quality menace of water of the SR in the years 1993, 2000-2012

Year	EDW recorded by SEI	Special deterioration of water					
		Surface			Ground		
		Total number	Watercourses and basins	Water courses	Total number	Pollution	Endanger-ment
1993	142	95	3	12	47	10	37
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
2011	115	59	2	5	56	1	55
2012	117	67	0	7	50	2	48

Source: SEI

Compared to the previous year, the number of EDW caused by crude oil compounds and other compounds declined, with wastewater and other toxic substances staying at the level of last year. Caustic substances, insoluble substances, and the excrements of livestock caused increase in the number of EDW. In fourteen cases it was impossible to detect the type of the harmful or very harmful agent.

Progress in number of EDW according to the sort of WDS in the years 1993, 2000–2012

Sorts of water deteriorative Substances (WDS)	1993	2000	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Oil substances	70	33	64	59	70	63	69	76	65	65	60	76	66
Alkalis	5	2	5	3	1	0	3	4	2	0	3	0	1
Pesticides	2	0	1	0	3	0	2	0	0	0	0	0	0
Excrements of farm animals	8	5	9	21	15	14	14	12	7	2	10	10	13
Silage fluids	0	4	2	1	1	0	0	0	0	0	0	0	0
Industrial fertilisers	0	0	0	1	0	0	0	0	0	0	1	0	0
Other toxic substances	5	12	3	3	0	4	4	5	2	1	1	3	3
Insoluble substances	11	5	6	11	3	4	3	3	2	2	4	0	3
Waste water	8	10	17	35	20	10	28	24	15	17	12	14	14
Other substances	4	2	3	7	10	8	6	7	3	1	6	7	3
Water detrimental substances impossible to determine	29	9	17	35	14	10	22	24	6	1	3	5	14

Source: SEI

Besides, in 2012 most EDW were caused by humans (including traffic accidents caused by drivers) and inadequate technological state of equipment and facilities handling harmful or very harmful substances.

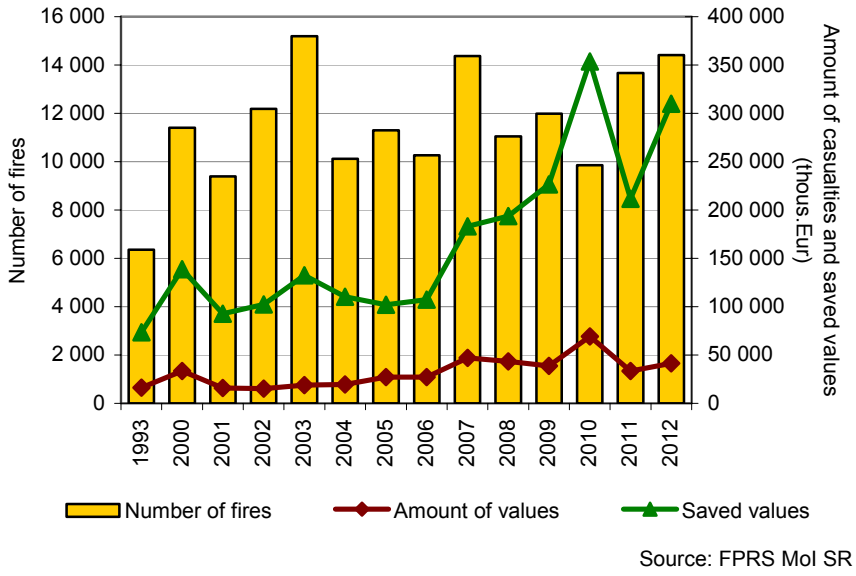
Fire risk

In 2012, Slovakia reported 14 413 fires, which is 736 cases more than in the previous year. As a consequence of these fires, 44 persons died (12 less than in the year before) and 232 people sustained various types of injuries (which is 35 people less). Direct material damage reached 41 394.5 thous. Eur, while the volume of preserved values was calculated at 309 865.6 thous. Eur.

In terms of damage caused by fires in individual economic sectors, **most fires occurred in agriculture** – 2 129 with the damage amounting to 1 745.1 thous. Eur, two casualties, and 7 injured persons. 1 985 fires occurred in the sector of **household management**, killing 25 and injuring 138 persons. Direct material damage reached the value of 7 361.1 thous. Eur. In terms of fire statistics, **transport** shows the third greatest number of fires – 1 279, occasioning direct material damage at 6 027.1 thous. Eur, killing 9 persons and injuring 22.

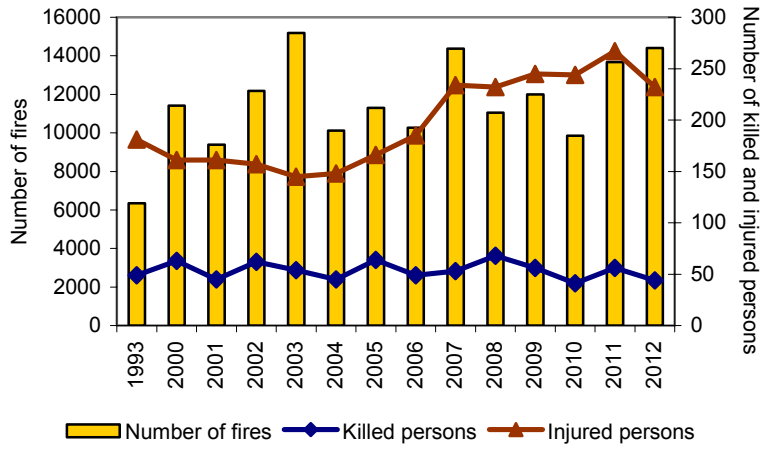
From the perspective of administrative distribution of territory, **most fires** occurred in 2012 in the Košice region (2 927), while **least** fires were recorded in the Trenčín region (1 172). **Greatest damage** due to the occurrence of fires was recorded in the Košice region (12 801.9 thous. Eur) and the **least** in the Nitra region (2 252.2 thous. Eur).

Relationship between number of fires and number of casualties or amount of saved values in 1993, 2000-2012



Source: FPRS MoI SR

Relationship between number of fires and number of killed or injured persons in 1993, 2000-2012



Source: FPRS MoI SR

Floods

In 2012, there were 146 municipalities afflicted with floods, with 269 houses flooded (cellars and basements), 64 non-residential premises flooded, 352.76 ha of flooded agricultural land, 24.00 ha of flooded forestland, and 161.12 ha of flooded municipal land. In total, 140 inhabitants suffered from the aftermath of the floods. There were no casualties reported.

Total cost and damages by floods in the SR in 2012 amounted to 3.27 mil. Eur, including the rescue costs of 0.46 mil. Eur, safety works of 0.37 mil. Eur, and material damage amounted to 2.44 mil. Eur.

Damage to state-owned property caused by floods totaled 0.59 mil. Eur, while damage to private property reached 0.05 mil. Eur. Damage to municipal property reached 0.69 mil. Eur and 0.90 mil. Eur in case of properties belonging to upper regional administrative areas. Damage to the property of legal and natural entities reached 0.21 mil. Eur.

As part of the legislation activities related to Act no. 7/2010 Coll. on flood protection, the Ministry of Environment´s **Decree no. 112/2011 Coll.** was approved. This Decree defines details relating to the contents, revisions, and updates to the flood risk management plans. In total, 559 areas with the occurrence of a significant flood risk were defined in Slovakia. These include 378 geographical areas with existing potentially significant risk of floods, and 181 geographical areas with anticipated probable occurrence of a significance flood risk.

Floods aftermath over the period of 1998-2012

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	
1998	75	3 952	33,34	3,94	1,28	38,56
2000	220	76 494	40,97	0,30	1,84	43,11
2001	379	22 993	65,08	1,90	1,07	68,05
2002	156	8 678	50,64	2,13	1,66	54,43
2003	41	744	1,43	0,19	0,14	1,76
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
2011	87	3 076	20,01	2,00	12,58	34,59
2012	146*	538	2,44	0,37	0,46	3,27

* Number of municipalities with declared III. degree of flood activity

Source: WRI

• GENETIC TECHNOLOGIES AND GENETICALLY MODIFIED ORGANISMS

Key questions and key findings

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

- **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

Use of genetic technologies and genetically modified organisms (GMO) in Slovakia falls under the following provisions:

- Act 151/2002 Coll. on the use of genetic technologies and genetically modified organisms as amended that was revised in 2012 by Act 448/2012 which amends and supplements Act 151/2002 Coll. on the use of genetic technologies and genetically modified organisms as amended and on supplementation to Act 24/2006 Col. on environmental impact assessment and on change and supplementation to certain laws as amended.
- MoE SR Resolution 399/2005 Coll., and MoE SR Decree 312/2008 Coll., which executes Act 151/2002 Coll., on the use of genetic technologies and genetically modified organisms as amended.

The law makes it possible to use genetic technologies and genetically modified organisms in the following ways:

- in enclosed areas (devices),
- intentional release, including a) introduction to the environment,
  b) introduction to the market.

♦ Using of genetic technologies and genetically modified organisms in vitro

Plans the use of genetic technologies and genetically modified organisms in enclosed areas (laboratories, greenhouses, cultivating rooms, and other enclosed facilities) is divided into four at risk categories (RC), while the RC 1 represents no or negligible risk, RC 2 means small risk, RC 3 means medium risk, and RC 4 means significant risk.

On the basis of received applications and notifications, Ministry of Environment issued a permit to 27 confined areas in 2012 for their first use. The Ministry did not have any objections as to the beginning of activities classified in RT 1 in 101 confined areas, and those classified under RT 2 in 15 confined areas.

