

***Ministry of Environment
of the Slovak Republic***



***STATE OF THE
ENVIRONMENT REPORT
SLOVAK REPUBLIC
2010***



Slovak Environmental Agency

STATE OF THE ENVIRONMENT - CAUSES AND CONSEQUENCES

• ECONOMIC SECTORS AND THEIR IMPACT ON ENVIRONMENT

Key questions and key findings

◆ Key questions

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

◆ Key findings

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

- 20% for the area of transport. Total energy consumption in transport has increased by 60%, compared to 2000.
- In 2010, total electricity production was 27,720 GWh. Compared 2009, it has grown by 6%. Power plants showed the greatest share on production - 50.7%, hydroelectric power plants - 19.1%, and thermal power plants - 17.5%. The rest goes to the other sources. Production of electricity from renewable sources (RES) has been growing, the share of electricity produced from RES was 18.8% from RES.
 - Modal split in passenger transport in 2010 dropped in total. It also dropped, specifically, in aquatic transport, as well as in individual transport types. Modal split in freight transport in 2010 grew in total. The same trend has been recorded in railway and aquatic transport. From the long-term perspective - comparison of the situation in 2000 and 2010, modal split in passenger transport grew only in air transport, while for freight transport it grew specifically in the road and aquatic transport. The negative trend in carried passengers in municipal mass public transport continues over a long term. Number of vehicles in road transport has been growing over a longer time horizon. In 2010, compared to 1998, the number of vehicles grew by 39%.
 - In terms of transport share on total emissions of assessed pollutants for 2009, significant is transport share on CO emissions – 29 %, 50% in case of NOx, and 13% in case of NM VOC. In 2009, transport contributed to total PM emissions by 13%, while it contributed to SO2 emissions by 0.37%. Share of transport on heavy metal emissions is app. 8.4%. Volumes of CO2 emissions from transport dropped by 7.2% on a year-to-year basis; however, they grew by 32.6% as of 2000. Noise has an annoying effect and may pose health risks when its intensity is increased. Limit values for noise load on the population are exceeded in a number of areas in Slovakia. In 2010, 13,749 m of noise wall barriers were built in the road transport, while 8,517 m of them were built in the railway transport.
 - Consumption of industrial fertilisers in agricultural produce in 2010 dropped by 9.3 kg of net nutrients per ha in comparison to 2009. Over a longer time period, this consumption grew in 2010, compared to 2000, by approximately 2%. Pesticide consumption in 2010 increased by 990 tonnes, compared to 2009. Over a longer time period, this consumption grew in 2010, compared to 2000, by approximately 32%.
 - >From a long-term perspective (2000 - 2010) there has been reduction in the impact of agriculture on the environment - reduced number of surface water abstraction rate by app. 93.6%, ground water abstraction rate dropped by 31.1%, and contamination by waste water from agriculture decreased by 30.3% in comparison of the years 2004 - 2010, with a change in methodology in 2003. Reduction in individual greenhouse gases emissions from agriculture shows a long-term trend. Greenhouse gases emissions over the horizon of 2000 - 2009 have remained roughly at the same level with slight fluctuations in individual years, with their reduction by 12.3% in 2000; methane (CH4) emissions dropped by 21%, nitrous oxide (N2O) emissions dropped by 7.3%, and ammonia emissions (NH3) by 22%. In 2010, compared to 2005, the number of waste generated in agriculture dropped by 26.4%.
 - In 2010, the size of agricultural land within the system of ecological agriculture reached 9.27% of total agricultural land size. Thus, Slovakia reached its objective set at the 7% share.
 - Forest ownership structure is changing only slightly, since as to date the process of settling the ownership rights and the use of forest pursuant to the legislation on restitution of property (6.7% of non-identified forestland on total forest land size) has not been completed. Forest land size in Slovakia has been stable. Over a long-term period, the size has been increasing and is currently 41% of total size of the country. Increase in the proportion of natural regeneration (since 2000 it has grown more than three times and now is 39.1%) is seen as a positive trend for carrying out sustainable forest management. Spatial representation of broad-leaf trees is 60.2% with the greatest share of beech (31.8%) and oak (13.2%), and coniferous trees (39.8%) with the greatest share of spruce (25.3%), which gradually leads to reaching the target wood composition. There has been a positive trend also in spatial representation of age degrees, although the actual age composition of forests somewhat differs from their normal (theoretical) age composition. Forest condition in Slovakia has been stabilised over the recent years; however, it is still considered adverse (38% of damaged trees as of 2010), which is a worse situation than the European average. Most damaged tree

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

- Stores of growing stock in Slovak forests has been gradually rising, reaching 462 mil.m³ of barkless wood matter, with average stock per hectare increased by 11.2% to 239 m³. Timber felling shows a long-term rising tendency, is has been growing continually since 2000 from 6.2 mil.m³ up to 9.2 mil.m³ in 2010. Nevertheless, trend in the timber felling has been impacted by a long-term occurrence of incidental felling that represents 35 to 65%. Forest utilisation (share of felling volumes on wood increment) in Slovakia can be assessed as sustainable. In 2010 it was 82.5%. However, harvested volumes should not exceed 60% of the wood increment volume.

Industry

◆ Share of manufacturing in GDP generation

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

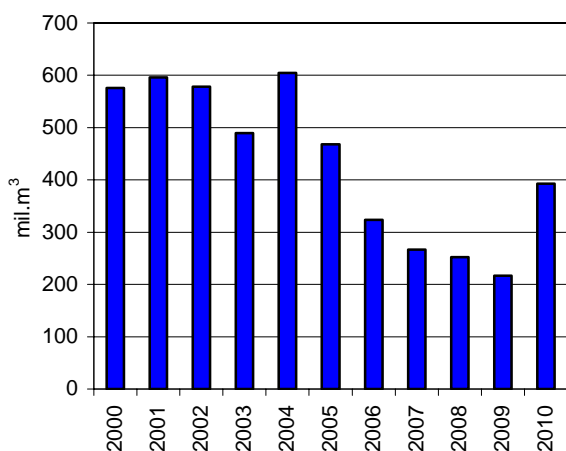
Share of industry on the production of GDP in 2010 reached 30.6%, dropping by 0.7% when compared with the previous year (in 2000, the share of industry of the production of GDP was 26%). **Industrial Production Index** in 2010 grew by 18.9%, compared to the previous year.

◆ Demand of industrial production on the exploitation of resources

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

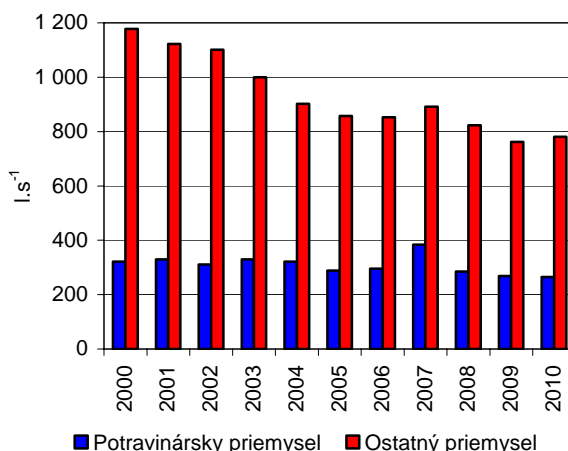
Surface water abstraction by industry shows a fluctuating trend. In 2010, compared with the year 2000, surface water abstraction by industry dropped by 31.8%. In the same year, industry's share on total abstracted volume was 87.9%. Trend in **groundwater abstraction** by industry shows a decreasing tendency.

Development in consumption of surface water in industry



Source: SHMI

Advancement in underground water consumption in industry

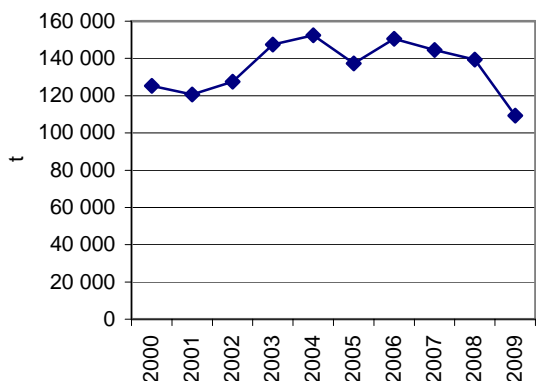


Source: SHMI

◆ **Impact of industrial production on environment**

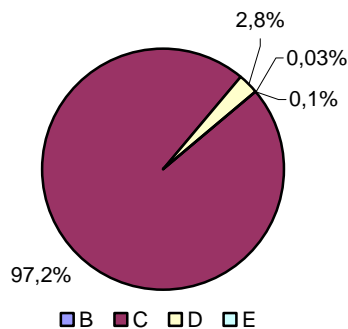
CO emissions from industry in 2009 made up as much as 98.6% of large-size and middle-size stationary sources, and emissions **decreased** by 12.6%, compared to 2000.

CO emissions trend from stationary industrial sources



Source: SHMI

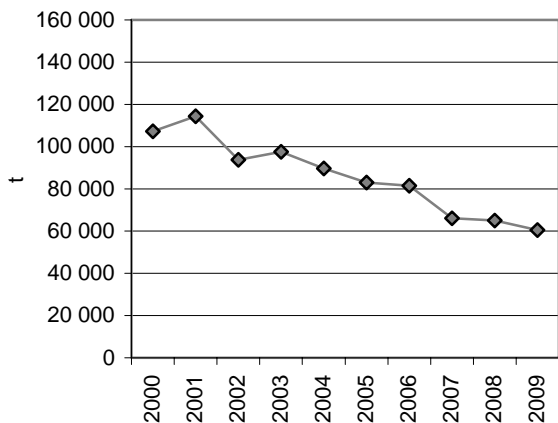
Share of CO emissions from stationary industrial sources on the overall CO emissions in 2009



Source: SHMI

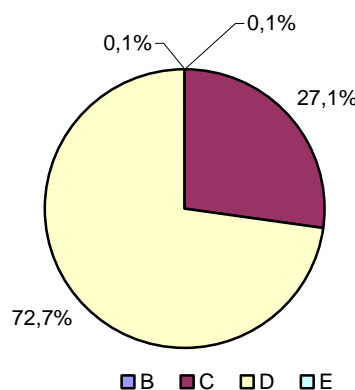
SO₂ emissions from industry in 2009 made up as much as 99.5% of large-size and middle-size stationary sources, and emissions **decreased** by 43.6%, compared to 2000.

SO₂ emissions trend from stationary industrial sources



Source: SHMI

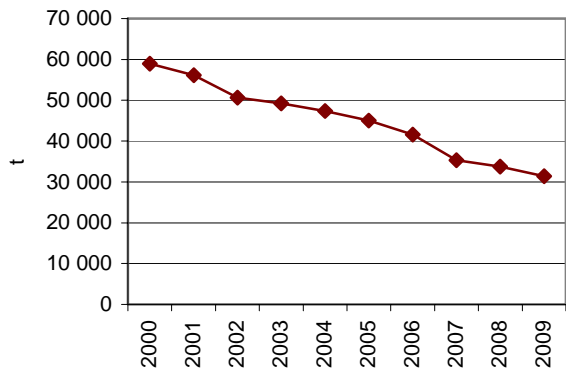
Share of the SO₂ emissions from stationary industrial sources on the overall SO₂ emissions in 2009



Source: SHMI

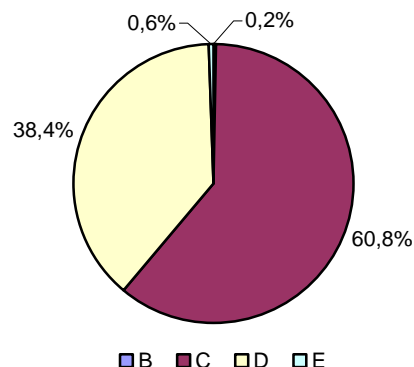
NO_x emissions from industry in 2009 made up as much as 90.4% of large-size and middle-size stationary sources, and emissions **decreased** by 46.8%, compared to 2000.