In 2012, the Ministry did not receive applications for permission to start the RT3 and 4 activities.

♦ Intentional release

Intentional release is a purposeful introduction of GMO or GMO combination into the environment (experiments) without the use of protective measures, pursuant to part B of the European Parliament and of the Council Directive 2001/18/EC or making them available to third parties as marketed products according to part C of this Directive.

In 2012, the Slovak Ministry of Environment issued a permit for growing genetically modified corn types - MON 89034 × NK603 and NK603 × MON 810.

♦ 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 14 permanent members and 16 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 25 times in 2012. It responded to the proposals for issuing permits for the first use of confined areas, to the notices on activities started in confined areas, and to the introduction of generically modified crop into the environment.

ENVIRONMENTAL CARE

• ENVIRONMENTAL POLICY

State environmental strategy over the recent years has built on a number of environmentally complex (cross-sectional) and partial (sectoral to union) strategic and follow-up programme documents, in summary, mainly on

- **Strategy, principles and priorities of the State Environmental Strategy** (National Council Resolution no. 333/1993 and Government Resolution no. 894/1993 and no. 531/1994)
- **National Strategy of Sustainable Development** (SR National Council Resolution 989/2002 and SR Government Resolution no. 978/2001)
- **Integrated Approximation Strategy in the chapter of Environment** (SR Government Resolution no. 138/2001)
- **Operation Programme of Environment for the years 2007-2013** (approved by the EC on November 8, 2007)

The Strategy of environmental conservation overt the horizon of twenty years has been addressed by all SR programme declarations including the **SR Government Programme Declaration for the years 2012 - 2016.** (PVV SR approved by SR Government Resolution no. 144/2012 and the SR National Council Resolution no. 24/2012) that builds on the PVV SR Resolution of 2005.

Under the PVV SR of 2012, the basic policy behind the SR Government actions by 2020 in the conditions of permanent social dialogue will be to eliminate the impacts of the crisis and ensure the unity of the economic, social, political, and environmental development of Slovakia. The Government sees as one of the key tasks the establishment of long-term tendencies for the economic, social, environmental, and scientific and technological development of Slovakia, as well as for improving the quality of life to secure sustainability. At the same time, the Government guarantees social, economic, and ecological stability. It intends to react to the changes in the flexible and effective manner and restore the balance between the economic, political, and environmental development of the society. Within the process of the European Union's attempts to ensure sustainable development, the Government will support sustainable economic development in Slovakia as a precondition for the creation of high-quality jobs and improvement of material conditions existing in every social activity. The Government will define the country's basic orientation toward becoming a competitive economic area based on knowledge, social cohesion, and environmental development. This will create conditions for a faster and more sustainable economic growth and a higher level of employment and social progress. The Government gives priority to the creation of a unified system in support of the green growth. The system is to become the transforming force behind the production processes and consumer behaviour that are the pre-condition for the creation of a modern society. The SR Government will create conditions for further development of regions and elimination of regional discrepancies, especially through building the infrastructure and strengthening the regions through

investments into production. Important priorities of the Government will stay the issues relating to the environment protection, adoption of effective international measures to reduce the speed, and mitigating the impacts provoked by the climate change. The Government will take further initiative to reduce the energy-demanding industrial production, strengthen its orientation toward the green economy and protection of biodiversity.

In relation to securing the sustainable economic development, the SR Government also specifically defines STATE POLITICAL GOALS TO ENSURE ENVIRONMENTAL CONSERVATION.

PVV SR is to be followed by a **new concept of the environmental strategy of the Slovak Republic** approved by the Resolution of the Executive session of the Slovak Ministry of Environment of 28th March 2013 no. 62. This concept called: ***"Orientation, principles and major tasks in the environmental conservation of the Slovak Republic for 2014-2020"*** at the same time creates the ideological basis for drafting the **Operation programme of the environmental quality for the years 2014 - 2020.** The document contains **8 strategic goals, 10 principles, 7 priorities with 85 major tasks** selected according to 5 criteria.

In line with the environmental situation in Slovakia, EU and SR strategic documents and policies, mentioned direction and principles of the national environmental strategy and its **global strategic target** of **developing the environment, protecting its elements and the nature, ecologisation and creation of environmentally safe, appropriate and usable landscape along with the rational use of resources and total strengthening and interconnection of the environmental pillar of the sustainable development with its economic and social pillars and support for the completion and building a better quality within the environmental infrastructure,** the following **seven sectoral priorities in the area of environmental conservation in Slovakia** were defined:

1. **Protection and the rational use of waters and the integrated environmental management of watersheds** (8 major tasks)
2. **Adaptation to adverse consequences of climate change and the flood protection** (11 major tasks)
3. **Air and the ozone layer protection, introduction of low-carbon and environment-friendly technologies** (17 major tasks)
4. **Minimisation, recovery, and elimination of waste, effective use of resources, and development of the green economy** (14 major tasks)
5. **Conservation of biodiversity, natural heritage and landscape** (11 major tasks)
6. **Protection and the rational use of the rock environment, elimination of special environmental risks and loads** (6 major tasks)
7. **Supporting the environmental awareness and education, science, research and development, environmental monitoring and information science, and voluntary tools of the environmental strategy**

ENVIRONMENTAL CARE

• ORGANISATION OF ENVIRONMENT

The year 2012 was the climax of the two decades of existence of the **Ministry of Environment of the Slovak Republic** (MoE SR) instituted on August 25, 1992 by the Slovak National Council Act No. 453/1992 Coll which amends and substitutes the Slovak National Council Act no. 347/1990 Coll on the organisational structure of ministries and other central government administrative institutions in Slovakia. As a matter of fact, this Ministry was created through renaming the former central administration environment authority - **Slovak Commission for the Environment** (SKŽP) instituted as of March 30, 1990 by Act 96/1990 Coll on the establishment of the Slovak Commission for Environment and on changes to the competencies of different ministries of the Slovak Republic. The mentioned law excluded from the **Ministries of interior and environment of the Slovak Republic** the activities overseeing the environmental conservation effective as of 20th April 1988 by the National Council Act no, 50/1988 Coll. on changes to the organisation and competencies of individual ministries and other central government authorities of the Slovak Socialist Republic.

Under special environmental-related legislation, the Ministry of Environment is defined under Act No. 525/2003 and other special legal provisions as the **central environment conservation body that participates within 35 subsystems as the central authority of**

- state administration for **air protection,**
- state administration in the matters relative to trading with emission allowances,
- state administration for the ozone layer protection and the Earth´s climatic system,
- state administration for professional qualification to verify emission calculations and for other measures in the area of greenhouse gases emissions.
- state administration in the matters relating to the handling of fluorinated greenhouse gasses, products and equipment,
- state administration in the area of persistant organic compounds,
- state administration for hydrological survey and the state meteorological survey,
- state **water administration,**
- state administration for flood protection,
- state administration in the area of public water supplies and public sewerage systems,
- state administration in the area of fishing,
- state administration of **Nature and landscape protection,**
- state administration of the protection of individual wildlife animals and plants through regulating their trade,
- state administration in the matters of genetic technologies and genetically modified organisms,
- state administration for the integrated **prevention and control of environmental pollution,**
- state administration in the area of prevention and remedying of environmental damage,

- state administration of environmental impact assessment,
- state administration in the area of prevention of major industrial accidents,
- state administration in the area of environmental loads,
- state **geological administration,**
- state administration for detecting and archiving abandoned mines,
- state administration in the area handling the waste from mines,
- state administration of **waste management,**
- state administration for packagings and packaging waste,
- state administration in the area of **environmental product labelling,**
- state administration in the matters of **environmental management and audit,**
- state administration in the area of collection, storage, and dissemination of **environmental information,**
- state administration of the national infrastructure for spatial information
- state administration for annual publishing of the report on the state of the environment and for making accessible the information about the environment,
- state administration for the single information system on the environment and the spatial environmental monitoring,
- state administration for releasing data on quite areas within the open landscape,
- state administration of the **environment fund** and state supervision over the use of the Fund's resources,
- state administration for **management and control of the state administration activities within environmental conservation** carried out by regional environmental authorities, and revision of their decisions published within administrative proceedings,
- partly for providing **environmental education**, awareness building and promotion,
- partly for **classification, labelling, packaging and marketing of substances in mixtures and in products with the conditions for their use,** and for marketing biocidal products and low-risk biocidal products.

Slovak Ministry of Environment is the constituting agency of 8 contributory organisations:

- **Slovak Environment Agency** in Banská Bystrica**,**
- **State Geological Institute of Dionýz Štúr** in Bratislava**,**
- **Slovak Hydro Meteorological Institute** in Bratislava**,**
- **Water Research Institute** in Bratislava,
- **Slovak Museum of Nature Protection and Speleology** in Liptovský Mikuláš,
- **Slovak Mining Museum** in Banská Štiavnica,
- **Zoological Garden in Bojnice,**
- **State Nature Conservancy of the Slovak Republic** in Banská Bystrica that took over administration offices of 9 national parks, 14 protected landscape areas, and, as of January 1, 2008, the Administration of the Slovak Caves in Liptovský Mikuláš.

Slovak Ministry of Environment is the founding agency of 3 state enterprises:

- **Slovak Water Management Enterprise** in Banská Štiavnica,
- **Water Management Constructions** in Bratislava,
- **Moldava recycling enterprise** in Moldava nad Bodvou.

State **environment fund** has a unique position within the resort of the Slovak Ministry of Environment. The Fund was established by Act 587/2004 Coll. and came into force on January 1, 2005 (originally from March 7, 1991 until April 1, 1998 as the State Fund of the Environment of the Slovak Republic, from April 1, 1998 until January 1, 2002 as the State Fund of the Environment).

In total, since October 1, 2013 the resort of environmental conservation comprises now only **14 legal entities,** including 2 state administration authorities (the Slovak Ministry of Environment, and the Slovak Environmental Inspection Authority), 1 state fund, 8 contributory organisations, and 3 state enterprises.

Other sectors of environmental conservation, within environmental safety, feasibility, usability, loading capacity and aesthetics, focused mainly on the protection and rational use of natural resources (rocks, soil, forest) and other ecosystem services, physical planning and building code, protection of immovable cultural monuments and their sets, environmental science and research, environmental education and promotion, nuclear safety, safety of foods and forage, elimination of negative physical, chemical and biological environmental factors on the health of humans and animals, as well as the organisation and execution of the local state administration in the area of environmental conservation, provided by the Ministry of Agriculture and Rural Development, Ministry of Economy, Ministry of Transport, Construction and Regional Development, Ministry of Health, together with Public Health Authority of the Slovak Republic, Ministry of Culture of the Slovak Republic, Monument Board, Ministry of Education, Science, Research and Sports, Slovak Academy of Sciences, Ministry of Interior, Nuclear Regulatory Authority of the Slovak Republic. For example, subjects that have been participating throughout the process of carrying out the state environmental strategy involve the Ministry of Foreign and European Affairs of the Slovak Republic, Ministry of Justice of the Slovak Republic, Ministry of Finance of the Slovak Republic, Statistical Office of the Slovak Republic. The SR Government Office as the supervising and coordinating authority of sustainable development has a special status. The process especially involves implementation of the Agenda 21 and the subsequent international and national strategic documents, especially the **National Strategy for Sustainable Development** approved by the SR National Council Resolution no. 1989 of April 3, 2002. In its Resolution no. 655 of September 16, 1997, the Slovak Government approved supervising and coordinating authorities of individual Agenda 21 chapters and for the sustainable development assessment process in Slovakia.

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 2012, the **process** of environmental impact assessment of 900 proposed activities and 263 strategic documents **was finalised.**

In the area of international cooperation, the Slovak Ministry of Environment carried out tasks defined by the **EU Directives** relating to the environmental impact assessment at the level of individual activities and strategic documents, and **Convention on Environmental Impact Assessment in a Transboundary context** (Epsoo Convention) Workers of the Slovak Ministry of Environment were involved in consultations and were supplying the European Commission the relevant information in the area of environmental impact assessment.

In 2012, it was necessary to conclude the last part of the proceeding in the matter of faulty and/or incomplete transposition of Directive 2001/42/EC of June 27, 2001 on the assessment of the effects of certain plans and programmes on the environment. (SEA Directive) The problem was that the SEA Directive requires that all the changes to strategic documents complying with the provisions of art. 2(a) and art. 3(3)(2) be subject to the compulsory assessment. As for smaller changes to the strategic documents, it is possible to carry out so-called enquiry proceedings. (art. 3(3)) Slovak legislation used to be adjusted so as to accommodate all changes to the strategic documents under the enquiry proceeding. This is what the Commission objected to in their response to the Slovak Republic.

Definition of the small change to the strategic document subject to the enquiry proceeding was revised by the **revised Act no. 448/2012 Coll.** that came into force on January 1, 2013. This change to the EIA Act **eliminated the shortcoming** of the Slovak legislation. Consequently, the Commission after being notified of the change suspended the non-compliance proceeding against the Slovak Republic.

Number of completed assessments of the proposed activities (EIA) and strategic documents (SEA) in the SR in 1994–2012

	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
2011	559	136
2012	900	263
Total	**6 985**	**904**

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 2012, operators submitted **590 applications** in total for obtaining integrated licenses. In 401 cases of the total number of submitted applications, the operators asked for changes to the already issued integrated license. In 12 cases, an application was submitted for new operation and 177 applications related to the proceeding under Act no. 50/1976 Coll. on physical planning and building code as amended (the Building Act). Besides, one 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 for a change to this license.

In 2012, 213 inspections relating to the compliance with the conditions for integrated licensing were performed. They included the state building supervision, testing the accuracy of the data contained in the application for integrated licensing, as well as inspecting the integrated licensing conditions. The mentioned number of inspections includes also those performed at specific requests. Of total number of inspections, 166 involved inspecting the integrated licensing conditions, 36 inspections related to inspecting the correctness of the data provided in integrated licensing applications, and 11 inspections related to the State building supervision determining whether the construction has been carried out pursuant to the building permit, or on the basis of a prior notice. Of the total number of inspections, 62 operations were shown as non-compliant with the criteria of integrated licensing.

• PREVENTION AND REMEDYING ENVIRONMENTAL DAMAGES

The area of prevention and remedying the environmental damage in Slovakia has been regulated by **Act No. 359/2007 Coll. on the prevention and remedying of the environmental damage and on amendment and supplementation of certain 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 2012, there was no environmental damage recorded in Slovakia.

• PREVENTION OF MAJOR INDUSTRIAL ACCIDENTS

Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances (SEVESO II) has been transposed into the Slovak legislation by

- Act No. 261/2002 Coll. on the prevention of major industrial accidents and on amendment and supplementation of certain laws (The Accidents Act),
- Decree of the Slovak Ministry of Environment No. 489/2002 Coll. that executes certain provisions of Act No. 261/2002 Coll. on preventing major industrial accidents and on amendment and supplementation of certain laws,
- Decree of the Slovak Ministry of Environment No. 490/2002 Coll. on security report and on accident-management plan as amended.

The Accidents Act divides enterprises by total volume of hazardous substances present into the **lower level** enterprises i.e. **category A** enterprises and the higher level, i.e. **category B** enterprises **(so-called SEVESO enterprises).**

Complex overview of the information regarding the prevention of major industrial accidents may be found from the **Information system for the prevention of major industrial accidents** (**http://enviroportal.sk/seveso/informacny-system.php**).

As of December 2012, **82 enterprises** were regulated in Slovakia under the regime of the Accidents Act. This number of **included 41 category A enterprises** and **41 category B enterprises.**

In 2012, the Slovak Ministry of Environment did not receive **any** report on **major industrial accidents** pursuant to the Accidents Act.

Trend in the number of enterprises under the regime of the Accidents Act since its coming into force

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Category A enterprises	Transitional period (art.31)	30	31	31	28	33	35	36	40	39	41
Category B enterprises		37	35	39	40	39	40	41	42	41	41
Total		**67**	**66**	**70**	**68**	**72**	**75**	**77**	**82**	**80**	**82**

Source: MoE SR

In 2012 came into force the EU Parliament and Council Directive No. 2012/18/EU of July 4, 2012 on on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC. This Directive, also called the SEVESO III Directive, is to be transposed into the system of legal regulations of the Slovak Republic by May 31, 2015. Provisions of this Directive will be implemented as of June 1, 2015 with the exception of Article 30 that must be implemented by February 14, 2014.

ENVIRONMENTAL ASSESSMENT AND PRODUCT LABELLING

Environmental labelling type I

Environmental labelling of products in Slovakia has been carried out since 1997, with the declared **National Programme of Environmental Assessment and Product Labelling (NPEHOV).** Slovak Ministry of Environment, through its national environmental labelling scheme grants the national environmental label called: **"Environment-friendly product (EVP)"** to those products and services that fulfilled the set environmental criteria. Since 2002, the conditions and the procedure for granting and using the national label have been regulated by Act 469/2002 Coll. on environmental labelling of products as amended. National environmental criteria for selected categories of products are published as special conditions through the **Slovak Ministry of Environment's notices**. In total, since 1997, national environmental criteria for **38 product categories** have been created.

Assessment of compliance of the registered products with the set special conditions for the given product category has been carried out on the basis of shown interest by producers, importers, sales persons or services providers to be granted the national environmental label. In total, **234 products** have been assessed and granted the "Environment-friendly product" label since 1997 in Slovakia. The highest total number of products with the right to use the EVP national environmental label - 148, was recorded in 2008 and 2009. In 2012, this number declined to 117. Trend in the new numbers of EVP labelled products is declining.

At Slovakia's entry to the EU in 2004, applicants were given the possibility to get their products labelled with the European environmental label - **"European flower"** (the current **"EU Ecolabel")** pursuant to the Regulation of the European Parliament and of the Council (EC) no. 1980/2000 later revised and substituted with the current valid Regulation of the European Parliament and of the Council (EC) no. 66/2010 on the EU Ecolabel. Environmental criteria for granting the **"EU Ecolabel"** to the selected product categories are published as **EC Decisions** in the Official Journal of the European Union.

Environmental labelling type II

The principles of environmental labelling type II are published under the international norm ISO 14021 (STN EN ISO 14021). This type of labelling allows for showing own declarations about the environmental characteristics of the product published by producers, importers, distributors, retailers or any person who is likely to benefit from the given declaration. Own declarations may be shown even in the absence of the third party's certification. Type II labelling allows the producers or importers who improve their environmental behaviour and product quality to increase their competitiveness in those cases when no prior specific requirements under national or Eurpean labelling system have been set.

ENVIRONMENTAL MANAGEMENT AND AUDIT

♦ Environmental management system under ISO 14001 international norm

Environmental management system (EMS) is a set or mutually connected activities with the aim to improve environmental behaviour of organisations or adopt their behaviour to the changing conditions in their own or the surrounding operations.