NO_x emissions trend from stationary industrial sources



Source: SHMI

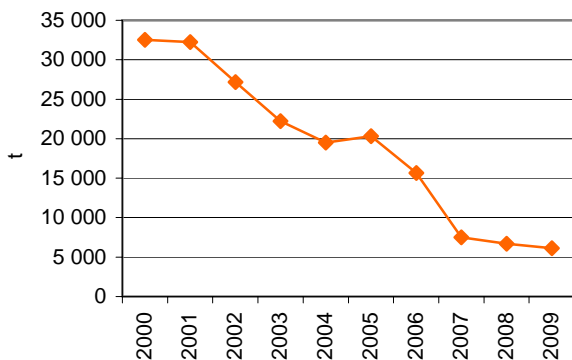
Share of the NO_x emissions from stationary industrial sources on the overall SO₂ emissions in 2009



Source: SHMI

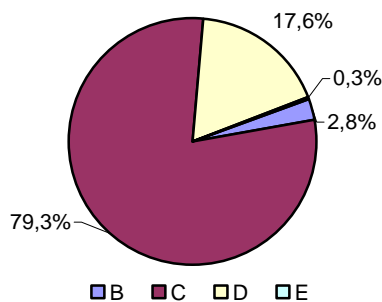
SPM emissions from industry in 2009 made up as much as 93.7% of large-size and middle-size stationary sources, and emissions **decreased** by 81.2%, compared to 2000.

SPM emission trend from stationary industrial sources



Source: SHMI

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



Source: SHMI

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

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

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

Extraction of minerals

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

Trend in extraction of minerals, 2001-2008

Extracted mineral	Measure unit	2001	2002	2003	2004	2005	2006	2007	2008
Brown coal and lignite	kt	3 761.9	3 661.2	3 508.8	3 101.7	2 513.0	2 208.6	1 851.56	2 242.82
Crude oil, including gasoline	kt	54.085	51.770	47.943	42.082	33.15	30.5	24.49	20.8
Natural gas	thous. m ³	195 938	200 812	186 797	178 088	150 851	136 881	500 550	111 823
Ores	kt	1 047.5	719.2	706.5	977.8	651.89	741.9	666.57	479.14
Magnesite	kt	1 573.0	1 464.5	1 640.9	1 668.9	1 555.0	1 467.8	1503.60	1 438.50
Salt	kt	104.0	102.7	104.8	104.3	105.1	122.5	116.76	99.31
Building stone	thous. m ³	3 881.6	4 478.3	4 503.3	4 527.5	6 016.2	6 309.2	6 528.40	7 789.10
Gravel sands and sands	thous. m ³	2 689.4	2 933.1	3 872.7	3 951.7	4 870.1	5 502.9	5 113.50	6 979.40
Brick clay	thous. m ³	442.1	433.4	507.4	591.7	466.8	508.0	1 011.70	512.74
Limestone and cement raw materials	thous. m ³	302.3	332.7	384.9	569.5	690.6	673.5	627.10	757.40
	kt	1 614.6	1 547.4	1 649.4	3 479.8	3 743.3	4 131.2	4 107.80	1 831.50
Limestone for special purposes	thous. m ³	292.3	833.0	941.4	14.9	28.50	67.0	90.30	136.10
	kt	325.0	0.0	0.0	1 057.5	834.80	1 243.6	1 175.70	862.50
High-content limestone	kt	4 211.1	4 356.8	4 093.0	3 767.3	4 053.5	4 393.0	4 362.00	4 035.00
Other raw materials	thous. m ³ surface	1 026.9	1 216.8	1337.2	567.8	509.1	531.6	476.50	490.71
	kt under-ground	142.3	86.4	86.2	91.6	106.5	115.3	139.40	140.60
	kt surface	32.30	31.1	11.8	1 143.9	1 024.0	1 279.3	1 457.45	931.80

Source: MMO SR

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

Crude oil, gasoline, and natural gas extraction were decreased, compared to the previous year. Total extracted volumes included 18 150 t of semi-paraffin crude oil, and 2 652 t of gasoline. Natural gas stores were decreased by 111 823 thous. m³.

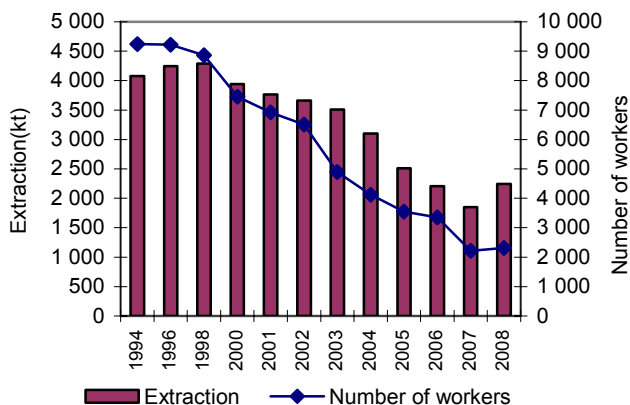
Exploitation of **ore minerals** decreased. The Siderit, Ltd. company in Nižná Slaná has the biggest share on all ore volumes, (443.8 kt). The Slovenská banská Ltd. company in Hodruša Hámre was contributed by 14.74 kt.

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

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

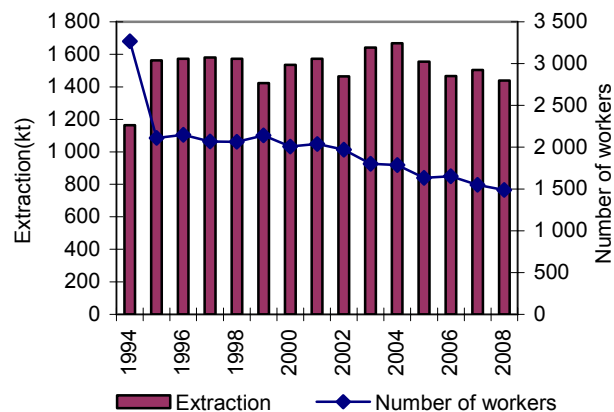
Basic indicators of mineral extraction trend in SR between the years 1991-2008

Trend in brown coal and lignite extraction



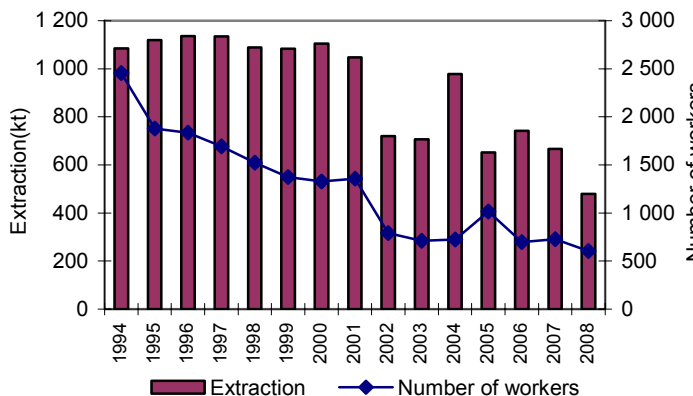
Source: MMO SR

Trend in magnesite extraction



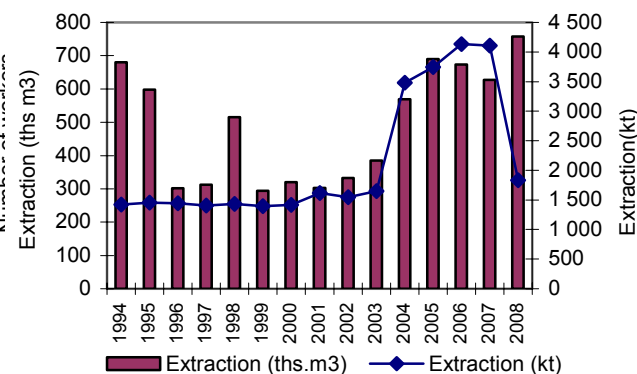
Source: MMO SR

Trend in ores extraction



Source: MMO SR

Trend in limestone and cement materials extraction



Source: MMO SR

◆ **Environmental impact of mineral exploitation**

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

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

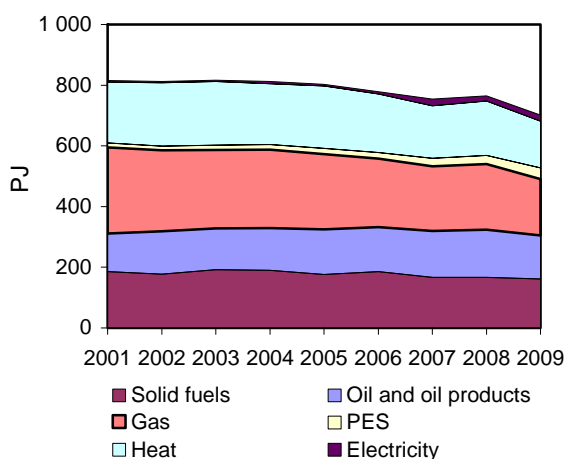
Power engineering, Heat production and Gas management

◆ Energy sources balance

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

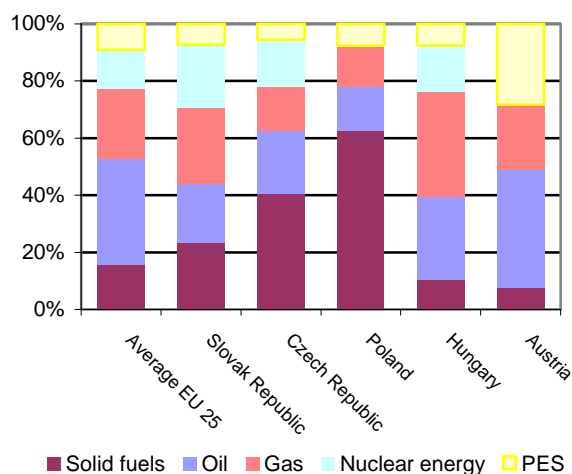
Structure of the used PES in Slovakia since 2001 has been characteristic for its increased consumption of renewable energy sources at the expense of the consumption of other fuel types. Utilisation of nuclear fuels in recent years plays an exceptionally significant role in the PES structure of the SR.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