In 2012, there were 19 new organisations with introduced and certified EMS, which increased the total number of organisations with certified EMS under the ISO 14001 norm since 1996 to 1 132.

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

Conditions to participate in EMAS are set out in **the Regulation of the European Parliament and of the Council (EC) No. 1221/2009** of November 25, 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS III) that came into force on January 11, 2010. At the national level, these conditions are set out in **Act No. 351/2012 Coll.** on environmental certification and registration of organisations within the EU scheme for eco-management and audit and on amendment and supplementation of certain laws, effective as of December 1, 2012.

By the end of 2012, 2 organisations were entered in the national EMAS register **- *SEWA, Inc., Bratislava and CENVIS, Ltd., Bratislava*** from the sector of "Other professional, scientific and technological activities." The company *Messer Slovnaft, Ltd., Bratislava - Vlčie hrdlo* in the sector of "Production of industrial gases" cancelled at its own request the registration due to changes in the organisation structure and termination of technological gases production.

• GREEN PUBLIC PROCUREMENT

Green public procurement - GPP is one of the voluntary tools of the environmental strategy. The term voluntary means that individual EU member states and public organisations themselves may choose to what extent they will apply it.

In 2012, Slovakia carried out its responsibilities given by the **National Action Plan for Green Public Procurement in the Slovak Republic for the years 2011 to 2015** (NAP GPP II) approved by SR Government Resolution no. 22 of January 18, 2012. As part of the GPP level monitoring in the Slovak Republic, 450 survey questionnaires were sent out and 293 responses were collected.

Average level of GPP implementation in Slovakia for the year 2012 has been determined on the basis of 2 indicators:

Indicator 1: % of GPP of total public procurement in relation to the number of deals (signed agreements and orders) - reaching 5.0% in 2012.

Indicator 2: % of GPP of total public procurement in relation to the value of deals (signed agreements and orders including GDP) - reaching 20.6% in 2012.

Increasing the share in GPP implementation in the Slovak Republic at the level of central administration authorities to 65% and to 50% at the level of local regional and municipal governments is the strategic goal under the NAP GPP II by 2015.

To reach this goal, three partial goals have been set within the NAP GPP II scheme:

- to build awareness of public procurement agencies and purchasers of the GPP issues in Slovak conditions,
- to strengthen the implementation of environmental characteristics in public orders,
- to assess the level of GPP implementation in the Slovak Republic in relation to the EC requirements.

GPP monitoring in Slovakia for the year 2012 points to the fact that the indicators that determine the average level of GPP implementation in Slovakia reach low values and the principle of continuous improvement has not been carried out. Indicator 1 increased by 2.9% compared to 2011. At the same time; however, the average GPP level within Indicator 2 declined by 21.6%. Data show that while there were more green orders, on the other hand they had lower volumes, which might have been caused by the economic recession.

• ENVIRONMENTAL EDUCATION

♦ Environmental education and promotion within the resort of the Slovak Ministry of Environment

Major activities and programmes addressing the environmental education in 2012 included, for example, **Hypericum** (competition in natural sciences organised in SESV Dropie), **EnviroOtázniky** ***/EnviroQuestions/*** (VIII. annual event) 1 326 level II elementary students from 222 elementary schools registered for the competition, www.envirotazniky.sk), **ProEnviro** – VIII. annual competition. 56 school projects were registered in the competition. Within this competition, cooperation with the company SHP Harmanec, a.s. started. **Zelený svet** ***/Green World/*** - (XVII. annual international children competition in fine arts creativity) This year, 354 schools participated in the competition. 2 620 works of 2 774 young authors from various types of schools were registered. Schools from abroad sent 98 works. (Serbia, China, Latvia).

Organised **school programmes** included for example the following events: **Na túru s NATUROU** ***/On a hike with NATURA/*** - mapping of biodiversity in Slovakia at the www.snaturou2000.sk web portal. As of January 10, 2013, 122 survey groups were registered, more than 799 students and teachers were involved, and 223 sites were mapped, along with 1 414 registered entries), **Ekologická stopa** ***/Ecological Footprint/*** *(*an innovative web-based programme. www.ekostopa.sk. As of January 10, 2013, 650 of schools from the whole of Slovakia participated in the programme. As part of the 3rd-year anniversary of the World Environment Day on June 5, 2012, certificates of ecological footprint were awarded to 86 schools) **BEAGLE** (school on-line project about biodiversity - project is accessible to all schools in Europe at www.beagleproject.org, a 2-day training of teachers was organised in SEV Dropie as part of the project), **Programmes at SEV Dropie** (all year round, 1-day and more-days field trips and excursions were organised for various target groups), **World Environment Day at the Bojnice ZOO** (45 participants of the elementary school in Čierny Balog came). They learned interesting information related to the life of certain wild animals, their behaviour and which of them are endangered.

In 2012, a number of follow-up **seminars, conferences, and events** were organised, along with the **environment important days:**

- **Envirofilm** (largest promotional event of the Slovak Ministry of Environment for the lay and professional public). Main objective of this international film festival on the environment and its accompanying cultural and professional events is to raise environmental awareness of the public through implementing environmental activities, after-festival visits and exhibitions)
- **Environmental Teaching Programmes Fair - ŠIŠKA 2012** (XV. annual fair of environmental teaching programmes designed for people involved in environmental education. The fair took place on 14. – 16. 12. 2012 in the Dudince Spa)

- **IT Conference on Environmental Education** (an independent accompanying event about the use of information and communication technologies in environmental education during the Enviro-i-Forum 2012 event).

• 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 system (IMS, http://www.enviroportal.sk/informacny-system-zp/cms/informacny-system-monitoringu-zp) 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.

Funds invested in environmental monitoring (thous. EUR)

PMS	2004	2005	2006	2007	2008	2009	2010	2011	2012
Air quality	610.77	560.98	961.66	1 916.88	1 179.11	989.16	566.58	601.7	519.6
Meteorology and climatology	1 161.79	864.07	2 523.17	982.84	2 409.55	742.66	361.65	488.9	428
Water	803.03	1 451.14	1 475.37	3 334.00	1 756.57	4 817.57	522.38	223.9	892.7
Radioactivity	48.26	49.79	84.48	76.38	49.79	39.43	30.75	11.7	15.28
Waste	116.18	126.14	34.52	144.53	79.43	60.51	21.15	20*	25*
Biota	19.92	33.19	33.19	33.19	17.09	0.00	0.00	0.00	0.00
Geological factors	331.94	331.94	331.94	298.75	348.54	348.54	289.39	306.5	367
Soil	305.38	318.66	302.06	232.36	267.24	206.84	133.51	114.4	93.97
Forests	96.26	146.05	265.55	569.57	337.68	369.58	362.0	126.0	121.5
Xenobiotic substances	908.88	413.40	507.90	282.15	351.74	387.30	402.0	380.8	131.4
Total costs	**4 402.41**	**4 295.37**	**6 519.85**	**7 870.64**	**6 796.75**	**7 961.59**	**2 689.41**	**2 273.9**	**2 594.45**
MoE SR costs	3 091.88	3 417.25	5 444.33	6 786.56	5 840.09	6 997.98	1 791.9	1 652.7	2 247.58

* SEA wage bill

Source: MoE SR

• ENVIRONMENTAL ECONOMY

Environmental revenues and expenses

Financial indicators of the environmental protection in Slovakia have been systematically monitored by the Statistical Office of the Slovak Republic (SO SR) both as investments, current expenses - (internal corporate, salary, other), organisation costs to other subjects (payments to state authorities, payments to private entities) and revenues from environmental protection. Reference units comprise enterprises with 20 and more employees, and municipalities.

Environmental revenues and expenses of enterprises* and municipalities in 2012 (in thous. EUR)

Indicator	2012
Investments to environmental protection of which	**252 115**
- paid from the state budget	46 357
Current expenses for environmental protection	**550 649**
Internal corporate expenses including	**265 949**
- salaries	71 911
- other expenses	194 038
Corporate expenses for environmental protection paid to other subjects including	284 700
- fees and payments to state administration authorities and agencies	40 651
- payments to private persons and organisations	244 049
Total revenues from environmental protection	**596 989**

*Enterprises with 20 or more employees Source: SO SR

Expenses by enterprises and municipalities for the environmental protection show a fluctuating trend. Greatest sum of expenses was incurred in 2006. Expenses of enterprises and municipalities for environmental protection reached the sum of **802 764 thous. EUR** in 2012. Expenses of enterprises and municipalities compared to the previous year grew by 0.2%, and by 129.4% compared to 2000.

The environmental fund

The Environment Fund was established since January 1, 2005, by Act 587/2004 Coll., on environment fund and amendment to certain laws. Environment Fund focuses on supporting sustainable environmental conservation and creation from the State budget. The Fund accentuates support to the applicants who have not opportunity to receive international assistance (e.g. municipalities with fewer than 2 000 inhabitants for their sewerage building projects) with the aim to gradually complete unfinished construction of the environmental infrastructure projects.

Review of financed grants in 2012

Area of budget grants	Number	EUR
Protection of air and of ozone layer	0	0
Protection and rational efficiency of water	331	27 906 638.00
Development of waste management	1	281 139.00
Protection of nature and lands	12	520 947.00
Environmental education and promotion	13	138 268.57
Accidents	1	30 000.00
Survey, research and development	19	3 445 042.58
Green Investment Scheme	0	0
Total	**377**	**32 322 035.15**

Source: Environmental fund

Of the mentioned subsidies, assistance to help solve the critical environmental situation was granted to 20 applications in the sum of 4 105 433.58 EUR. Village Renewal Programme obtained assistance from subsidies totalling 459 377.38 EUR and distributed over 122 projects. **Total subsidies in 2012 were released for 499 applications in the sum of 32 781 412.53 EUR.**

Selected economic tools of the environmental strategy

Within the existing Slovak conditions, **fees/payments for pollution and exploitation of natural resources** represent the key economic tools. Individual types of these economic tools are defines in pertinent legal regulations, including their computation and the beneficiary. Along with fines, they are also a significant source of the Environment Fund´s revenues.

In 2012, the highest sum collected for environmental pollution by the Environment Fund came from air pollution fees (12 803 382.25 EUR), while the highest sum collected for exploiting natural resources came from fees for groundwater abstraction (10 674 427.70 EUR).

Gains from the Environmental Fund of selected economic instruments applied in 2012 (€)

Charges	EUR
Charges for pollution of air	12 803 382.25
Fees for extracted minerals	2 516 269.51
Charges for storage of gases and liquids	1 021 028.67
Fees for wastewater discharge	7 174 630.86
Fees for groundwater extraction	10 674 427.70
Fees for surveying area	1 127 400.33
Financial compensations for impacts into European significant habitats pursuant to the Act on Nature and landscape protection	1 000.00
Total	**35 318 139.32**

Source: Environmental fund

In 2012, the highest revenue into the Environment Fund was collected in the area of waste management (242.35 thous. EUR) and in the area of water protection. (207.81 thous. EUR).

♦ Fees for air pollution

Fees for air pollution by large and medium-size pollution sources represent the Fund's revenues. Fees for air pollution by small-size sources constitute the municipalities' revenues.

Fees for air pollution by large-size and medium-size pollution sources show fluctuating trend, reaching 12 803.38 thous. EUR is 2012. Fees for air pollution declined compared to the previous year by 2.6%, and by 34.9% compared to the year 2000.

♦ Payments for surface water abstraction from watercourses

Revenues from surface water supply show fluctuating trend, reaching 26 317 thous. EUR in 2012. Revenues from surface water supply declined compared to the previous year by 2.4%, and by 20.7% compared to the year 2000.

♦ Average price of surface water

Average price of surface water in 2005 - 2011 was rising and reached the level of 0.11 EUR/m^3 in 2012, copying the previous year's figures Average price of surface water compared to 2000 grew by 0.06 EUR/m^3.

♦ Payments for the use of the hydro-energy potential of watercourses at water constructions, based on the administration body's report

Payments for the use of the hydro-energy potential of watercourses at water constructions, based on the administration body's report, show fluctuating characteristics, reaching 23 358 thous. EUR in 2012. Payments for the use of the hydro-energy potential of watercourses declined by 1 465 thous. EUR (5.9%) compared to the previous year, and grew by 160.6% compared to 2002.

♦ Revenues from groundwater abstractions

Revenues from groundwater abstractions show fluctuating trend, reaching 10 674.43 thous. EUR in 2012. Fees for groundwater abstractions declined compared to the previous year by 3.6%, and by 25.5% compared to the year 2000.

♦ Price for the supply of drinking water over the public water supplies and for wastewater channelling and treatment

Pricing strategy in the area of water management represents a set of principles and measures used by the State at the creation and implementation of prices, and with consideration to social and public utility goals of the Slovak republic. Price regulation and control is also part of the pricing strategy.

Average price for drinking water production, distribution and supply over public water supplies shows a rising trend. Average price grew by 5.2% in 2012 compared to the previous year, reaching the value of 1.01 EUR for 1 m^3 (GDP excl.).

Average price for wastewater channelling and treatment over public sewerage systems shows a rising trend. Average price grew by 4.7 % in 2012 compared to the previous year, reaching the value of 0.90 EUR for 1 m^3 (GDP excl.).

♦ Compensation for surveyed areas

Compensations for surveyed areas have followed the provisions of Act 569/2007 Coll. on geological works. 50% of the paid compensation is the Environmental Fund's revenue, while the other 50% go into the budget of the municipality where the survey is carried out.

Compensations for surveyed areas in the period of the years 2004 - 2008 showed a rising trend. In 2009, there was a decline in compensations. Their subsequent growth was recorded in the following years. Compensations for surveyed areas in 2012 that represented the Fund's revenues reached the sum of 1 127 400 EUR, which was an increase by 13.2% compared to the previous year.

♦ Compensation for the mining site

Compensation for the mining site pursuant to Act 44/1998 Coll. on the protection and use of minerals (The Mining Act) at its 20% is the revenue of the State budget, while the remaining 80% go into the budget of the municipality where the mining site is located. If the mining site is located in the administrative areas of more municipalities, the circuit mining authority shall determine and assign to the each of the municipalities its proportional part, based on the site's size located in the municipality's territory.

In 2012, compensations for mining sites reached the sum of 517 162 EUR. Compared to the previous year, compensations declined by 1%.

♦ Compensations for extracted minerals

Compensations for extracted minerals pursuant to Act 44/1988 Coll, on the protection and use of minerals show fluctuating characteristics. Highest value of compensations for extracted minerals was reached in 2007. (4 817 635 EUR) In 2012, compensations for extracted minerals reached the sum of 2 155 585 EUR. Compared to the previous year, compensations declined by 4.6%.

Environmental tax

Share of environmental taxes in GDP in Slovakia shows fluctuating characteristics. The highest share of environmental taxes in GDP was reached in 2004.

In 2011, revenues from environmental tax were 1.84% of GDP, and 6.46% of total revenues from taxes. Compared to the neighbouring EU countries, share of environmental taxes in GDP in Slovakia showed the lowest level.

Funding the environmental care within international programmes/projects

♦ Operation Programme of Environment

Operational programme of Environment (OPE) is the programming document for Slovakia 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 2012, the Slovak Ministry of Environment issued **5 calls** for applications for non-refundable financial benefit (NRFB), with the total allocated sum of **110 406.141 EUR.**

Overview of the approved projects since the beginning of the programming period until December 31, 2012

Priority axis	Number of approved projects	Sum of approved grants (€)
1. Integrated protection and rational water exploitation	161	1 036 759 111
2. Flood protection	67	100 692 393
3. Air protection and minimisation of adverse impacts of climate change	109	172 598 248
4. Waste management	267	415 244 236
5. Protection and regeneration of natural environment and landscape	40	55 962 888
6. Building the flood alarm and forecast system	0	0

Source: ITMS

♦ Large-scale projects (exceeding 50 million EUR)

Large-scale projects represent also for Slovakia a significant step in meeting the obligations under the EU Accession Agreement, i.e. set transitional periods for the implementation of the Council Directive 91/271/EEC on wastewater treatment.

Monitoring committee for the Operation Programme of Environment approved at its session of 28/06/2011 a change to the list of large-scale projects for Operation Programme of Environment. The approved list contained 9 large-scale projects prepared within the Priority Axis 1. Since the last revision, no changes have occurred to the list.

The preparatory phase was successfully completed for the 9 large-scale projects, i.e. feasibility studies and drafts of applications to confirm assistance were approved. For 7 large-scale projects, applications for NRFB were submitted. The applications fulfilled the requisites for granting assistance. The corresponding applications to confirm assistance were sent to the European Commission for approval. Of the sent applications to confirm assistance, 5 have been approved (Ružomberok, Ilava, Trenčín, WWTP sever and Orava 2.phase) and 2 applications are still assessed until December 31, 2012. (Podunajsko and Prievidza)

For the projects like "Water supply, wastewater sewage and treatment of the district of Bytča, and "Drinking water supply and building sewage municipal capacities in the micro-region of the Bodva River" the applicants were called to submit applications for NRFB. In the case of complying with all the conditions for granting assistance, applications for approval will be sent to the European Commission for assessment.

♦ Central Europe transnational Cooperation Programme

Central Europe transnational Cooperation Programme 2007-2013 is a programme within the Objective 3 of the European territorial cooperation and involves 8 EU countries: Austria, Czech Republic, part of Germany, Hungary, part of Italy, Poland, Slovakia, Slovenia. Also partners from the western part of Ukraine may participate in the projects. 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

Closing the 4.call for project proposals under the programme Central Europe, the possibility to submit applications for non-refundable financial contribution from the ERDF within the programming period of 2007 - 2013 ended.

♦ South-Eastern Europe transnational Cooperation Programme

South-Eastern Europe transnational Cooperation Programme 2007-2013 is a programme within the objective 3 of the European territorial cooperation and involves 16 EU countries: For Slovakia, the whole national territory may qualify for this programme. Total financial allocation for Slovakia under this programme within the period of 2007-2013 represents 9.9 mil. EUR.

The following Priority axes have been defined under the OP JvE programme. The axes are further broken down to the level of intervention areas:

Priority Axis 1: Facilitation of innovation and entrepreneurship
Priority Axis 2: Protection and improvement of the environment
Priority Axis 3: Improvement of the accessibility
Priority Axis 4: Development of transnational synergies for sustainable growth areas
Priority Axis 5: Technical assistance for the supporting implementation and capacity building

Following up on the decision of the monitoring committee in June 2012 in Bologna, the Common Technological Secretariat in Budapest began the process of accounting for all the 37 projects tha had been approved with the condition within the 4. call for project proposals. Total sum for the 4. call was 48 543 094.01 EUR for ERDF. First contracts for projects under the 4. call were signed in October

2012. On the basis of a decision of the monitoring board´s members, a process addressing the accounting conditions for 10 selected projects found on the reserve list within the 4. call. On 14/12/2012, members of the monitoring committee as part of the written procedure approved all 10 projects from the reserve list for funding, including the project PPP4 Broadband with the Slovak leading partner amounting to 999 239.60 EUR.