Trend in used primary energy sources in the SR



Source: SO SR

Structure of primary energy sources in 2009 – international comparison

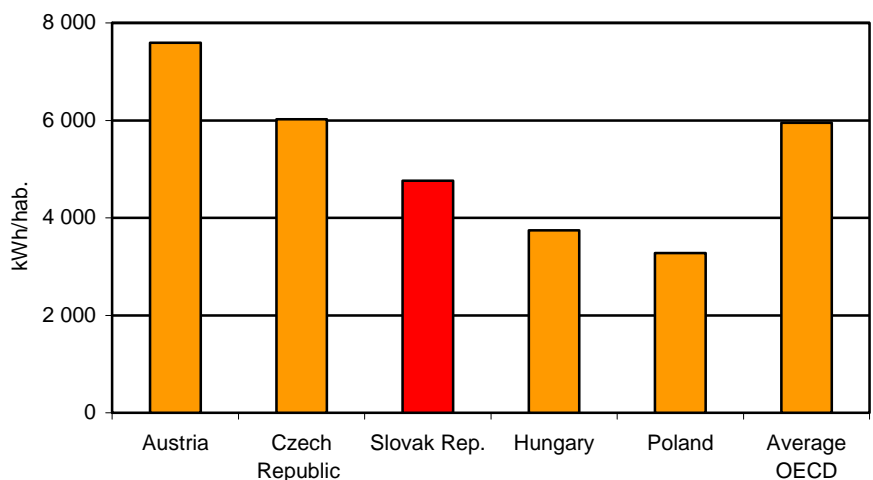


Source: Eurostat

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

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

Electricity consumption per capita in 2009 - international comparison

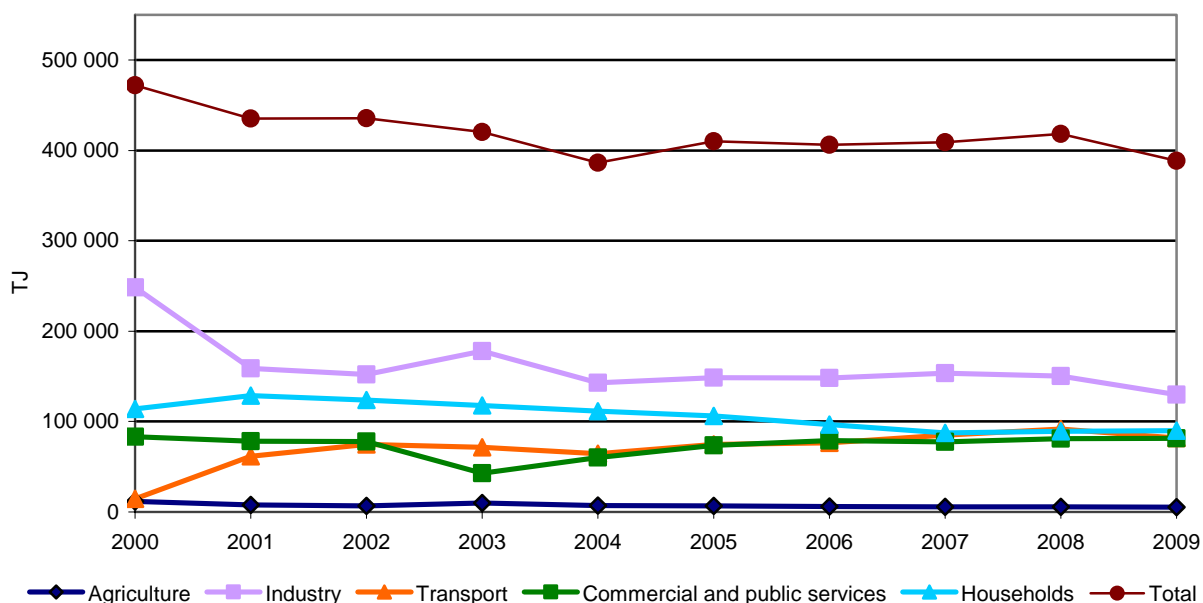


Source: IEA

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

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

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



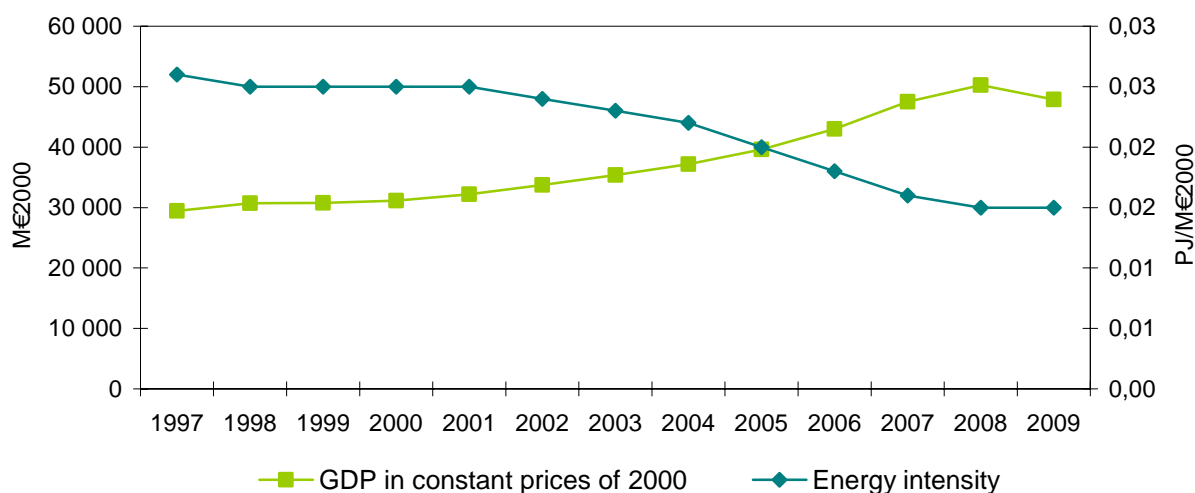
Source: SO SR

◆ Energy intensity

Energy intensity (EI) is an important economic indicator also used to make international comparisons. It is defined as the share of the gross energy inland consumption (GEIC) on the generated GDP ($GEIC/GDP=EI$). Over the recent years, the GDP growth was accompanied by a balanced consumption of energy sources and a drop in the final energy consumption. Since 1997, energy intensity has been decreasing every year by 4%, caused mainly by more development in the value added production, as well as by introduction of rationalization measures in production and consumption alike.

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

Trend in energy intensity and GDP in SR



Source: SO SR

◆ Electricity power management

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

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

◆ Gas management

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

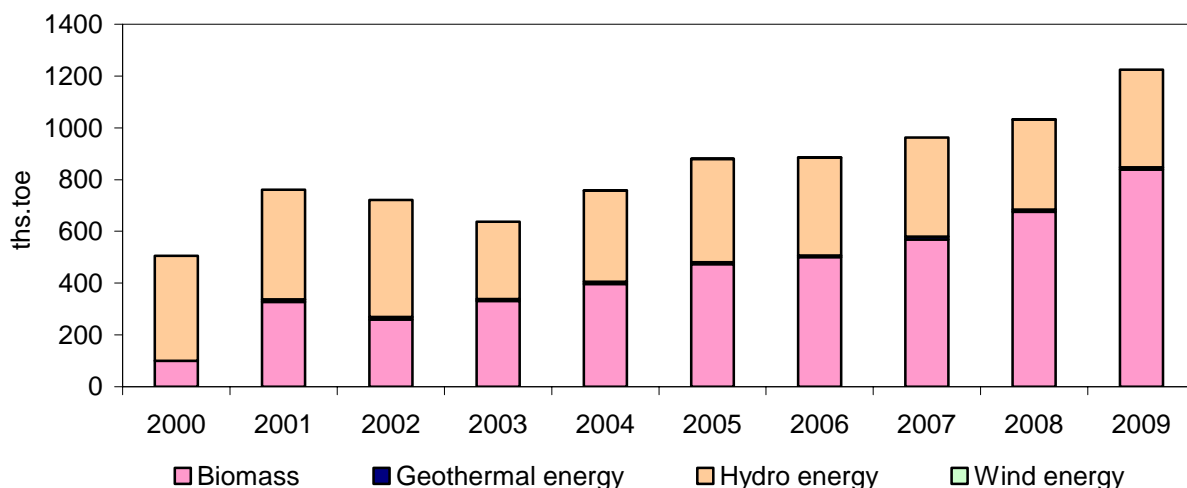
purchased for the purposes of domestic supply in 2010 was 4.95 bill.m³ (52 529 GWh). The major part of natural gas has been imported from the Russian Federation.

◆ Renewable energy sources (RES)

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

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

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

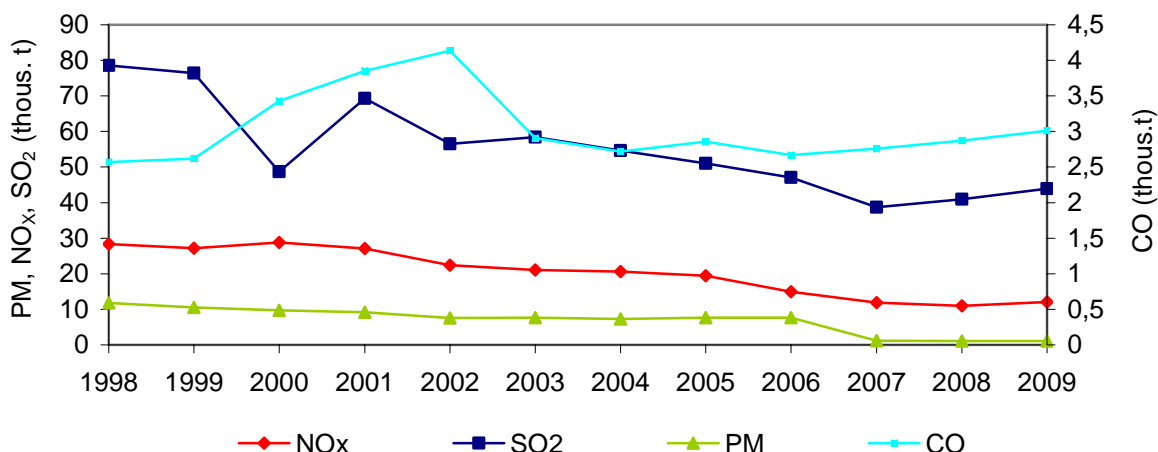


Source: Eurostat

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

Energy production and consumption is accompanied by the **production of basic pollutants**. Until 2007, sulphur oxides (SO₂), nitrogen (NO_x), and particulate matter (PM) emissions were reduced significantly. This situation was caused by decreased production and consumption of energy and a shift in the fuel base toward more purified fuels, as well as by using fuels with better quality characteristics. However, **since 2007** SO₂ emissions grew by 12%. CO emissions also began to rise (compared 2007 they increased by 9%), with the nitrogen oxides rising very slowly. PM emissions have not changed since 2009.

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

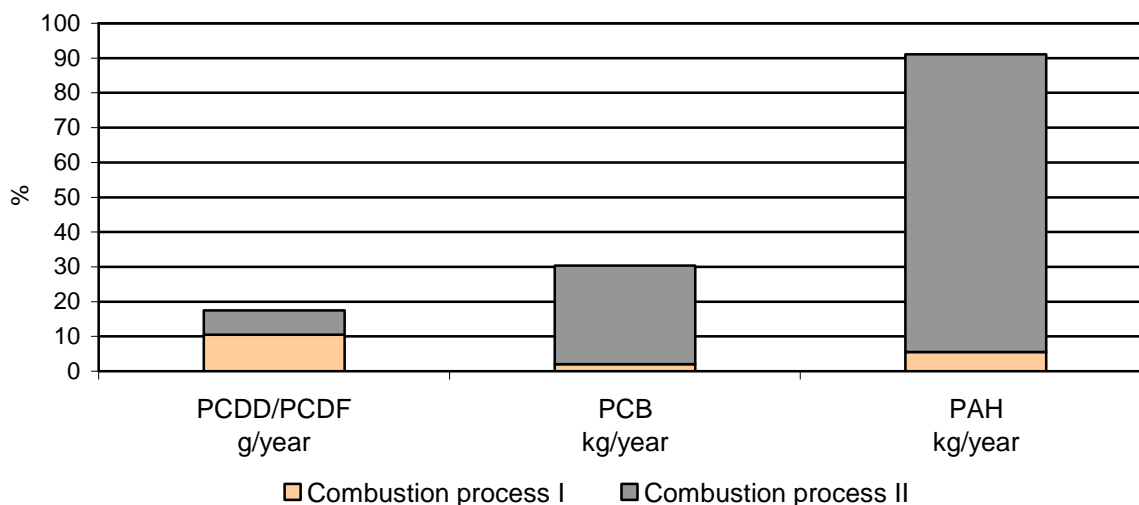


Source: SHMI

Power engineering shows the greatest share by **greenhouse gases emissions** that in 2009 (including transport with the share of 21.6%) represented 66.1% (28 694.32 Gg of CO₂) of total greenhouse gases emissions in Slovakia. The year-to-year reduction compared to 2008 has been 8.4%. Significant reduction in 2009 was caused by the consequences of the global financial crisis in 2008 and the subsequent economic recession in 2009 that impacted mostly the power industry and industrial production.