♦ 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.

5 Slovak projects were approved in 2012 with total volume from the LIFE + grant being 4 904 284 EUR.

Overview of allocated funds from the LIFE+ programme of the Slovak Republic and the actual approved volumes of funds to approved projects

Year	Allocation of funds (€)	Approved funds to approved projects (€)
2007	2 857 000	2 554 812
2008	3 171 000	3 629 000
2009	3 830 000	3 932 000
2010	3 719 834	4 432 261
2011	6 152 190	2 223 606
2012	6 365 639	4 904 284

Source:MoE SR

♦ Global Environmental Facility

Global Environment Facility (GEF) represents a community of countries, international organisations, NGOs and the private sector that aim to protect the environment and sustainable development. GEF was launched in 1991 as a pilot project of of the World Bank in support of projects in the developing countries and the countries with transitional economy.

The GEF Small Grants Programme (GEF SGP) started in Slovakia in March of 2009 with the first round of calls announced in October of 2009. Projects addressed the protection of biodiversity, mitigation of climate change impacts, reduction of international water pollution, prevention of landscape degradation (deforestation and desertification), as well as elimination of persistent organic pollutants (POPs) in Slovakia. This programme designated for non-government organisations has been operated by the Regional Centre for the UN Development Programme for Europe and the Commonwealth of independent states in Bratislava (UNDP). During the 4th operational phase, GEF SGP in Slovakia was funded from funds allocated for climate change.

5th operational GEF SGP phase took place in the period of July 2011 - June 2014. The criterion of sustainability is supported in the area of **climate change,** in order to make sure that the support to GEF SGP for biomass modernisation will not threaten food safety, not increase deforestation, not decrease the soil´s fertility, not increase greenhouse gases emissions outside the project´s area, or not threaten the principles of sustainable development in relation to the protection of biodiversity or sustainable soil and water management.

♦ Norwegian financial mechanism

Within the **programming period of 2009 - 2014,** more than **80 million EUR** were allocated for Slovakia. The number of priority areas stays the same as in the previous period, that is nine. Most of the funds (14.63 mil. EUR) are designated for the **support of green innovations in the industry.** The programme focuses mainly on increasing the number of green jobs and supporting the green business. The programme´s motto is the environmental use of organic waste and biomass produced from agricultural unused areas at the production of green energy. Although the programme´s name is green innovations in the industry, its agricultural component is a critical part of the programme, ensuring the sustainability of projects.

The programme called **Adaptation to Climate Change** implemented through cooperation between the Slovak Government Office and two Norwegian institutions - Directorate for water and energy resources, and Directorate for the protection of inhabitants and crisis planning. Financial contribution to the programme of adapting to the climate change represents 12.46 mil. EUR.

♦ Swiss financial mechanism

On December 20, 2007, representatives of the Slovak Republic and the Swiss Confederation signed a Framework Agreement between the SR Government and the Swiss Federal Council on the implementation of the **Programme of the Swiss-Slovak Cooperation.** The Agreement designated also areas where it is possible to prepare projects. For Slovakia, within the mentioned financial mechanism, funds in the sum of 66 866 thous. Swiss franks (CHF) were allocated, which is approximately 41 mil. EUR into the 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.

Within the area 2.2 Nature protection - on 03/ 10/ 2011, an agreement on the implementation of the project **Promoting the protection of the nature and of the protected areas in the Slovak Carpathians Region** was signed with the applicant - the State Nature Conservancy of the Slovak Republic. Its purpose is to contribute to the improvement of the protection and sustainability of protected areas and selected habitats, as well as to the regeneration of the environment and landscape, mainly within the focal geographical area, and with a special attention to the NATURA 2000 system and the Carpathian Convention. Duration of the project is 48 months and the NRFB accounts for 1 949 825 EUR.

Since August 2011, the National Forest Management Centre in Zvolen has been carrying out **Monitoring and survey of forest ecosystems** with the focus on the preservation of integrity, permanency of production, and the multi-functional character of forest ecosystems within the conditions of on-going climate changes and the impacts of other harmful agents on the environment. Duration of the project is 32 months and the NRFB accounts for 1 964 577 EUR.

INTERNATIONAL COOPERATION

• INTERNATIONAL BODIES

United Nations

The United Nations Conference on Sustainable Development called **Rio+20** organised in Rio de Janeiro has been the most significant international event. The conference took place on June 20 – 22, 2012 to commemorate the 20th anniversary of the Earth Summit (UN Conference on the environment and development in Rio de Janeiro, 1992). The Rio+20 conference hosted a meeting of the heads of states and governments, representatives from public and public sectors including business enterprises, non-government organisations, and civic associations. SR was represented by a delegation lead by the Minister of Environment, Peter Žiga. The Conference's outcome was a final document adopted as a political declaration called: **"The Future We Want".** The Declaration gave rise to international processes leading to the strengthening of the UNEP (United Nations Environment Programme), founding of the high-level Political Forum on Sustainable Development, drafting sustainable development targets, as well as outlining the possibilities for an effective financial strategy of sustainable development.

• EUROPEAN UNION

On January, 19 – 20, 2012, Slovakia hosted the **European Commissioner** for the Environment, Januz Potočnik who held sessions with a number of resorts. During his visit, Mr. Potočnik met also with the Environment Minister, József Nagy. Discussed topics included the issues of nature protection, waste management and air protection, such as EN strategy in the area of biodiversity, funding of protected areas within the NATURA 2000 system, accession of the EU into the Carpathian Convention, effective use of resources, Strategy of Reduction of Work Particles in Slovakia.

Council of the EU Ministers of the Environment adopted Council outcomes accompanying the Notice of the Commission to the European Parliament, Council, European Economic and Social Committee, the Committee of the Regions: **A Blueprint to Safeguard Europe's Water Resources**. This strategy includes measures to secure sufficient volumes of good-quality drinking water for all legitimate ends within the EU with the goal to cope with water stress, shortage of water and the long-term sustainability of our water ecosystems.

In terms of the environmental strategy, continuing efforts in adopting the **7th Environmental Action Programme (EAP)** were very significant. Slovakia supported this activity. EAP is to provide an overall strategic framework for the environmental strategy in the EU.

The agency continued to meet the selected tasks of the EU strategy called **"Our life insurance, our natural capital: an EU biodiversity strategy to 2020"** also in 2012. It carried out preparation of the revised National Strategy of Biodiversity for the years 2012 - 2020. This document was assessed

as the strategic document for the environmental impact assessment and the comments were taken into consideration in its further revision.

Slovakia also took part in negotiations about the drafted EU Parliament and Council Regulation **on Access to Genetic Resources and Fair and Equitable Sharing of Benefits arising from their Utilization,** which will lead to the ratification of the Nagoya Protocol within the EU. In order to implement the EU targets, it is important to comply with the strategy of the green growth in individual sectoral strategies and to adequately consider the aspect of biodiversity within the funding priorities for the programming period of 2014 - 2020.

The priority shared commonly by the EU and Slovakia is to ensure continuity and reach an agreement about the continuation of the **Kyoto Protocol** for the second compulsory period after 2012, including the possibility to use flexible compliance mechanisms.

Slovakia took an active part in 2012 at negotiations about new drafted legislation for the area of **climate change.** The most important drafted documents included a regulation about the greenhouse gases emissions monitoring mechanism that is to supersede the current effective legislation.

• COOPERATION WITHIN THE INTERNATIONAL ARENA

On March 1 - 2, 2012, the Slovak Ministry of Environment hosted the Minister of Environment and Tourism of the Federation of Bosnia and Herzegovina, Branka Djurič and the Minister of Physical Planning, Construction Engineering and Ecology of the Serbian Republic, Srebrenka Golič. The Ministers showed interests mainly in Slovakia's pre-accession EU funds, the area of the Slovak development cooperation, and the topics of recycling, separation, and reclamation of various waste categories.

Vietman delegation comprising the representatives of the Ministry of natural resources and environment headed by the Ministry's Secretary, visited the Slovak Ministry of Environment on July 27, 2012. Negotiations addressed the possibilities for cooperation between Vietnam and the Slovak Republic, specifically in the areas of water management, waste, environmental impact assessment, and mineral exploitation including the subsequent reclamation of the territory after the mining activities.

• INTERNATIONAL TREATIES AND AGREEMENTS BETWEEN GOVERNMENTS

In the area of agreements and treaties, Government of the Slovak Republic in its Resolution No. 582 of 24.10.2012 and the subsequent NR SR Resolution No. 380 of 18.12.2012 agreed to the **Annex to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes** (Water Convention)**.** The mentioned Annex regulates the articles 25 and 26 of the Convention and its ratification by the EEC UN member states allows for accession to the Convention also by those countries outside the EEC UN arena who want to address their trans-boundary issues on the basis of a proven international convention despite the fact that they are not members of the EEC UN.

Agreement between the Slovak Government and the Czech Government on the temporary use of the parts of the Slovak national territory and capital for the construction and operation of a construction project called: "Enlargement of the commercially used Otrokovice - Rohatec water route" on the border water course of Radějovka within the municipal administrative areas of Sudoměřice, Rohatec, and Skalica.