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

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



Source: SHMI

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

Of all areas within the energy sector, electricity power management contributed the most to total volumes of **discharged waste water**. Waste water produced by electric power plants mainly includes water from technological and cooling processes, and also some run-off water. Waste water from technologies is chemically contaminated. In case of nuclear power plants, water from the primary cycle also shows a degree of radio-chemical contamination. Water used as a coolant shows mostly thermal contamination. Compared to 2009, volumes of **discharged water** from the heating industry grew by app. 5.5%.

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

Waste water from electricity production	Volume (thousand m ³ .y ⁻¹)	IS (t.y ⁻¹)	BOD ₅ (t.y ⁻¹)	COD _{Cr} (t.y ⁻¹)	ENP _{uv} (t.y ⁻¹)
Treated	14 459.964	179.520	23.577	183.542	0.795
Untreated	9 908.049	75.624	3.338	18.851	0.331
Subtotal	24 368.013	255.144	26.915	202.393	1.126
Waste water from heat production					
Treated	1 090.033	16.453	1.804	23.242	0.175
Untreated	1 098.305	2.339	0.000	1.770	0.011
Subtotal	2 188.338	18.792	1.804	25.012	0

Source: SHMI

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

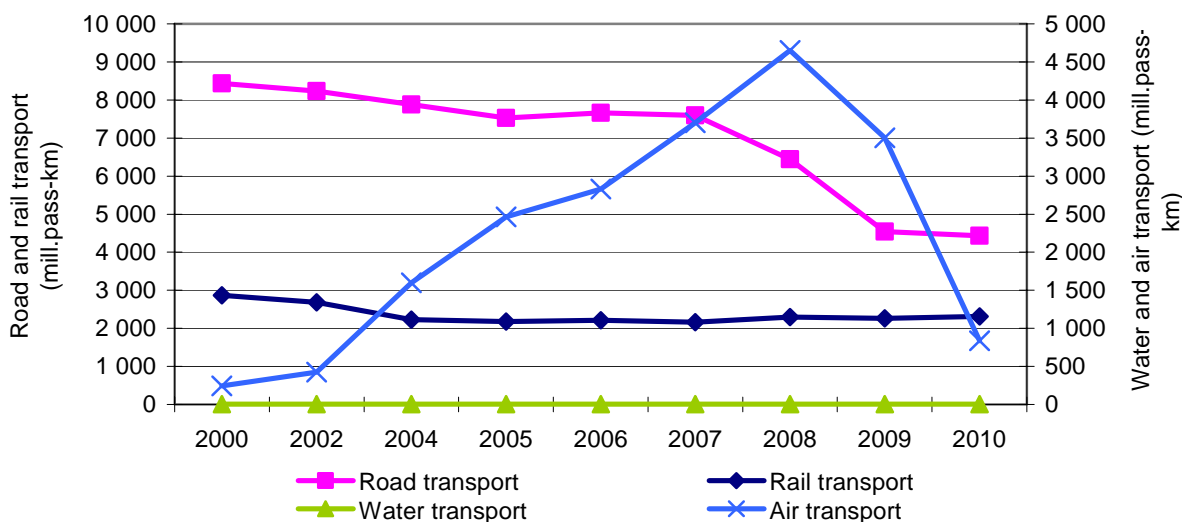
Transport

◆ Passenger and freight transport

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

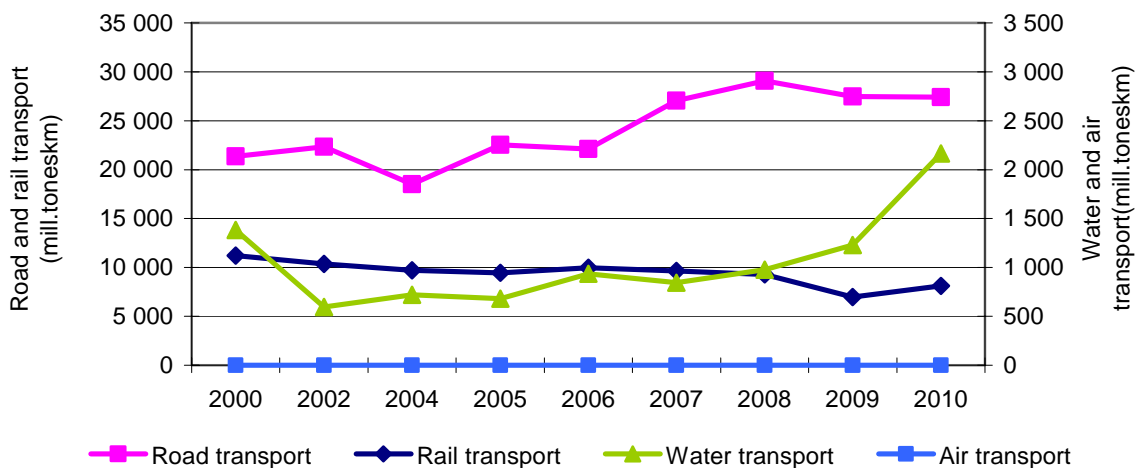
Freight transport and **modal split** in 2010 increased in 2010 for railway, water, and air transport. Road freight modal split in 2010 dropped by more than 12%, compared to 2009. A significant growth has been seen in the railway freight transport (16.4%) and water freight transport (76.1%). Air cargo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

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



Source: SO SR

Freight transport demand by mode (mil. tkm)



Source: SO SR

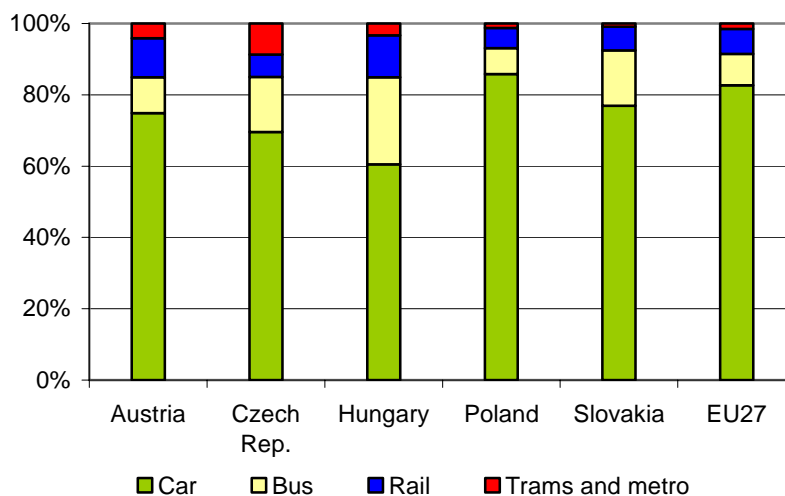
City transport enterprises of Bratislava, Košice, Prešov, and Žilina operate the municipal mass passenger transport (MHD). In 2010, lingered decreasing in the number of carried passenger. Over the period of 17 years (1993-2010), there was reported a 23.8% decrease in the number of carried passengers. Buss transportation has over the monitored time period been the major player in passenger transport, followed by tram and trolley buss transportation.

Indicators of city transport

Indicator	2001	2003	2005	2006	2007	2008	2009	2010
Total number of transported passengers (ths.)	373 269	394 465	395 064	400 673	403 466	399 425	389 263	385 594
Trams								
Transported passengers (ths.)	98 719	104 560	109 101	109 836	109 705	107 080	100 871	97 739
Seat kilometres (mil. km)	1 866	1 764	1 822	1 797	1 792	1 788	1 793	1 782
Trolleybuses								
Transported passengers (ths.)	53 167	59 034	58 032	59 071	60 655	62 038	62 745	62 236
Seat (mil. km)	1 008	1 110	1 075	1 085	1 104	1 099	1 111	1 125
Buses								
Transported passengers (ths.)	221 383	230 871	227 931	231 766	233 106	230 307	225 647	225 619
Seat (mil. km)	3 996	3 899	3 846	3 823	3 839	3 826	3 980	4 202

Source: SO SR

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



Source: Eurostat

◆ Number of vehicles

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

Number of motor-vehicles by individual types (pcs)

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

Source: ŠO SR

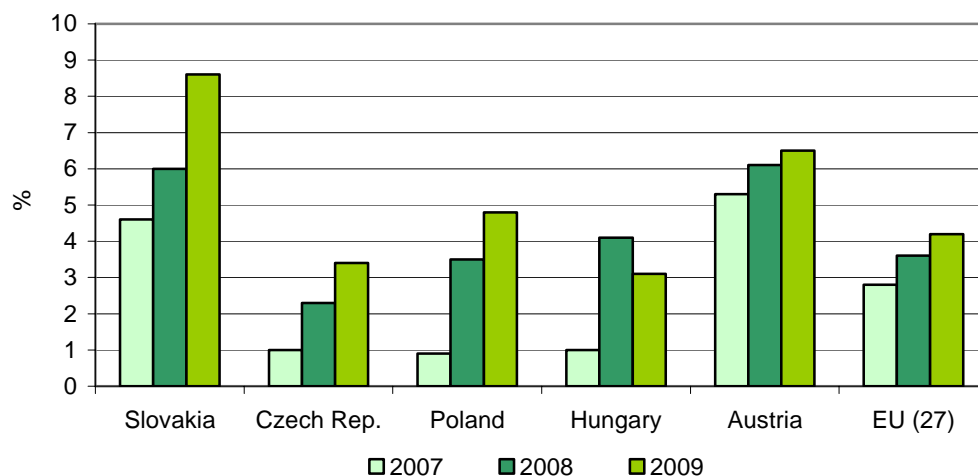
◆ Transport infrastructure

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

◆ Demand of transport on the utilisation of resources

Final energy consumption in the transport sector over the period of 15 years has more than doubled itself. Overall consumption of liquid fuels (97%) represents the greatest share of energy consumption in the transport sector on the overall energy consumption, while the share of solid fuels, gaseous fuels and electricity overall consumption remains small. Road transport shows the greatest share on the overall energy consumption in the transport sector (95%). On the contrary, proportion of the end electricity consumption in the sector of transport is by the railway transport (95%), while the end consumption of liquid fuels shows small proportion of the railway transport.

Share renewable energy in fuel consumption of transport



Source: Eurostat

◆ Impact of transport on environment

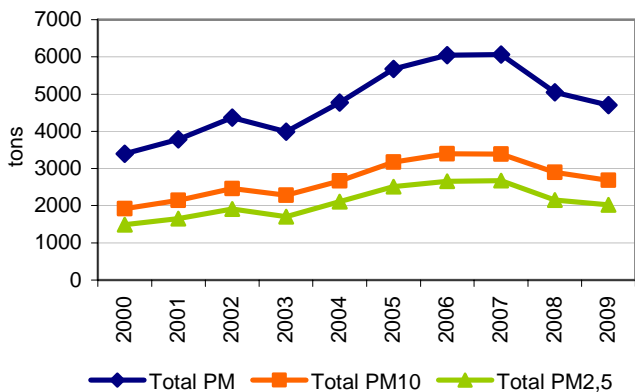
The CORINAIR methodology has been used to determine production volumes of individual monitored harmful substances in the EU countries. Its unique programme product called COPERT is designated to assess and evaluate the annual emission production from road transport. Basic pollutants emissions from transport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

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

Year	Annual production of the main air pollutants (ths. t)				
	CO	NO _x	NM VOC	SO ₂	PM
2000	117.130	36.550	15.730	0.860	3.775
2001	133.580	39.720	17.310	0.860	4.092
2002	124.770	40.130	15.720	0.800	4.646
2003	110.450	37.310	13.940	0.210	6.092
2004	106.220	42.170	13.770	0.220	5.192
2005	98.680	47.840	13.480	0.240	6.145
2006	83.890	43.720	10.660	0.240	6.547
2007	65.020	48.950	10.120	0.250	6.539
2008	63.520	48.500	9.930	0.260	5.018
2009	60.156	42.886	8.670	0.236	4.996

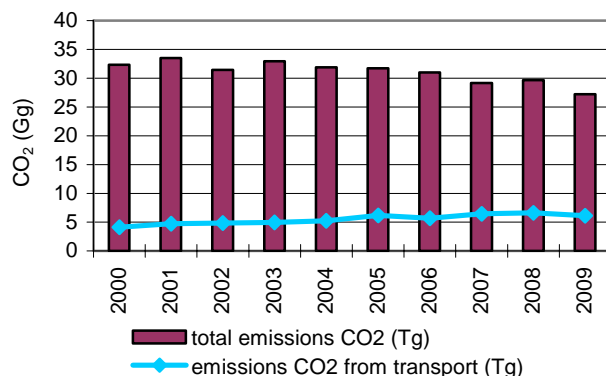
Source: SHMI

Emissions of total PM, PM₁₀ a PM_{2,5} from road transport in years 2000-2009 (t/year)



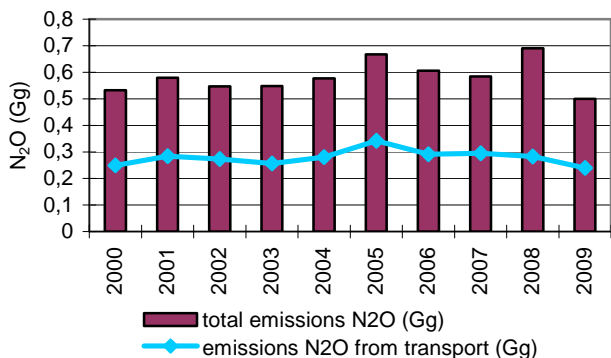
Source: SHMI

Trend in the greenhouse gas emissions - CO₂ from traffic operations compared to total CO₂ emissions in Slovakia (Tg)



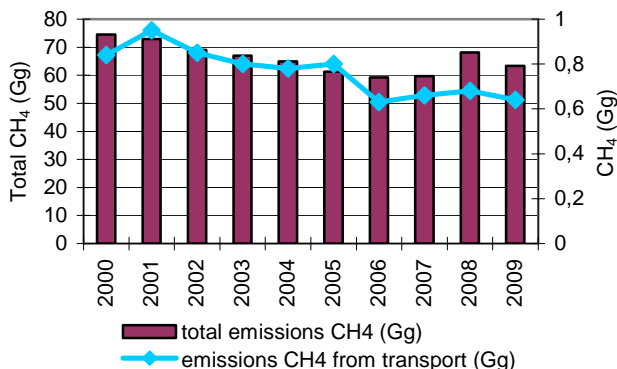
Source: SHMI

Trend in the greenhouse gas emissions - N₂O from traffic operations compared to total N₂O emissions in Slovakia (Gg)



Source: SHMI

Trend in the greenhouse gas emissions - CH₄ from traffic operations compared to total CH₄ emissions in Slovakia (Gg)



Source: SHMI

In terms of transport's share on total emissions of the assessed pollutants for 2009, significant is transport's share on CO emissions – 29%, 50% in case of NO_x and 13% in case of NM VOC. Solid pollutants represented 13% of all emissions in 2009, while the SO₂ emissions showed 0.37%. Transport's share on heavy metal emissions is approximately 8.4%, with copper showing the greatest share on heavy metal emissions by transport (24.0%) followed by zinc (8.1%), and lead (5.6%). Similarly, in case of other heavy metals there was a slight increase in the values of the recorded emissions, compared to the previous year.

In 2009 the CH₄ emissions and N₂O emissions remained at the level of last year. Volumes of CO₂ emissions from transport dropped by 7.2% on a year-to-year basis; however, they grew by 32.6% as of 2000. The biggest contributor to the increase in CO₂ emissions has been road transport - freight vehicles (emissions in 2009 were 2 833.2 thous.tonnes of CO₂) and personal vehicles (in 2009 they represented 2 302.0 thous. tonnes of CO₂ emissions).

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

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

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

Traffic accident rate

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

Trend of traffic accidents in SR

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

Source: Mol SR, SO SR

Agriculture

◆ Economy of agriculture

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

◆ Structure of agricultural land

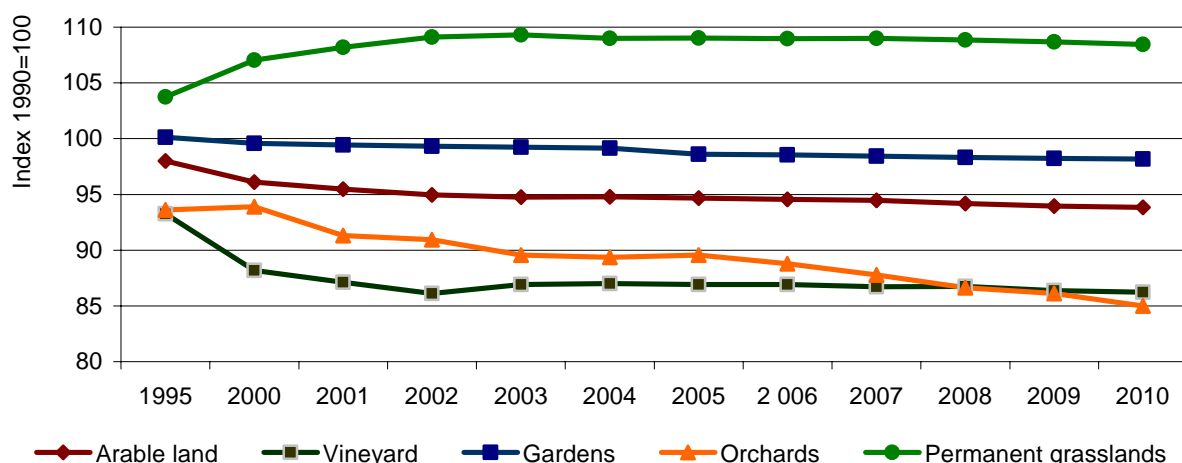
In 2010, **total area of agricultural land in the SR** was 2 414 291 ha. Analysis of the changes to overall values of land types for the year 2010 as compared to 2009 suggests that the **loss of agricultural land** in 2010 (-3 642 ha) when compared with 2009 (-5 545 ha) is smaller by 1 903 ha. Loss of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

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

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

Source: GCCA SR

Agricultural land fund structure after the year 1990



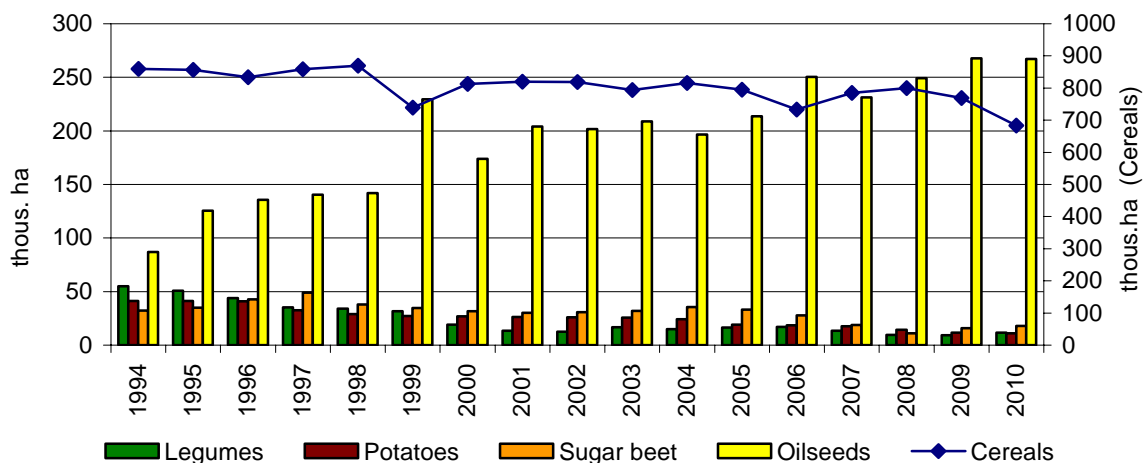
Source: GCCA SR

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

◆ Plant production

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

Harvested areas of agricultural crops



Source: SO SR

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

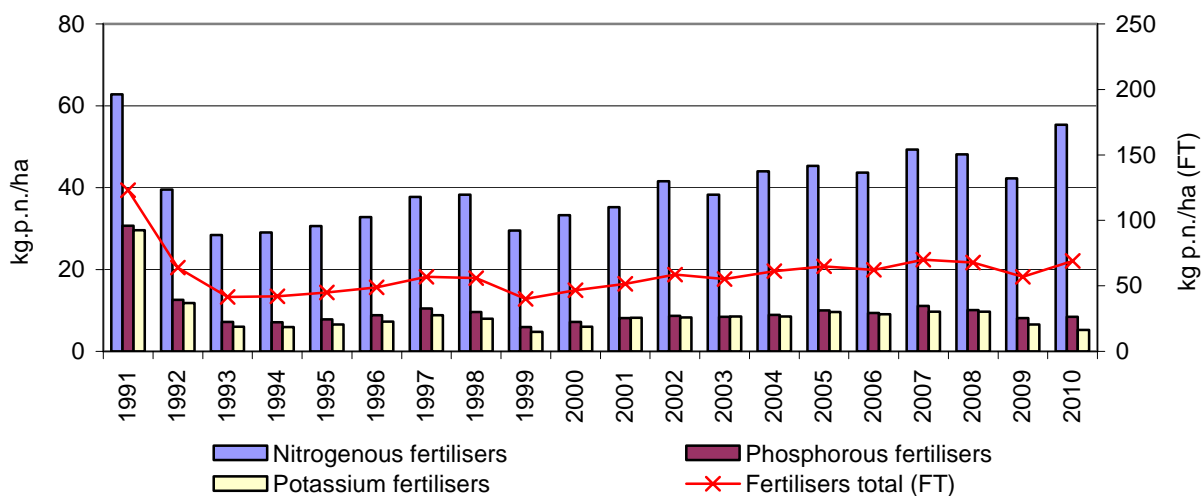
Areas of genetically modified crop in the SR

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

Source: CCTIA

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

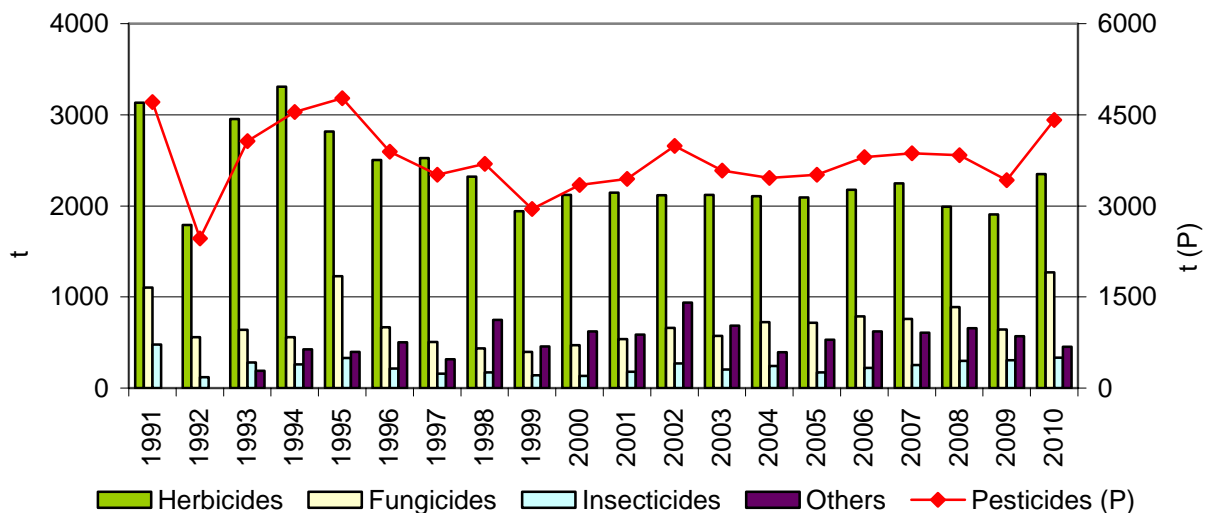
Fertilisers consumption in Slovakia (kg pure nutrient/ha)