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

Conventions in the area of air protection and chemical substances

- **Convention on Long-Range Transboundary Air Pollution, so-called Geneva Convention** (Geneva, 13/11/1979, Slovakia joined on 22/03/1984)
  - 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 28/01/1988)
  - 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 02/09/1987)
  - Protocol to the Convention on Long-Range Transboundary pollution of 1979, on the Reduction of Nitrogen Emissions or their Transboundary Fluxes (Sophia, 31/10/1988, Slovakia succeeded on 14/02/1991)
  - Protocol to the Convention on Long-Range Transboundary pollution of 1979, on Further Reduction of Sulphur Emissions (Oslo, 14/06/1994, Slovakia succeeded on 05/08/1998)
  - Protocol to the Convention on Long-Range Transboundary pollution, on Heavy Metals (Aarhus, 24/06/1998, Slovakia succeeded on 29/12/ 2003)
  - Protocol to the Convention on Long-Range Transboundary pollution, on Persistent Organic Pollutants (Aarhus, 24/06/1998, Slovakia succeeded on 23/10/ 2003)
  - Protocol to the Convention on Long-Range Transboundary pollution, concerning the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes (Geneva, 18/11/1991, Slovakia succeeded on 14/03/2000)
  - 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, Slovakia succeeded on 27/07/2005)
- **UN Framework Convention on climate change (UNFCCC0**
  (New York, 09/05/1992, Slovakia succeeded on 23/11/1994)
  - Kyoto Protocol (Kyoto, 11/12/1997, Slovakia succeeded on 16/02/2005)
- **Convention on the Ozone Layer Protection, the so-called "Vienna Convention"**
  (Vienna, 22/03/1985, succeeded by Slovakia on 28/05/1993)

- Montreal Protocol on ozone layer depleting substances (Montreal, 16/09/1987, succeeded by Slovakia on 28/05/1993).
- - Montreal supplement to Montreal Protocol on ozone layer depleting substances (Montreal, 17/09/1997, Slovakia succeeded on 01/02/2000)
- London supplement to Montreal Protocol on ozone layer depleting substances (London, 29/06/1990)
- Copenhagen supplement to Montreal Protocol on ozone layer depleting substances (Copenhagen, 25/11/1992, Slovakia succeeded on 08/04/1998)
- Beijing supplement to Montreal Protocol on ozone layer depleting substances (Beijing, 03/12/1999, Slovakia succeeded on 20/08/2002)

- **Stockholm Convention on persistent organic compounds** (Stockholm, 22/05/2001, Slovakia succeeded on 17/05/2004)
- **Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade** (Rotterdam, 10/09/1998, Slovakia succeeded on 26/04/2007)

Conventions on water protection

- **Convention on the Protection and Use of Trans-boundary Watercourses and International Lakes** (Helsinki, 17/03/1992, Slovakia succeeded on 05/10/1999)
  - Protocol on water and health (London, 17/06/1999, Slovakia succeeded on 04/08/2005)
- **Convention on cooperation and sustainable use of the River Danube, so-called Danube Convention** (Sophia, 29/06/1994, Slovakia succeeded on October 1998)

Conventions on nature and land protection

- **Convention on biodiversity** (Rio de Janeiro, 05/06/1992, Slovakia succeeded on 23/11/1994)
  - Cartagena Protocol on biodiversity (Montreal, 29/01/2000, Slovakia succeeded on 22/02/2004)
- **Convention on the protection of free living organisms and natural habitats, so-called Bern Convention** (Bern, 19/09/1979, Slovakia succeeded on 01/01/1997)
- **Convention on Wetlands of International importance, especially as aquatic birds habitats, so-called Ramsar Convention** (Ramsar 02/02/1971, Slovakia succeeded on 02/07/1990)
- **Convention on the Conservation of Migratorz Species of Wild Animals, so-called Bonn Convention** (Bonn, 23/06/1979, Slovakia succeeded on 01/03/1995)
  - Agreement on the Conservation of Bats in Europe of 04/12/1991 (London, 04/12/1991, Slovakia succeeded on 08/08/1998)
    - Supplement No. 2 to the Agreement on the Conservation of Bats (Bristol, 26/07/2000, Slovakia succeeded on 28/03/2010)
  - Agreement on the Conservation of African-Eurasian species of migrating waterfowl (Haag, 15/08/1996, Slovakia succeeded on 01/07/2001)

- **Convention on International Trade in Endangered Species of Wild Fauna and Flora, so-called Washington Convention - CITES** (Washington, 03/03/1973, Slovakia succeeded on 16/12/1992)
- **Convention Concerning the Protection of the World Cultural and Natural Heritage** (Paris, 16/11/1972, Slovakia succeeded on 15/02/1991)
- **International Convention for the Regulation of Whaling** (Washington, 02/12/1946, Slovakia succeeded on 22/03/2005), and **Protocol of Amendment** (Washington, 19/11/1956, Slovakia succeeded on 22/03/2005)
- **European Landscape Convention** (Florence, 20/10/2000, Slovakia succeeded on 01/12/2005)

Cross-sectional Conventions

- **UN ECE Convention on Environmental Impact Assessment in a transboundary context** (Espoo 25/02/1991, Slovakia succeeded on 17/02/2000)

  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, Slovakia succeeded on 11/07/2010)
- **Convention on Control of Transboundary Movement and Management of Hazardous Wastes and Their Disposal, so-called Basel Convention** (Basel, 22/03/1989, Slovakia succeeded on 24/07/1991)

  Supplement to the Basel Convention (New York 22/09/1995, Slovakia succeeded on 06/11/1998)
- **Convention on the transboundary effects of industrial accidents** (Helsinki, 17/03/1992, Slovakia succeeded on 08/12/2003)
- **Framework Convention on the Protection and Sustainable Use of the Carpathians - Carpathian Convention** (Kiev, 22/05/2003, Slovakia succeeded on 04/01/2006)
  - 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 (Kiev, 19/06/2008, Slovakia succeeded on 03/08/2011)
- **Convention on Access to information, public participation and access to justice in environmental matters – Aarhus Convention** (Aarhus, 25/06/1998, Slovakia succeeded on 05/3/2006)

  Changes and amendments to the Convention (Almaty, 27/05/2005)

  - Protocol on the register of release of polluting substances and their fluxes (PRTR Protocol) (Kiev, 21/05/2003, Slovakia succeeded on 08/10/2009)
- **Convention for the establishment of a European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)** (Geneva, 24/05/1983, Slovakia succeeded on 03/01/2006)

- **Protocol on the privileges and immunities of the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)** (Darmstadt, 05/06/1986, Slovakia succeeded on 23/02/2006)
- **Agreement between EURCONTROL and the MoE of the SR on the access to data contained in the Emission Trading Scheme Support Facility - ETS-SF** (2011)

ENVIRONMENTAL HISTORY, ARCHIVING AND INTELLIGENCE – TWENTY STATE OF THE ENVIRONMENT REPORT OF THE SLOVAK REPUBLIC

• A FINAL WORD FROM THE EDITOR AND CO-AUTHOR

Each person's right to information on the state of the environment and environmental care in Slovakia or other countries has existed only since recently. This right as well as the obligation of the State to publish environmental information together with causes and negative impacts on the state of the environment and its components, but also on health, age, and lifestyle of people and other organisms, have developed only after a number of catastrophes, especially after the reluctance to publish information on the impact of the accident at Chernobyl nuclear power plant of April 26, 1986. **Charter of Basic Rights and Freedoms** was adopted by the Federal Assembly of the Czech and Slovak Federative Republic as its constitutional act no. 23/1991 Coll. with article 35(2) stating: "All people are entitled to timely and complete information on the state of the environment and natural resources." This formulation was partly adopted by the **Constitution of the Slovak Republic** no. 460/1992 Coll. into its article 45 where it states: "all people are entitled to timely and complete information on the state of the environment and its causes and outcomes." Article 14 of **Act 17/1992 Coll. on the environment** provides this detailed wording of this provision: "Everyone shall be entitled to true and adequate information on the state and trend of the environment, causes and outcomes of this state, and information on planned activities that might lead to changes in the environment, and information on the measures taken by environmental protection authorities in preventing or remedying the environmental damage." While this provision was repealed by **Act 171/1998 Coll. on access to information on the environment** on May 14, 1998 with the effect as of September 1, 1998, this same legal provision follows up on the international legislation and pays more attention to the rights and obligations relative to the environmental information, archiving and intelligence. Its article 16 on the report on the state of the environment states:

1) Ministry shall, for each year, publish a report on the state of the environment of the Slovak Republic. To that end, pertinent central administration authorities of the Slovak Republic shall furnish background information to the Ministry.
2) Ministry shall publish the Report under paragraph 1 not later than by December 15 of the following year. Pertinent central authorities shall furnish the background documentation to the Ministry not later than by August 31 of the following year.
3) The report, under paragraph 1, shall be published at the Ministry, the Inspection, as well as at regional and district offices.