Source: CCTIA

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

Pesticides consumption in Slovakia (t)

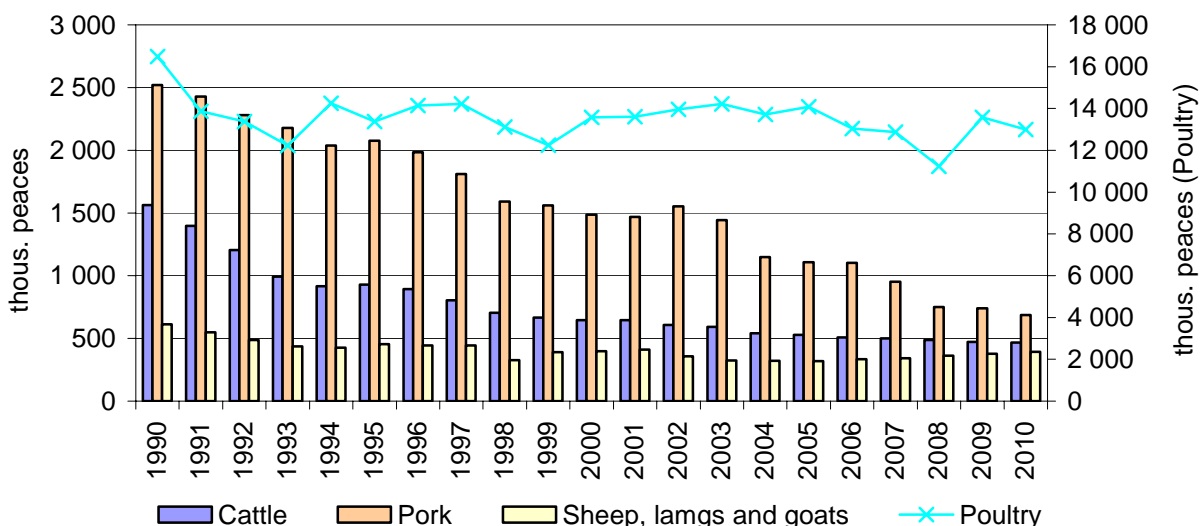


Source: CCTIA

◆ Animal production

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

Number of livestock in Slovakia (thousand peaces)



Source: SO SR

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

◆ Irrigation

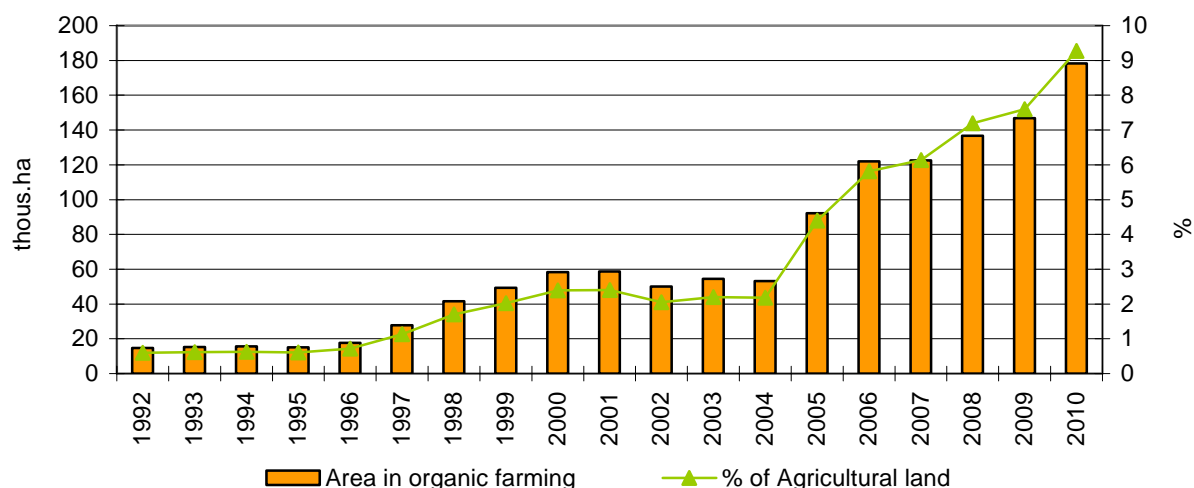
In 2010, 13 642 ha of agricultural land were irrigated, which represents a reduction by 6 706 ha, compared to 2009.

◆ Organic farming

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

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

Trend in the organic farming area



Source: CCTIA

◆ Demand of agriculture on the exploitation of resources

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

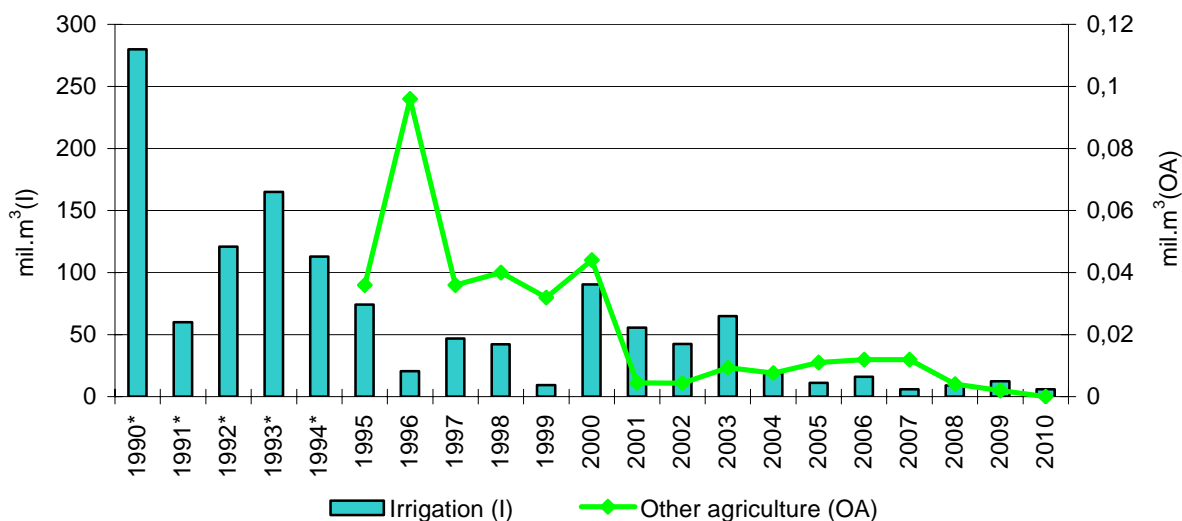
Consumption of selected fuel types, heat, and electricity in agriculture (TJ)

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

Source: SO SR

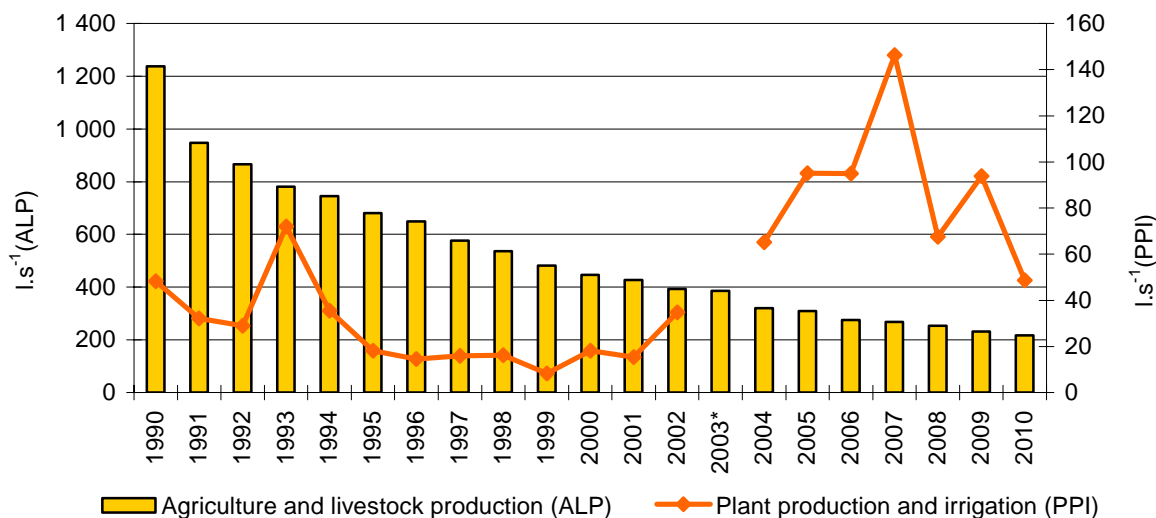
In 2010, there was an overall slight **decrease in the volumes of surface and groundwater** in agriculture.

Trend in surface water use in agriculture



Source: SHMI

Trend in groundwater use in agriculture



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

Source: SHMI

◆ Production of renewable energy from agriculture

The category of biomass for the production of liquid biofuels contains mainly oilseeds and cereals that serve for extracting plant oils, along with their derivatives (e.g. plant oils methyl esters, especially rapeseed oil MERO) and alcohols (ethanol, methanol and their derivatives - methyl-tert-butyl-ether (MTBE), ethyl tert-butyl ether ETBE). The category of biomass for the production of gaseous products contains mainly green carbohydrate forage and livestock excrements. In 2010, there were **17 biogas production facilities** in operation in Slovakia. Biogas was produced from cattle manure at the volume of 17 170.5 thous.m³.

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

Crop type	Area (ha)	Yield of biomass (t/ha)	Production of biomass (t/year)
Thick-sown cereals - total	379 200	4.4	1 668 480
Maize	144 200	9.8	1 413 160
Sunflower	82 944	4.8	398 131
Rapeseed	16 6 476	8.6	1 431 694
Orchards	-	3.9	-
Vineyards	-	2.1	-
Flight from permanent grasslands	-	3.2	-
Total	772 820	-	4 910 000

Source: ATaTI

♦ Impact of agriculture on environment

Agricultural production processes produce greenhouse gases, mainly methane (CH₄), nitrous oxide (N₂O), and less carbon dioxide (CO₂) and halogenated carbohydrates.

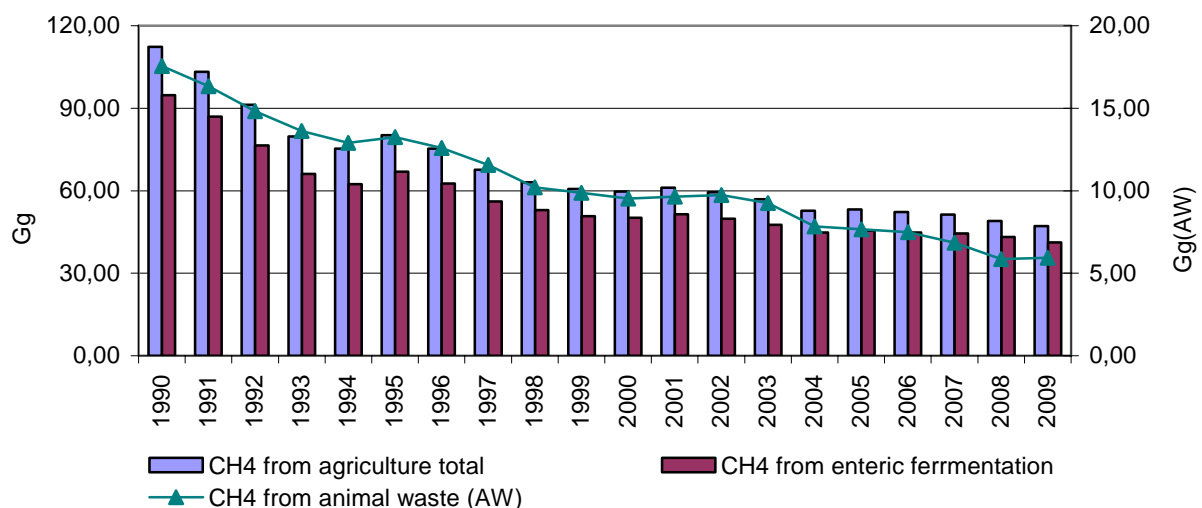
Agriculture belongs to the **biggest producers of methane** (animal production) - large farms of cattle and pork. Methane originates as a direct product of metabolism in herbivores (enteric fermentation) as well as a product of animal excrements breakdown.

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

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

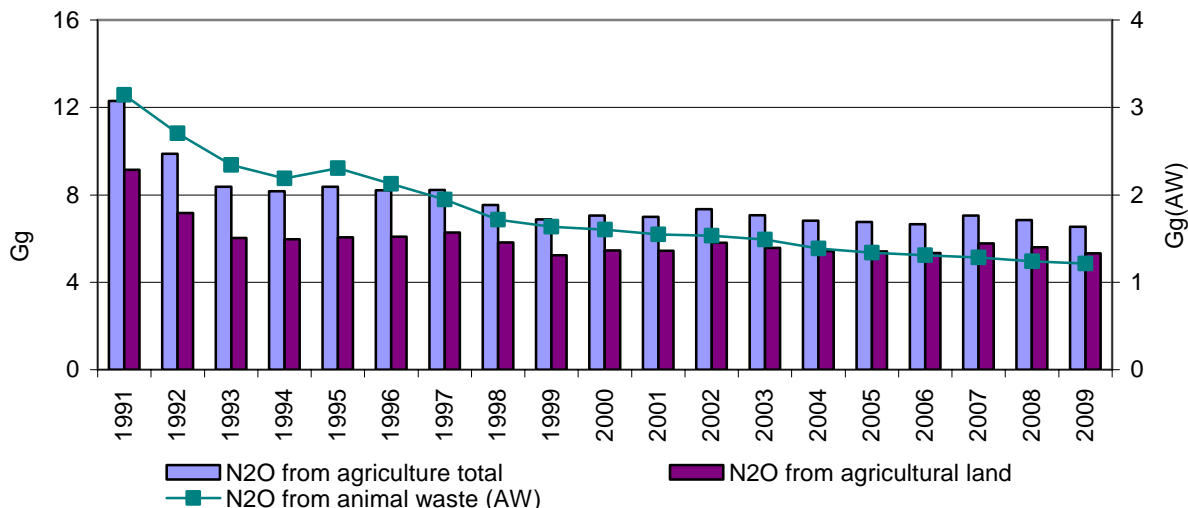
Production of nitrous oxide by agriculture was in most aspects decreasing after 1990. When 6.54 thousand tons of nitrous oxide were produced by agriculture in 2009, the figures decreased by 0.31 tons, compared to 2008.

Trend in methane emissions from agriculture according to type of activity



Source SHMI

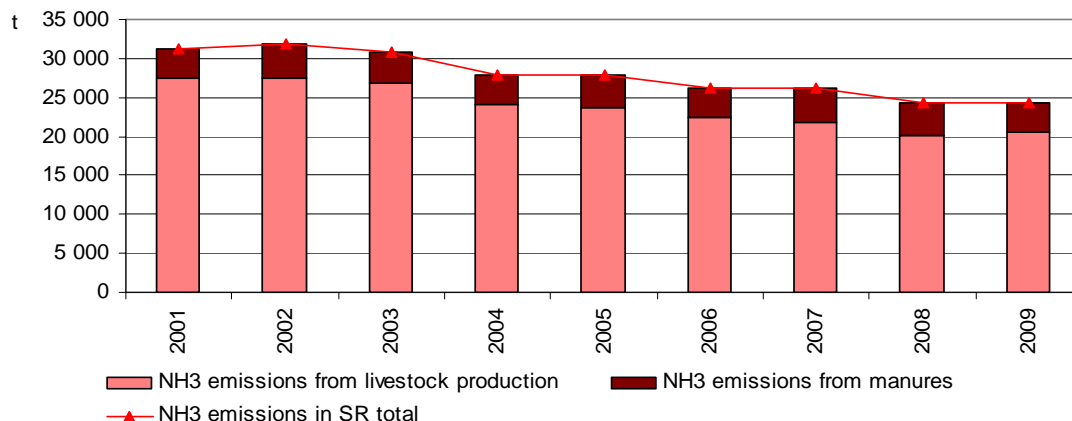
Trend in nitrogen monoxide emissions from agriculture according to type of activity



Source: SHMI

Agriculture is the biggest producer of ammonia (NH₃). Total ammonia emissions in agriculture comprise emissions from livestock production and from agricultural land. **NH₃ emissions show a falling tendency since 1990 in Slovakia.** There were 24 341 t of ammonia produced in agriculture and a reduction by 61 t was recorded from year to year.

Trend in ammonia emissions from agriculture



Source: SHMI

In 2010, the total of 294 899 m³ of waste water related to agricultural production were discharged.

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

Waste water from agriculture	Volume (m ³ .yr ⁻¹)	Insoluble compounds (t.year ⁻¹)	BOD ₅ (t.year ⁻¹)	COD _{Cr} (t.year ⁻¹)
Treated	33.75	0.39	0.96	2.19
Untreated	261.15	0.00	0.00	0.00
Total	294.90	0.39	0.96	2.19

Source: SHMI

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

Forestry

◆ Share of forestry on GDP production

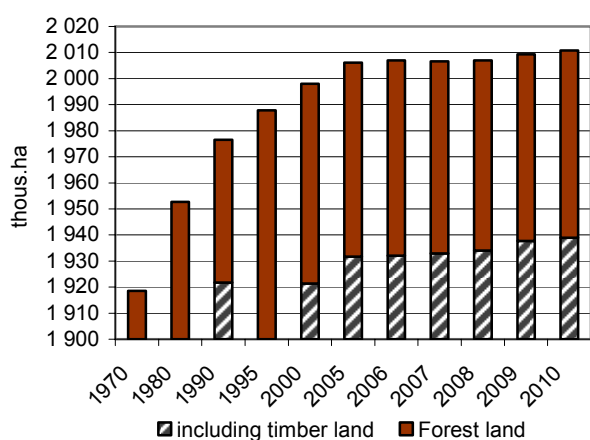
GDP from the forestry in 2010 grew again, after a period of the global crisis aftermath. The GDP value from forestry between years grew by 4.8% in common prices. This has been caused mainly by the reappeared demand for wood, which resulted in growing volumes of deliveries as well as increasing average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

◆ Structure of forest land

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

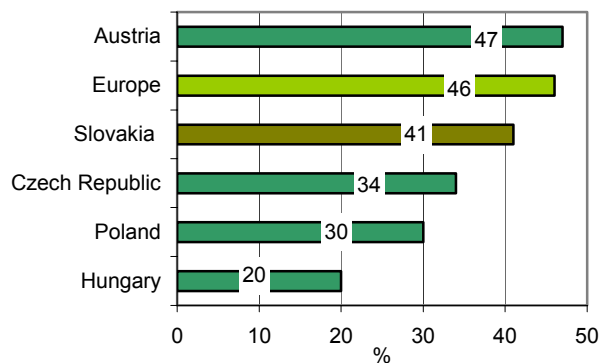
Forest land size in 2010 grew by 1 551 ha, as compared to 2009, which resulted in the growth of forestation in Slovakia by **41%** (2 010 815 ha). Timber land in 2010 represented app. 96.4% (1 938 906 ha) of total size of forest land and similarly, there has been a gradual increase in its size. Calculated to the number of inhabitants, this represents **3.57 km² per 1 000 inhabitants**.

Trend in forest land and timber land



Source: NFC

Comparison of forestation in selected countries

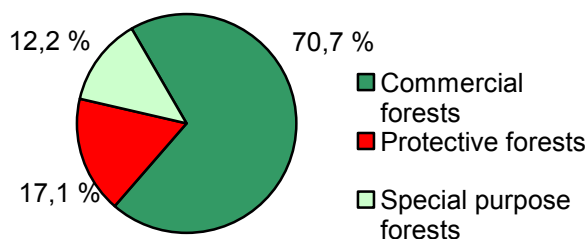


Source: NFC, FAO 2009

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

Due to the increased demand for **public benefit functions of forests**, there was a gradual increase in the size of **protection forests** (from 7.9% in 1960 to the present level of 17.1%, the size is stabilized since recent years) and also **special purpose forests**. Majority of commercial forests belong to poly-functional forests that also have other associated ecological and social functions, while only 9.5% of commercial forests are located in purely production type.

Spatial representation of forest categories in 2010 (%)



Source: NFC

◆ Forest composition by species and age groups

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

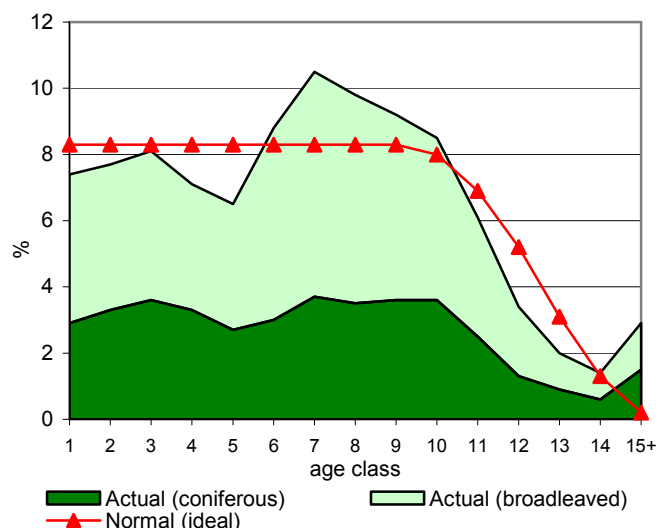
Real **forest age composition** of SR partially differs from the normal (theoretical) one. Clearings take up the area of 9 637 ha. The present age composition shows the middle (6-10) and oldest (15+) age categories above the normal level.

Comparison of present tree species composition in the forest of the SR with original and target-perspective one

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

Source: NFC

Age composition of the forest



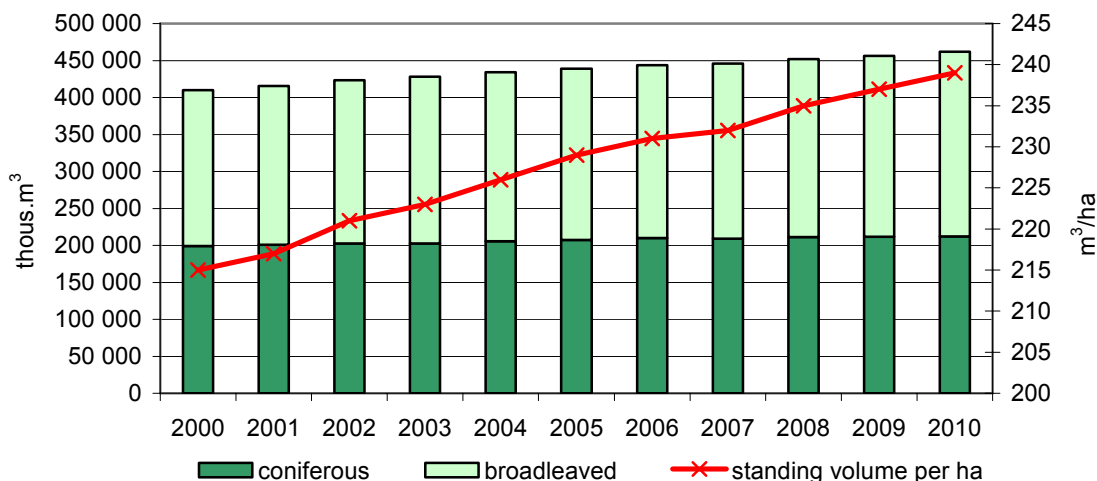
Source: NFC

◆ Forestation and standing volume

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

In the long-term horizon, **standing volume** in the Slovak forests has been on the rise, in 2010 reached **461.9 mil. m³** of barkless wood matter, with average stock per hectare reaching 239 m³. **Total current increment** increase at the present time and reached **11 953 thous. m³** (6.27 m³ per ha).