Act 171/1998 Coll. was repealed as of January 1, 2001 by **Act 211/2000 Coll. on free access to information and on amendment and supplementation of certain laws.** Act 17/1992 Coll. superseded this act on free access to information on the environment through adding article 33b that

contains an updated wording of the original provisions of article 16 of Act 171/1998 Coll. Pursuant to art. 33b of Act 17/1992 Coll., the Slovak Ministry of Environment has still been publishing **reports on the state of the environment in the Slovak Republic** for the preceding year. By doing this, the Slovak Ministry of Environment complies with the Directive of the European Parliament and of the Council 2003/4/EC of January 28, 2003 on public access to environmental information and repealing Council Directive 90/313/EEC. (EU Bulletin L 041, 14.2.2003). This repealed Directive of June 7, 1990 on free access to information on the environment (Bulletin L 158, 23/06/1990) reads in art. 7 the following: "Member States shall take the necessary measures to ensure that public authorities organise the environmental information which is relevant to their functions and which is held by or for them, with a view to its active and systematic dissemination to the public." The Directive effective as of 2003 further states in its article 7(3) that reports are to be released at all levels, with the following wording: "Without prejudice to any specific reporting obligations laid down by Community legislation, Member States shall take the necessary measures to ensure that national, and, where appropriate, regional or local reports on the state of the environment are published at regular intervals not exceeding four years; such reports shall include information on the quality of, and pressures on, the environment." Structure of information about the environment also in the written form is further specified in art. 2(1) of this Directive and we try to comply with this provision by publishing our reports. Regional and also local environment reports in Slovakia have not yet been produced and published in Slovakia. Pursuant to the quoted laws, European directives, and the Aarhus Convention, Slovakia publishes only its national report. However, the report contains not only sectoral, but also regional aspects of the environmental assessment. (e.g. under the environmental regional classification within the so-called loaded areas) To provide the full picture, the mentioned EEC UN Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (adopted in the Danish Aarhus on 25/06/1998 and effective in Slovakia as of 30/10/2000 until 31/10/2005) in its article 5(4) states: "Each Party shall, at regular intervals not exceeding three or four years, publish and disseminate a national report on the state of the environment, including information on the quality of the environment and information on pressures on the environment." To do this, also the European Union publishes voluminous factographic reports (The European Environment; Environment in the European Union; Europe´s Environment) currently published through the European Environment Agency (EEA) in Copenhagen. Participation of Slovakia in the EEA and the European environmental information and monitoring network is address by a special treaty between Slovakia and the EU ratified by the President on January 18, 2001 and coming into effect on August 1, 2001. (Notification of the MFA SR no. 266/2002 Coll.). Slovak Environment Agency was commissioned by the national EIONET centre to be responsible for building and operation of the Environmental information system in Slovakia. Similar reports on the environment have been published also by the UN Environmental programme in Nairobi (UNEP Global Environment Outlook; Environmental Data Report) and the OECD in Paris that publishes reports on the environmental performance of each of its member states every ten years. (in the years 2002 and 2011 also for the Slovak Republic) Partial reports addressing the environmental matters have also been published by the WHO, FAO, WMO, UNESCO, WRI, and other relevant international government and non-government organisations. (e.g.

IUCN) As of date, the Slovak Environment Agency in cooperation with other involved central government agencies and professional institutions published 20 annual reports on the state of the environment and one special quinquennial report called "Environment of the Slovak Republic in the years 2002-2006". In total, the report encompasses an impressive number of 4 996 A4 pages, not including the printed English translations from the years 1997 and 1998. (subsequent shortened English versions were published only on a CD) With them, the published volume was 31 600 copies and has been decreasing in size ever since. (the maximum number of copies was in 1997 and 1998 during the EU accession process) The first report for the years 1992-1993 (520 pages) was the most extensive one, including also the historical trend. The briefest report was for the year 1997 (156 pages). The reports have shown 4 090 tables that accompany the text (most of them published in the report from 2008, specifically 304), 3 301 charts (of these most - 264 were published in 2007), 517 maps (most of them in the first report, 62). Besides this, the reports contain also schemes and drawings. (more than 32 - in the first report), as well as different symbols and logos. As to date, forewords to the reports have been written by 7 Ministers of the Environment of the Slovak Republic. Ministry of Environment's Unit of Environmental Strategies, Law, and Organisation (SEKPO) drafted the first report. Its general director involved also the Slovak Environment Agency established in 1993 to take part in the preparation of other reports. (J. Klinda - Z. Lieskovská have been involved since the period of the years 1994-1995) Contents of the reports have been gradually revised so as to include also the majority of the environmental science sectors, along with the existing components of the environment and their causes and consequences, and physical, chemical and biological factors. From the regional perspective, each report characterised the state of the regions by the outcomes of on-going revisions to the environmental regional classification supervised by the Slovak Environment Agency´s office in Košice. The reports also described the environmental situation existing in urban and rural environments on the basis of documents supplied by the SEA offices in Žilina and Banská Bystrica. Each report included also the related background documents supplied by the sections of the Ministry of Environment, Ministry of Agriculture and Rural Development, Ministry of Economy, Ministry of Health, Ministry of Interior, Ministry of Transport, construction and regional development, Ministry of Culture - especially its Monument Board, Nuclear Regulatory Authority, Statistical Office of the Slovak Republic, as well as various professional sectoral and external institutions, that are to be thanked for a long and unselfish cooperation. Special thanks go to the SEA editor, Ing. Zuzana Lieskovská and her team, as well as to dozens of professionals from various sectors of environmental sciences. The reports built on their contributions, even if in some cases their input would be a single summary table or a single chart that was the result of hundreds of prior measurements, analyses, and other creative activities. Were it not for the outcomes of their environmental monitoring and information science, it would have been exceedingly difficult for the reports to encompass such a big volume of factual data and evaluations. This system was introduced and put in operation especially by the Strategy of Environmental Monitoring for the Slovak territory, and the Strategy of Integrated Information System on the Environment of the Slovak Republic (SR Government Resolution of 26th May 1992 no. 449), SR Government Resolution of 7th September 1993 no. 620 to the Proposal to implement the Environmental Monitoring System and the Integrated Information Environmental system of the Slovak

Republic, Strategy of completion of the comprehensive monitoring and information system in the environment (SR Government Resolution of 12th January 2000 no. 7) as well as other cross-sectional and partial documents of the State environmental strategy (e.g. Policies, principles and priorities of the State environmental strategy of 1993 and the follow-up national environmental action programmes of 1996, 1999, and 2003) summarily published in the new **Concept of Environmental Strategy for the years 2014-2020** approved on 28th March 2013) under the name Orientation, principles, priorities and major tasks of environmental conservation of the Slovak Republic for the years 2014-2020.

The gaps existing between texts, tables, charts, maps, and schemes found in each report are filled with figures that characterise sectoral and regional aspects of the environmental science. The total number of 2,443 figures (most of them - 193, published in 2009) form together a gallery that depicts the state of the environment and the environmental science from the region of Záhorie to Zemplín, from the Tatras to the Danube River, from the Gerlach peak to the bottom of the Slovak caves. It encompasses the whole spectrum of organic and inorganic nature influenced by the elements of human creation as pictured on the reports´s cover pages. Besides, they also illustrate various international and national environmental events and persons (political, scientific, cultural, production, ...) positive and negative phenomena and objects within landscape, outcomes of projects, major environmental situations (floods, fires, calamities, accidents, ...), various ecosystem services and their benefits, samples of environmental books and magazines (Životné prostredie, Enviromagazín, ...), creative environmental activities of the Central Government authorities and organisations, as well as schools and non-government organisations (e.g. Grenpeace, Friends of the Earth, Bratislava-based Protection Association, Špirála, ...). Present are also samples of different species of invertebrates, vertebrates, plants, fungi, and lichens, primaeval forests and standalone trees in de-forested landscapes, ruined and restored cultural monuments (e.g. Krásna Hôrka castle before its burn-out), building of different facilities of the environmental infrastructure, declaration of world heritage sites, awarding the Minister of Environment's awards, Envirofilm, TOP, Village of the Year, or Enersol, with examples of renewable energy sources. All regional cities were presented together with a number of district cities and villages. Also, presented were all national parks and protected landscape areas, accessible caves and geo-parks, town reserves and a number of monument reserves of the folk architecture, along with modern and folklore features in our environment. Just like the other parts of the reports, the figures also depict trends in the environment and the environmental science in Slovakia over the last twenty years. These present also older unique photographs (e.g. the oldest photography dating back to 1913 depicts today's building of the Slovak Ministry of Environment on the Square of Ľ. Štúr in Bratislava). However, it is the Slovak Museum of Nature Conservation and Caves in Liptovský Mikuláš that can find inside the reports a plethora of material to make comparisons, analyses, assessments, and presentations of the mentioned development in Slovakia and should generally deal with this issue. The Reports represent a significant archiving document of the environmental safety, feasibility, usability, and aesthetics. Besides, it is also a tool for environmental education. Over the whole reported period, a number of universities, high schools and elementary schools, including libraries, promotion and education centres, information centres, as well as villages, companies, scientific institutes and citizens interest groups showed interest in the initiative. The

Reports became the learning tool and the documentation to be used and quoted in student, professional, and scientific papers.

They have been both, the lesson and the memento of the Slovak environment about not hiding the negatives. They thus became a mirror of our country and of the implemented good and bad actions impacting the country and its inhabitants over more than twenty years.

RNDr. Jozef Klinda

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
EVP	Environment-friendly product
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
INES	International Nuclear Events Scala
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
NPP	Nuclear Power Plant
NR	Nature Reserve
NRA SR	Nuclear Regulatory Autority of the SR
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
PES	Primary energy sources
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
RES	Renewable sources
RPHA	Regional Public Health Authority
SCI	Sites of Community Importance
SE, Inc.	Slovak Energy, Inc.
SEA	Slovak Environmental Agency
SIA	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
VRP	Village Renewal Programme
VU	Vulnerable Taxon
WEEE	Waste from Electrical and Electronic Equipment
WRI	Water Researcher Institute
WH	World Heritage
WWTP	Waste Water Treatment Plants

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