Trends in total standing volume



Source: NFC

◆ **Timber felling**

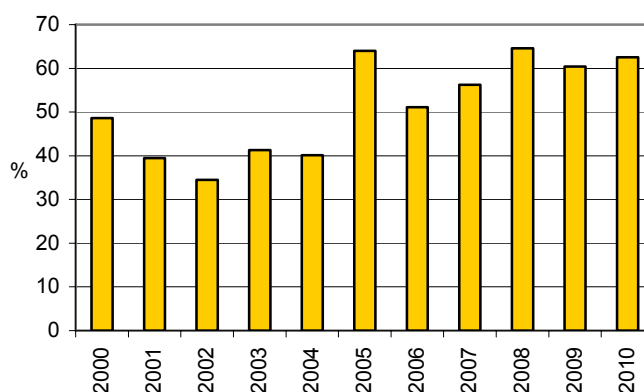
In 2010, timber felling reached **9 859.7 thous. m³**, which is by 611.6 thous.m³ (6.2%) more than in 2009. **Incidental felling** included **62.5 %** of total anticipated harvested timber. Especially, due to high volumes of incidental felling, volumes of total timber felling under forest management plan also in 2010 were exceeded by 20%.

Total volume of timber felling and incidental felling (thous. m³)

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

Source: NFC, SO SR

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



Source: NFC

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

◆ Certification of sustainable forest management

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

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

Number of certified subjects and area of the certified forests

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

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

◆ Injurious agents and forests condition

As a consequence of negative impacts of wind, snow, frost, drought, and unknown **abiotic factors**, there was **2 306.55 thous. m³** of wood matter damaged this year, with more than 87.4% caused by the wind. Processed was 89.3% of the wood matter, with 246.66 thous.m³ remaining unprocessed.

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

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

Forest damage caused by anthropogenic agents (thous.m³)

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

Source: NFC

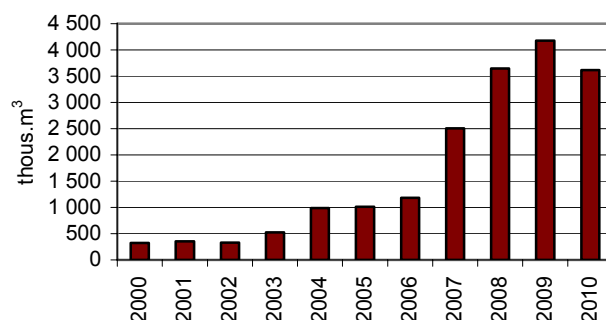
Of the **biotic injurious agents** of forest land, **European spruce bark beetle** is the most significant injurious agent, with more than 95% contribution to total affected wood matter with **bark-beetles and woodworms**.

In 2010, 79.9% of damaged wood matter was thus processed, with 725.1 thous.m³ still unprocessed. Defoliation of forest trees caused by **leaf-eating insects** was not recorded in 2010. Of the **pathogenic fungi**, the most frequent is *Armillaria* that causes most damage to the spruce tree type in the district of Čadca (271.7 thous. m³).

Forest damage caused by biotic injurious agents (m³, ha)

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

Source: NFC, SO SR

Trend of damages caused by bark beetles and woodworms


Source: NFC

◆ Forest condition monitoring and assessments

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

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

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

Results of forest condition monitoring in SR in 1987-2010

Year	Tree types	Representation of trees in various damage degrees in %							
		0	1	2	3	4	1-4	2-4	3-4
1987	Coniferous	11	36	41	11	1	89	53	12
	Broadleaves	26	47	22	5	0	74	27	5
	Total	19	42	32	7	0	81	39	7
1997	Coniferous	13	45	38	3	1	87	42	4
	Broadleaves	22	55	21	2	0	78	23	2
	Total	18	51	28	2	1	82	31	3
2007	Coniferous	5	58	36.1	1.1	0.3	95.3	37.5	1.4
	Broadleaves	19	65	14.9	1.7	0.0	81.5	16.6	1.7
	Total	13	61.8	24.0	1.5	0.1	87.4	25.6	1.6
2008	Coniferous	3	55.9	39.7	1.4	0	97	41.1	1.4
	Broadleaves	15	64.2	20.0	0.8	0	85	20.8	0.8
	Total	10	60.7	28.2	1.1	0	90	29.3	1.1
2009	Coniferous	2.1	55.2	40.7	1.5	0.5	97.9	42.7	2.0
	Broadleaves	14.5	61.0	23.8	0.7	0	85.5	24.5	0.7
	Total	9.3	58.6	30.8	1.1	0.2	90.7	32.1	1.3
2010	Coniferous	6	48	44	2	0	94	46	2
	Broadleaves	12	55	32	1	0	88	33	1
	Total	10	52	37	1	0	90	38	1

Source: NFC

Ratio of trees in the 2-4 degrees of damage is the determining factor for assessment of deterioration or improvement to the health condition of forests, with defoliation greater than 25%.

Description of damage degrees of monitored trees:

- 0 - defoliation of trees between 0 - 10 % no defoliation (healthy trees)
- 1 - defoliation of trees between 11 - 25 % slight defoliation (slightly injured trees)
- 2 - defoliation of trees between 26 - 60 % medium defoliation (medium injured trees)
- 3 - defoliation of trees between 61 - 99 % strong defoliation (strongly injured trees)
- 4 - defoliation of trees between 100 % dying and dead

Assessment of tree defoliation in selected European countries

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

Source: NFC, FAO, 2008

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

◆ Nature protection and forest management

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

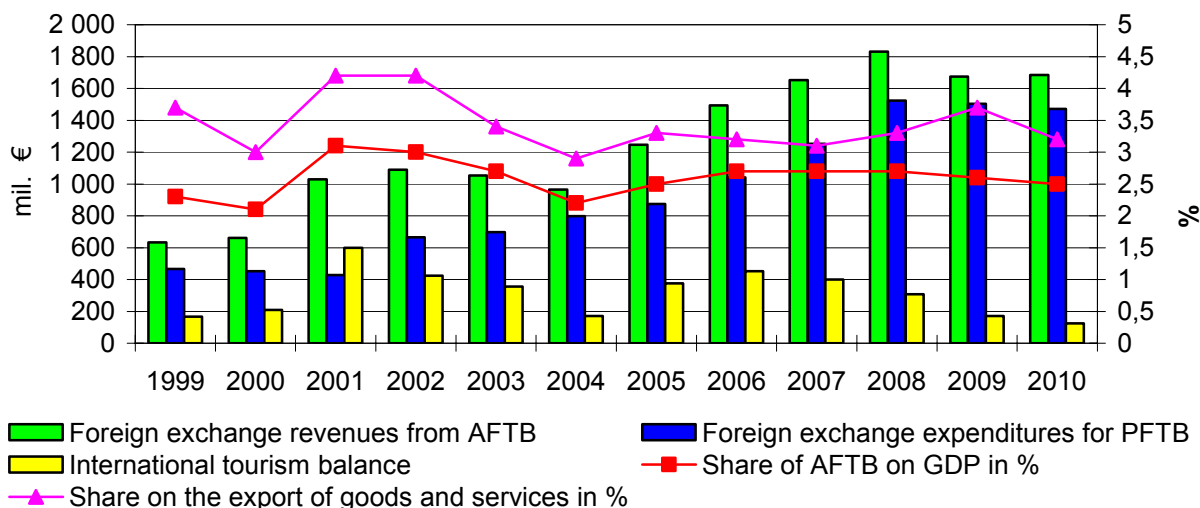
From the view of the area size, there is approximately **53% of forest land classified under the 2nd and higher nature protection degree** (or they are part of the protected area). Such size of protected areas with their related limitations **has an impact on the ownership rights and cause material losses**.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

Recreation and Tourism

◆ Tourism and its contribution to the GDP

Foreign exchange revenues for active foreign tourism balance (AFTB) in 2000 - 2002 were increasing, notwithstanding the fluctuating characteristics of the statistical data. In 2002-2004 there was a reduction due to significant changes outside of the sector (the Slovak crown getting stronger especially in relation to the US dollar and the Polish zloty, an increase to the original GDP rate from 14 to 19%). There was again a very significant increase in revenues from tourism and their share on the GDP and export of goods and services in 2005 - 2008. On the contrary, in 2010, there was recorded a major reduction in revenues and tourism balance, while at the same time there was a significant increase in the **share of tourism on the GDP** and on the export of goods and services. In 2010, there was a very slight increase in revenues and a significant increase in tourism balance, while at the same time there was a slight reduction in the share of tourism on the GDP and a significant reduction in its share on the export of goods and services.

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

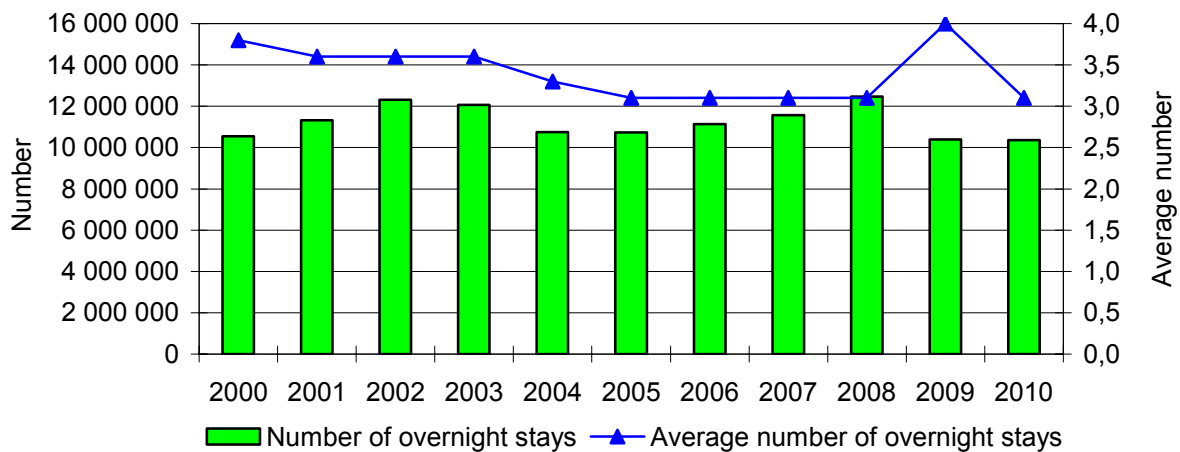


Source: SO SR

◆ Performance of accommodation facilities

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

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



Source: SO SR

◆ Environmental impact of recreation and tourism

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

Continuing increase in the length of erosion-impacted hiking marked trails presents a significant environmental issue. These trails are **in the zone above the upper forest border and in precipices** where, due to extreme climate conditions, exist greatly deteriorated local conditions for regeneration of the soil and the flora. **Critical soil erosion** can be seen at marked trails in the territory of the national parks of the **Low Tatras and Malá Fatra, and the Muránska Plane National Park. In 2004 - 2008, significant increase in erosion of marked hiking trails** was recorded also in the territory of the **Tatras National Park. On the contrary, a rather significant decline in the erosion of tourist marked trails in 2009** was recorded in the territory of the **Pieninský National Park, and a slight decline appeared in the Veľká Fatra National Park.**

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

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